

Integrated Letter Report, Programmatic Environmental Assessment, and
Finding of No Significant Impact

Federal Participation in the Aquatic Plant Control Program for Water Chestnut Management in Maryland, Washington D.C., and Virginia

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U.S. Army Corps of Engineers, Baltimore District

Draft Finding of No Significant Impact

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The U.S. Army Corps of Engineers (USACE), Baltimore District, has conducted an environmental analysis in accordance with the National Environmental Policy Act of 1969, as amended. The Final Programmatic Environmental Assessment (EA), dated XX, for Federal Participation in the Aquatic Plant Control Program for Water Chestnut Management in Maryland, Washington D.C., and Virginia addresses the effectiveness of manual removal, mechanical management, and chemical treatment to manage two species of water chestnut (*Trapa bispinosa* var. *iinumai* and *Trapa natans*) over a broad geographic area in Maryland, Washington D.C., and Virginia.

The Final Programmatic EA evaluates environmental effects and Federal participation in a cost-shared program with the Metropolitan Washington Council of Governments (MWCOG) to manage water chestnut across a broad geographic area, to include Maryland, Washington D.C., and Virginia. Implementation of management measures by MWCOG is proposed to begin in the summer of 2026 and will initially target 42 water bodies within Virginia and Maryland with observations of water chestnut presence. The cost-shared program and treatment of water chestnut under a cost-share agreement will continue into future years as funding is available and work is necessary to manage the spread of these invasive aquatic plants in Maryland, D.C., and Virginia. Infestations that are newly identified for proposed management using the preferred alternative, and located within Maryland, D.C., and Virginia, will be covered by this Programmatic EA. Site or condition-specific Records of Environmental Consideration (RECs) will be prepared as necessary to evaluate the localized environmental effects of water chestnut management activities in those newly identified water bodies.

The preferred alternative includes a suite of management methods that could be used alone or in combination to reduce the populations and spread of these two species of water chestnut, and to enable rapid response to new infestations. Management methods included in the preferred alternative include:

- Manual removal of water chestnut by hand-pulling localized populations of plants, accessed by wading or small boats.
- Mechanical management of water chestnut through the use of mechanical harvesters, such as cutters or hydro-rakes. This method includes cutting, pulling, or tilling to eliminate unwanted vegetation. Mechanical harvesting is most effective in densely invaded areas (>25% water chestnut surface area coverage), where plants are growing in mats.
- Chemical treatment of water chestnut with herbicides registered and licensed for aquatic use by the U.S. Environmental Protection Agency and covered by General Permits for aquatic pesticide use in Maryland, Virginia, and Washington D.C. Herbicides used for treatment will primarily include imazamox, flumioxazin, 2,4-D, trichlopyr, and fluridone; although other licensed herbicides proven effective for water chestnut treatment could be used in future management efforts.

In addition to a “no-action” plan and the preferred alternative, two other alternatives were considered including biological management and water drawdown. These alternatives were

determined to be infeasible or to have significant environmental effects. Therefore, only the no action plan and the preferred alternative plan were carried forward and the potential effects were evaluated under NEPA. A summary assessment of the potential effects of the preferred alternative are listed in Table 1.

Table 1: Summary of potential effects of the preferred alternative.*

	Insignificant effects	Insignificant effects as a result of mitigation	Resource unaffected by action
Aesthetics	☒	☐	☐
Air Quality	☒	☐	☐
Aquatic Resources/Wetlands	☒	☐	☐
Anadromous Fish	☐	☐	☒
Cultural Resources	☐	☐	☒
Fish and Wildlife Habitat	☒	☐	☐
Floodplains	☐	☐	☒
Hazard, Toxic, and Radioactive Waste	☐	☐	☒
Historic Properties	☐	☐	☒
Hydrology	☒	☐	☐
Invasive Species	☒	☐	☐
Land Use	☐	☐	☒
Migratory Birds	☒	☐	☐
Navigation	☐	☐	☒
Noise Levels	☒	☐	☐
Public Infrastructure	☐	☐	☒
Recreation	☒	☐	☐
Socioeconomics	☐	☐	☒
Soils	☐	☐	☒
Submerged Aquatic Vegetation*	☒	☐	☐
Threatened/Endangered Species/Critical Habitat	☒	☐	☐
Tribal Trust Resources	☐	☐	☒
Water Quality	☒	☐	☐
Waterways and Hydrology	☒	☐	☐

*The preferred alternative is the management of water chestnut through manual removal, mechanical management, and chemical treatment.

All practicable and appropriate means to avoid or minimize adverse environmental effects were analyzed and incorporated into the preferred alternative. Application of management methods will be conducted in accordance with permit conditions, label requirements and application instructions, and the appropriate best management practices.

No compensatory mitigation is required as part of the preferred alternative.

Public review of the draft EA and FONSI was completed on **DATE DRAFT EA AND FONSI REVIEW PERIOD ENDED**. All comments submitted during the public review period were incorporated into in the Final EA and FONSI.

Pursuant to Section 7 of the Endangered Species Act of 1973, as amended, USACE determined that the preferred alternative will have no effect on the green floater clam, the small whorled pogonia, or the monarch butterfly. The preferred alternative may affect but is not likely to adversely affect the northern long-eared bat and the tricolored bat. The U.S. Fish and Wildlife Service Virginia Ecological Services Field Office (ESFO) concurred with USACE's determination on February 9, 2026. The Chesapeake Bay ESFO concurred with USACE's determination on February 18, 2026.

Pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended, USACE determined that the preferred alternative has no potential to cause adverse effects on historic properties.

All applicable environmental laws have been considered and coordination with appropriate agencies and officials has been completed.

All applicable laws, executive orders, regulations, and local government plans were considered in evaluation of alternatives.

Based on the EA, the reviews by other Federal, State and local agencies, Tribes, input of the public, and the review by my staff, it is my determination that the preferred alternative would not cause significant adverse effects on the quality of the human environment; therefore, preparation of an Environmental Impact Statement is not required.

Date

Francis B. Pera
Commander and District Engineer
Colonel, U.S. Army

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Appendix A. Hydrologic Subbasin Maps

Appendix B. Environmental and Cultural Coordination

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1 Introduction

The Metropolitan Washington Council of Governments (MWCOCG), along with local and state agencies, is focused on the management of the two-horned water chestnut (*Trapa bispinosa* var. *iinumai*) and Eurasian water chestnut (*Trapa natans*), invasive aquatic plants, throughout Maryland, Virginia, and Washington, D.C. The U.S. Army Corps of Engineers (USACE), Baltimore District proposes to enter a cost-shared program under the USACE Aquatic Plant Control Program (APCP) to aid MWCOCG (the non-Federal Sponsor) with the management of these invasive species.

Eurasian water chestnut was first identified in the 1800s and its spread has been problematic throughout the region, including in the Potomac River. The two-horned water chestnut, first identified in the United States in 2014 in Virginia's Potomac River, was initially mistaken for the Eurasian water chestnut (*Trapa natans*). However, subsequent analysis confirmed it as a distinct species native to Taiwan, Japan, China, and Korea. The plant's hard, spiny seed pods are notorious for adhering to waterfowl, boats, nets, clothing, and construction equipment. It has been documented in several counties in Virginia and Maryland, including in counties close to Washington, D.C.

In late May, the two-horned water chestnut's triangular, serrated leaves begin to emerge on the water's surface, forming rosettes. These floating leaves are green on top and reddish underneath. The plant's roots can anchor into the sediment in water up to 15 feet deep, and its stems contain air pockets that aid in buoyancy. By June, light pink flowers bloom in the center of each rosette and develop into two-horned seed pods. The plant dies back after the first frosts, typically in November, but its seeds can remain viable in sediment for at least two years.

Water chestnut forms dense mats on the water's surface, limiting sunlight, suppressing the growth of native aquatic plants, and reducing oxygen exchange. These effects contribute to declining water quality and threaten aquatic life. The plant spreads rapidly and can dominate habitats, negatively impacting recreational activities such as boating, fishing, and swimming.

This Programmatic Environmental Assessment (EA) evaluates a suite of management measures designed to manage and reduce the spread of water chestnut. Management measures considered for these species include mechanical harvesting, manual removal, biological management, water level drawdowns, and use of chemical herbicides. The Federal Action for this EA is to cost-share a program with the MWCOCG to manage water chestnut through a combination of efforts, including manual removal, mechanical removal, and treatment with chemical herbicides. To prevent regional infestation, the work included within the cost share will include two-horned water chestnut and Eurasian water chestnut, since effective management methods are similar, and these species occur in water bodies with similar environmental conditions.

This Programmatic EA evaluates the potential environmental effects of water chestnut (*Trapa bispinosa* and *Trapa natans*) management measures across a broad geographic scope, to include Maryland, Washington D.C., and Virginia. MWCOCG is a member of the National Capital Partnership for Regional Invasive Species Management (PRISM). PRISM was created to coordinate the cross-boundary efforts to manage invasive species. As such, MWCOCG coordinates outreach, monitoring, and control efforts for water chestnut across the states included in this Programmatic EA. The states included within this EA, also cross jurisdictional boundaries for USACE Civil Works Districts, including Baltimore District, Norfolk District,

Wilmington District, Nashville District, Pittsburgh District, and Huntington District. USACE Baltimore District is managing this Program on behalf of and in coordination with these Districts.

Implementation of management measures is proposed to begin in the summer of 2026 and will initially target 42 water bodies within Virginia and Maryland with observations of water chestnut presence. The cost-shared agreement and treatment of water chestnut under the agreement will continue into future years as funding is available and work is necessary to manage the spread of these invasive aquatic plants in Maryland, D.C., and Virginia. Infestations that are newly identified for proposed management using the preferred alternative identified herein, and located within Maryland, D.C., and Virginia, will be covered by this Programmatic EA. Site or condition-specific Records of Environmental Consideration (RECs) will be prepared as necessary to evaluate the localized environmental effects of water chestnut management activities in those newly identified water bodies.

1.1 Program Authority and Guidance

Under Section 104 of the River and Harbor Act (RHA) of 1958 (33 United States Code [U.S.C.] §610), as amended, the USACE is authorized to carry out a comprehensive program for the prevention, management, and progressive eradication of noxious aquatic plants and aquatic invasive species in waters of the United States. This authority supports the implementation of the APCP, which receives annual congressional appropriations.

It is USACE policy that the APCP addresses aquatic plant infestations that are of major, or potentially major, economic significance. These efforts apply to navigable waters, tributaries, streams, connecting channels, and all allied waters.

Specific guidance for developing cost-sharing agreements, conducting planning studies, and preparing funding requests is provided in Chapter 14 of Engineer Pamphlet 1130-2-500.

The proposed program would be implemented pursuant to this authority, in accordance with the following applicable USACE policy and guidance:

- Department of Army, Office of the Assistant Secretary, Civil Works, Policy Memo., U.S. Army Corps of Engineers Invasive Species Policy Memo (21 February 2023)
- National Invasive Species Management Act (16 U.S.C. § 4701)
- United States Department of the Army Invasive Species Strategic Plan (2024)
- Section 104 of the River and Harbor Act of 1958 (as amended)
- Section 103(c)(6) of WRDA 1986 (P.L. 99-662)
- Executive Order 13751, Invasive Species
- ER 1105-2-103, Chapter 6
- Applicable USACE Invasive Species Policies and Guidance

1.2 Program Area and Scope

The location of the proposed action to be implemented by MWCOC and its partner jurisdictions is within the State of Maryland, Commonwealth of Virginia, and the District of Columbia. As the

non-Federal Sponsor for this cost-shared program, MWCOG is representing state and local agencies within portions of Maryland and Virginia where water bodies have been identified as containing occurrences of two-horned water chestnut (*Trapa bispinosa*) and Eurasian water chestnut (*Trapa natans*). Eurasian water chestnut occurs throughout the region, although eradication efforts in some areas of Virginia have been successful. Two-horned water chestnut is currently limited mainly to a few large populations around the Washington D.C. Metropolitan Area. Jurisdictions currently affected by two-horned water chestnut are shown in Figure 1-1, but this Programmatic EA covers future infestations that could occur via spread of this invasive species within Maryland, Virginia, and the District of Columbia.

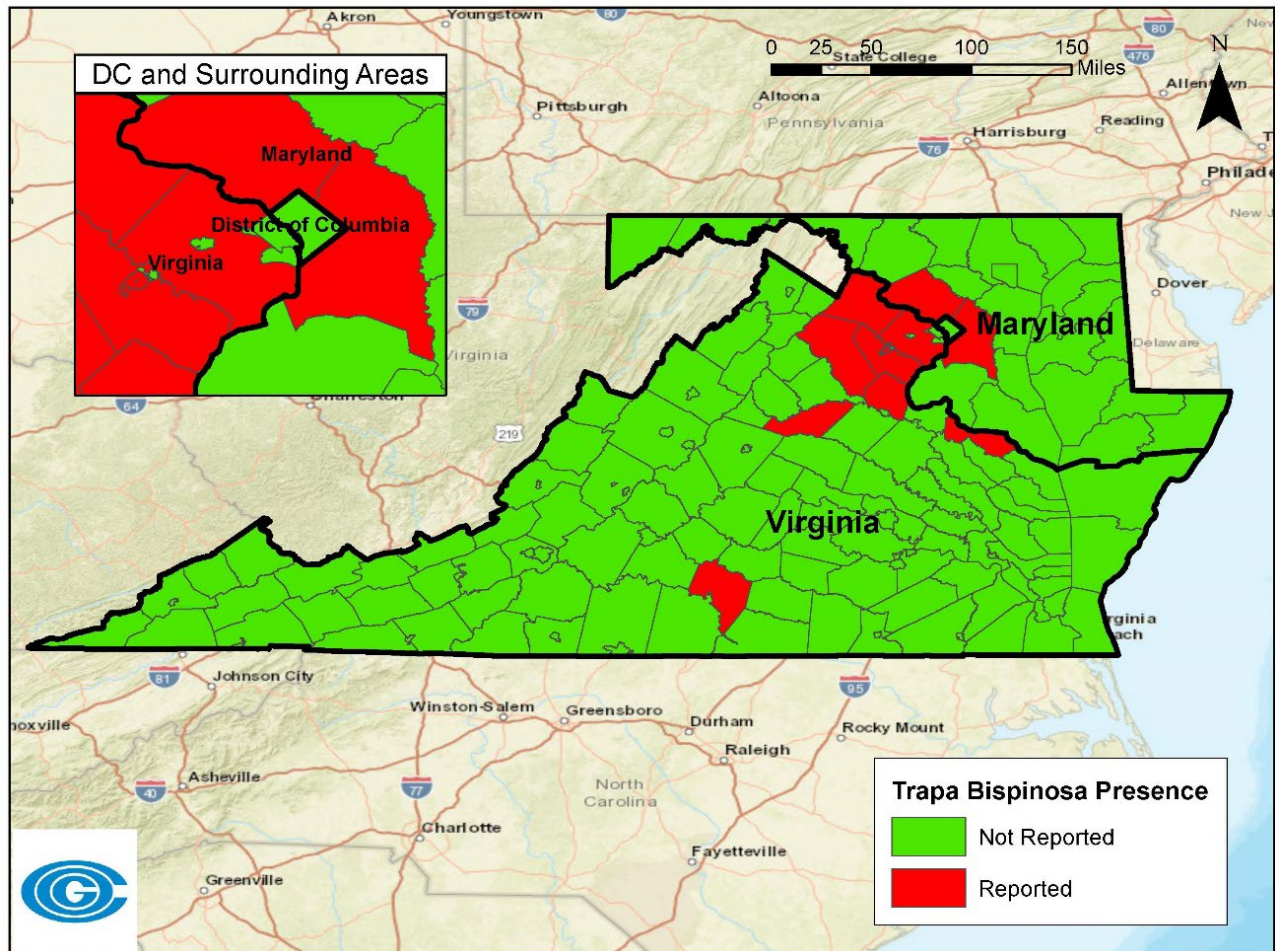


Figure 1-1: Study area and presence of two-horned water chestnut by County.

Table 1-2 and Figure 1-2 show the specific water bodies that are proposed to be targeted for water chestnut management in the summer of 2026, and the documented number of occurrences by the U.S. Geological Survey (USGS) within those hydrologic basins. Future management efforts may occur annually within other water bodies in Maryland, Virginia, and/or the District of Columbia, and will be identified in a Work Plan prepared by MWCOC and provided to USACE, Baltimore District. Future management efforts in this region that use the same methods identified within the proposed action for this Programmatic EA, will be covered by this EA. For these actions, a REC will evaluate site specific impacts to threatened and endangered species and cultural resources at newly identified sites. If removal or treatment methods are proposed that are not included in the proposed action within this Programmatic EA, a separate National Environmental Policy Act (NEPA) document will be generated to consider environmental impacts from these actions.

Table 1-2: Water bodies targeted for proposed management efforts in summer 2026 and documented number of occurrences within those watersheds.

Watershed (HUC8)	County, State	Species	No. of occurrences documented ¹	No. of Sites to be Managed
Chester-Sassafras (02060002)	Cecil County, MD	<i>T. natans</i>	0	1
Gunpowder-Patapsco (02060003)	Harford County, MD	<i>T. natans</i>	33	2
Middle Potomac-Anacostia-Occoquan (02070010)	Fairfax County, VA	<i>T. bispinosa</i>	235	18
Middle Potomac-Anacostia-Occoquan (02070010)	Fauquier County, VA	<i>T. bispinosa</i>	30	2
Middle Potomac-Anacostia-Occoquan (02070010)	Manassas City, VA	<i>T. bispinosa</i>	10	5
Middle Potomac-Anacostia-Occoquan (02070010)	Prince Georges County, MD	<i>T. bispinosa</i>	39	2
Middle Potomac-Anacostia-Occoquan (02070010)	Prince William County, VA	<i>T. bispinosa</i>	60	5
Middle Potomac-Catoctin (02070008)	Fairfax County, VA	<i>T. bispinosa</i>	51	3
Middle Potomac-Catoctin (02070008)	Loudon County, VA	<i>T. bispinosa</i>	3	1
Rivanna (02080204)	Albemarle County, VA	<i>T. bispinosa</i>	0	1
Rapidan-Upper Rappahannock (02080103)	Orange County, VA	<i>T. bispinosa</i>	4	2

¹USGS, 2025a and 2025b. Some occurrences are newly identified and not yet reflected in the USGS database.

Under the APCP, cost-shared management of aquatic invasive plant species cannot be provided for management of species in waters that are not publicly accessible nor are Waters of the U.S. or adjacent to Waters of the U.S. Waters of the U.S. are defined under 33 CFR 328.3. All water bodies were screened to ensure that these cost-share criteria were met.

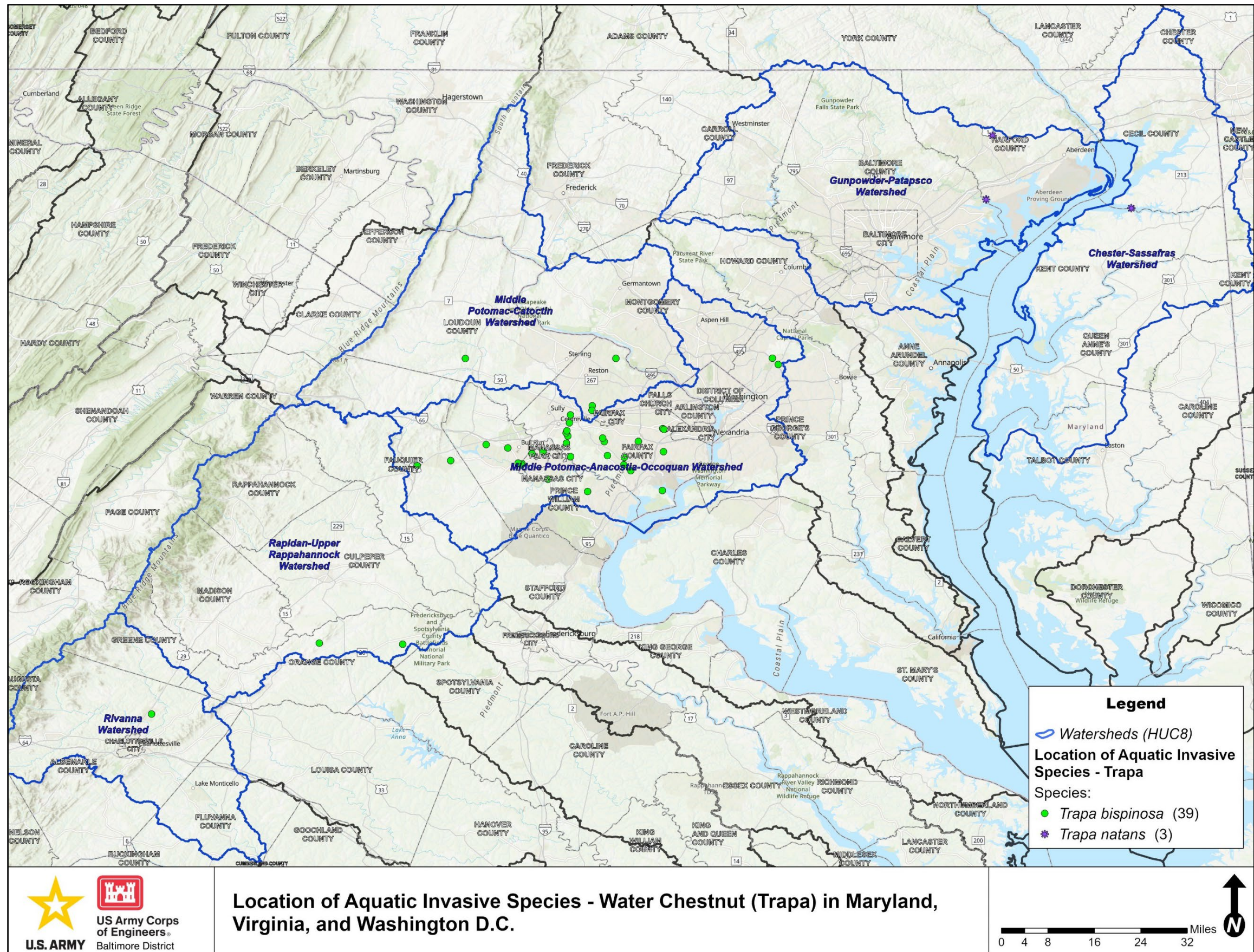


Figure 1-2: Locations targeted for proposed management efforts in summer 2026.

2 Purpose and Need of the Proposed Action

2.1 Background

Invasive aquatic plants are plant species that are considered non-native to an aquatic ecosystem and once established cause economic, human health, and/or environmental harm. Eurasian water chestnut, *Trapa natans*, was first recorded in Massachusetts in 1859 and in the Chesapeake Bay Watershed (Potomac River) in 1923, as a two-acre patch. By 1933, this small patch had expanded to 10,000 acres of dense beds extending from Washington, DC to Quantico, VA, resulting in a massive removal effort by USACE from 1939 to 1945, with additional actions until at least 1965 (MDDNR, 2025). Since then, local and state jurisdictions have conducted extensive management efforts, working with private landowners, non-profit organizations, and Federal agencies to identify and manage water chestnut. USDA Animal and Plant Health Inspection Service (APHIS) has identified water chestnut as a high-risk invasive plant due to its ability to form dense mats, outcompete native species, and impact recreational activities.

The two-horned water chestnut, *Trapa bispinosa*, was first identified in the U.S. in the tidal Potomac River in Pohick Bay, Lorton, Virginia in 2014. *Trapa bispinosa* was first identified in Maryland in the summer of 2022. Originally misidentified as *Trapa natans*, morphological and DNA analysis confirmed these Mid-Atlantic populations to be genetically distinct from its congener. Native to Taiwan, Japan, China, and Korea, two-horned water chestnut represents a new species introduction of water chestnut into the U.S. (Chorak et. al, 2019). To combat the spread of this new species, early detection and rapid response is required.

Although management efforts have been successful, Eurasian water chestnut still occurs throughout the region and ranges from Virginia to Maine. Two-horned water chestnut now occurs in several counties within the freshwater tributaries of the Chesapeake Bay (Virginia and Maryland) and the Roanoke River Basin (Virginia) where it demonstrates rapid growth competing for available resources and forming dense surface mats of floating rosettes that shade and outcompete native submerged aquatic vegetation. Water chestnut tolerates varied water conditions but prefers eutrophic (rich in nutrients that causes depletion of dissolved oxygen) waters and is able to germinate across a wide range of pH between 4.2 to 8.3 (Hummel & Kiviat, 2004). As an annual species, two-horned water chestnut flowers in June and within 30 days negatively buoyant mature fruits form on floating rosettes that fall to the substrate (Poudel et. al, 2023). Unlike Eurasian water chestnut, seeds do not require dormancy but can over-winter and germinate the following growing season.

Both *Trapa* species possess similar invasive traits that degrade aquatic habitats by altering biodiversity and ecosystem function. Increased growth and competitive ability shift species richness and dominance, thereby altering native submerged aquatic vegetation (SAV) community composition and associated biota. Seasonal senescence of water chestnut drives hypoxia through rapid decomposition of large stands of vegetation, and erosion occurs due to loss of belowground biomass (roots) anchoring sediments. Large spiny fruits and seeds capable of puncturing skin are easily mobile by clinging to animal fur or feathers, clothing, and boating and fishing gear (ropes, nets, boat trailers). Waterfowl (specifically geese) are likely the primary vectors for spread of two-horned water chestnut. Several days (depending on temperature) are required for seeds to desiccate and die thereby increasing the chances of viable seeds traversing watersheds. Left unmanaged, affected water bodies not only continue to degrade fisheries but also serve as a source for the spread of water chestnut, facilitating its invasion.

In addition to environmental impacts, water chestnut poses a substantial threat to infrastructure and navigation. Dense mats of plants can block water intakes, pipes, and other water-related infrastructure. Floating rafts of these invasive plants can restrict navigation channels and cause challenges to boats traversing the water body by interfering with boat propellers.

2.2 Purpose and Need

The purpose of the proposed action is to manage the introduction, spread, and impacts of the invasive aquatic plant species *Trapa bispinosa* (two-horned water chestnut) and *Trapa natans* (European water chestnut) within the waters of Maryland, Virginia, and the District of Columbia.

The proposed action is needed because dense, floating mats of *Trapa* are degrading aquatic ecosystems and impeding water-based activities. Without intervention, there is high risk that infestations will spread to nearby waterways, increasing the risk of invasive species dispersal. Implementing a management program reduces this risk and minimizes damages.

These infestations cause a variety of ecological and economic problems that require management:

- **Ecological and Water Quality Degradation:** The thick vegetation mats block sunlight required by native SAV. This loss of SAV reduces critical food sources and habitat for fish and waterfowl. Furthermore, the decomposition of large quantities of *Trapa* depletes dissolved oxygen in the water, which can stress aquatic life and lead to fish kills.
- **Impairment of Recreation:** The dense surface growths obstruct waterways and navigation, making recreational activities such as boating, fishing, and swimming difficult, and in some cases, impossible.
- **Public Safety Hazards:** The sharp, spiny seeds can wash ashore and create a hazard, causing painful injuries to people and pets.
- **Economic Costs:** Unmanaged infestations can lead to significant economic impacts, including decreased property values adjacent to infested waters and high costs associated with ongoing management efforts. The dense aquatic vegetation can interfere with commercial navigation by clogging vessel propellers and potentially damaging or obstructing waterway infrastructure such as docks, locks, or hydropower facilities.

3 Existing Conditions

This section provides general information about the environmental conditions within the study area, which, as described in Section 1.2, includes water bodies within Maryland, Washington D.C., and Virginia where water chestnut has been reported. This EA assesses the environmental conditions for specific resources that are currently or are most likely to be affected by the proposed action. The scope of this assessment is based on existing areas with reported water chestnut, and the level of detail is generalized to be appropriate for a programmatic review.

3.1 Hydrology

Water chestnut typically inhabits slow moving water bodies such as ponds, lakes, and slow-moving streams. Many of the identified locations for water chestnut are irrigation ponds or stormwater impoundments, some of which are not eligible for work under this cost-shared program because they are not waters of the U.S. or adjacent to waters of the U.S. or are not publicly accessible.

Eurasian water chestnut occurs throughout the region, primarily in the Potomac River watershed in Maryland and Virginia, the Bird River (Gunpowder-Patapsco watershed; HUC 8 02060003) in Baltimore County, Maryland, and the Sassafras River (Chester-Sassafras watershed; HUC 8 02060002) in Cecil County, Maryland. Both the Gunpowder-Patapsco and Chester-Sassafras watersheds drain into the Chesapeake Bay, as does the Potomac River watershed discussed below.

The large majority (over 80 percent) of the locations currently documented as affected by two-horned water chestnut are within the Middle Potomac-Anacostia-Occoquan watershed (Hydrologic Unit Code 02070010) in Virginia, with other populations located in Prince George's County, Maryland (see Table 1-1) (USGS, 2025a). Historically, Eurasian water chestnut heavily infested this area. Management and eradication efforts have been successful, but populations still occur along the Potomac River from Washington D.C. south to Mason Neck. The Middle Potomac-Anacostia-Occoquan watershed is dominated by the Potomac River and tributaries, primarily the Anacostia and Occoquan Rivers, which drain into the Potomac River. Other impacted watersheds include the Middle-Potomac-Catoctin in Maryland and Virginia, and the Lower Potomac, the Rapidan-Upper Rappahannock, the Pamunkey, and the Middle Roanoke in Virginia. Ultimately, all these locations drain into the Chesapeake Bay, except for the Roanoke River which discharges into the Albermarle Sound, located behind the barrier islands of the outer banks of North Carolina.

Water chestnut is anticipated to inhabit water bodies within Coastal Plain or Piedmont Physiographic Provinces but is less likely to occur in areas with steeper slopes and faster moving water flow.

3.2 Water Quality

3.2.1 Maryland

The program area encompasses numerous rivers, streams, lakes, and coastal waters that serve a variety of uses, including fishing, boating, drinking water supply, agriculture, and manufacturing. In Maryland, water quality standards are set by the Maryland Department of the

Environment (MDE). Water quality standards are set in accordance with the Federal Water Pollution Control Act as amended, more commonly known as the “Clean Water Act” (33 U.S.C. §§1251-1387), and state agencies report compliance to the U.S Environmental Protection Agency (USEPA). Water bodies that do not meet water quality standards are reported in Maryland’s Section 303(d) listing for impairment. States are required to develop Total Maximum Daily Loads (TMDLs) for impaired water bodies. A TMDL is a calculation of the maximum amount of a pollutant that a water body can receive and still meet water quality standards.

Eurasian and two-horned water chestnut occur in the Middle Potomac-Anacostia-Occoquan HUC 8 watershed (see Table 1-1). The Anacostia River mainstem and tributaries (MD Basin # 02140205) have been variously designated as Use Class I, II, III, and IV waters, which include (Code of Maryland Regulations [COMAR] 26.08.02.08 O):

- Class I: Water Contact Recreation and Protection of Non-Tidal Warm Water Aquatic Life: The minimum standard for all waters throughout the State; protects waterways for recreation, fishing, and aquatic life use.
- Class II: Support of Estuarine and Marine Aquatic Life and Shellfish Harvesting: Protected for shellfish harvesting and consumption.
- Class III Non-Tidal Cold Water: Protected to maintain natural trout populations.
- Class IV: Recreational Trout Waters: Protected for put-and-take trout fishing.

Note: All of the above categories can have a “P” designation if also used for Public Water Supply.

In Prince George’s County, surface waters are classified as Use I, III, and IV.

Eurasian water chestnut also occurs in the Bird River and Sassafras River in Maryland. The Bird River in the Gunpowder-Patapsco watershed, where Eurasian water chestnut occurs, has a Use IV designation in non-tidal streams, along with a small portion with Use I designation. The tidal areas of the watershed are within Use II. The Bird River has a TMDL for PCBs, based on polychlorinated biphenyls (PCBs) concentrations in fish tissue, first recognized in 2006 (Baltimore County, 2017). The Sassafras River is listed by USEPA as federally impaired waters and the State of Maryland 303(d) as impaired for nutrients, sediment (total suspended solids) and PCBs in the tidal portions as well as biological impairment in the non-tidal portions (Sassafras River Association, 2009).

3.2.2 Virginia

In Virginia, the Virginia Department of Environmental Quality (VADEQ) regulates water quality. Virginia waters are designated for the following uses:

- I: Recreational uses, such as swimming and boating,
- II: Propagation and growth of a balanced, indigenous population of aquatic life, including game fish,
- III: Wildlife
- IV: Production of edible and marketable natural resources, e.g., fish and shellfish

The Middle Potomac watershed of Virginia is heavily urbanized. Water and habitat quality in water bodies in this watershed are generally fair to poor due to nutrient levels, sedimentation, and poor water clarity. Water quality in the Potomac River estuary is affected by three major water pollution inputs: wastewater treatment plant discharges into the river; stormwater runoff and other non-point discharges from urban development; and water flowing from the non-tidal portion of the river into the Potomac River estuary, which is impacted by agriculture (MWCOG,

2019). The Lower Potomac basin has lower population density and more agricultural and forested land use. Water quality is fair due to moderate nutrient levels, high algal density and poor water clarity. The Occoquan Watershed encompasses four counties, including Fairfax, Fauquier, Loudoun, and Prince William. Rural land uses such as agriculture, pasture, and forest predominate, with urban land use accounting for about 27 percent of the watershed area. As such, nutrient loads into the watershed cause eutrophic conditions in water bodies in the Occoquan watershed (Virginia Tech, 2021).

3.2.3 Washington D.C

In Washington D.C., the Department of Energy and Environment sets water quality standards and designations for recreation, protection of aquatic resources, consumption of fish and shellfish, and navigation.

It is expected that water chestnut may spread throughout these areas. Water quality throughout Virginia, Maryland and Washington D.C. varies throughout the region. Adjacent point and nonpoint pollution sources will have an impact on water quality within the region.

3.3 Wetlands

Executive Order 11990 and 33 CFR § 328.3(b) define wetlands as “those areas that are inundated or saturated by surface or ground water at a frequency sufficient to support a prevalence of vegetative or aquatic life that requires saturated or seasonally saturated conditions for growth and reproduction.” Maryland Department of Natural Resources (MDNR) and VADEQ regulate activities impacting wetlands and classifies wetlands as tidal or nontidal wetlands. Nontidal wetlands are not influenced by the tides, with water derived from precipitation, surface, or groundwater. In Maryland, there are an estimated 757,000 acres of mapped vegetated wetlands. Most of these wetlands are palustrine wetlands which include forested, shrub, and emergent tidal and nontidal wetlands, as well as bogs, fens, and vernal pools. In 2010, estuarine vegetated wetlands comprise about 240,000 acres (MDE, 2021).

The Middle Potomac watershed in Maryland and Virginia, where most of the two-horned water chestnut populations currently exist, is well developed, but includes scattered wetlands along creeks and tributaries of the Potomac River. Wetlands in the region include palustrine forested and emergent wetlands, tidal fresh marsh, and brackish high marsh. Where Eurasian water chestnut occurs within the Sassafra River basin within Kent County and in Baltimore County, occurrences are in small embayments or tributaries of the main river. Wetlands occurring here include estuarine and marine wetlands, freshwater emergent wetlands, and freshwater forested/shrub wetland. In addition to providing food and habitat for wildlife, water quality improvements, flood storage, and recreational opportunities, wetlands act as natural buffers that reduce risk to inland communities from flooding and erosion.

Potential impacts to wetlands are documented in Section 5.3.3.

3.4 Aquatic Vegetation

Aquatic vegetation in water bodies within the region consists of submerged, emergent, and floating plant species, which contribute to these waters' overall productivity and ecological health. Plant communities are influenced by factors such as water depth, nutrient levels, and seasonal fluctuations in water levels. Common native species found in water bodies in this

region include various types of submerged plants such as the Canadian waterweed (*Elodea canadensis*), leafy pondweed (*Potamogeton foliosus*), and American lotus (*Nelumbo lutea*), as well as emergent vegetation like cattails (*Typha* spp.), American water willow (*Justicia americana*), smartweeds (*Persicaria* spp.), arrow arum (*Peltandra virginica*), bur-reed (*Sparganium americanum*), and bulrushes (*Schoenoplectus* spp.). Floating species such as duckweed (*Lemna* spp.) may be present, particularly during periods of high nutrient availability (VADWR, 2025a). These aquatic plants play a critical role in providing habitat for aquatic organisms, stabilizing sediments, and helping to regulate nutrient cycling. Table 3-2 shows aquatic vegetation that could potentially occur in water bodies within the region.

Table 3-2: Potential macrophytes and cyanobacterium within water bodies in the region; OBL = obligate; FACW = facultative wetland.

Scientific name	Common name	Habit	Wetland Status	Native status
<i>Asclepias incarnata</i>	Swamp milkweed	Emergent	OBL	Native
<i>Carex frankii</i>	Frank's Sedge	Emergent	OBL	Native
<i>Cephalanthus occidentalis</i>	Common buttonbush	Shrub	OBL	Native
<i>Elodea canadensis</i>	Canadian waterweed	Submerged	OBL	Native
<i>Hydrilla verticillata peregina</i>	Wandering hydrilla	Submerged	OBL	Non-native
<i>Iris pseudacorus</i>	Yellow iris	Emergent	OBL	Non-native
<i>Justicia americana</i>	American water-willow	Emergent	OBL	Native
<i>Lepidium virginicum</i>	Virginia pepperweed	Emergent	OBL	Native
<i>Ludwigia peploides</i>	Floating Primrose-Willow	Emergent	OBL	Native
<i>Microseira wollei</i>	Lyngbya	Submerged	OBL	Non-native
<i>Myriophyllum aquaticum</i>	Parrot's feather	Submerged	OBL	Non-native
<i>Najas minor</i>	Brittle naiad	Submerged	OBL	Non-native
<i>Nelumbo lutea</i>	American lotus	Floating-leaved	OBL	Native
<i>Onoclea sensibilis</i>	Sensitive Fern	Emergent	FACW	Native
<i>Peltandra virginica</i>	Green arrow arum	Emergent	OBL	Native
<i>Persicaria spp.</i>	Smartweeds	Emergent	OBL	Native
<i>Platanus occidentalis</i>	American sycamore	Tree	FACW	Native
<i>Potamogeton foliosus</i>	Leafy pondweed	Submerged	OBL	Native
<i>Rosa palustris</i>	Swamp rose	Shrub	OBL	Native
<i>Sambucus canadensis</i>	American Black Elderberry	Shrub	FACW	Native
<i>Schoenoplectus spp.</i>	Bulrushes	Emergent	OBL	Native
<i>Sparganium americanum</i>	American bur-reed	Emergent	OBL	Native
<i>Spirodela polyrhiza</i>	Greater duckweed	Floating	OBL	Native
<i>Trapa bispinosa</i> var. <i>iinumai</i>	Two-horned water chestnut	Floating-leaved	OBL	Non-native
<i>Trapa natans</i>	European Water Chestnut	Floating-leaved	OBL	Non-native
<i>Wolffia sp.</i>	Watermeal	Floating	OBL	Native

3.5 Fish and Wildlife

Several snake species may inhabit the waters or adjacent wetlands of the proposed treatment regions including the eastern copperhead (*Agkistrodon contorix*), eastern wormsneke (*Carphophis amoenus*), northern black racer (*Coluber constrictor*), northern ring-necked snake (*Diadophis punctatus edwardsii*), timber rattlesnake (*Crotalus horridus*), eastern hog-nose snake (*Heterodon platirhinos*), northern mole kingsnake (*Lampropeltis rhombomaculata*), eastern milksnake (*Lampropeltis triangulum*), northern watersnake (*Nerodia sipedon*), northern rough greensnake (*Opheodrys aestivus*), eastern ratsnake (*Pantherophis alleghaniensis*), red cornsnake (*Pantherophis guttatus*), queensnake (*Regina septemvittata*), Dekay's brownsnake (*Storeria dekayi*), red-bellied snake (*Storeria occipitomaculata*), common ribbonsnake (*Thamnophis saurita*), eastern garter (*Thamnophis sirtalis*), and eastern smooth earthsnake (*Virginia valeriae*). These snakes either exclusively or partially inhabit aquatic and/or wetland areas, and at least part of their diets include aquatic organisms (e.g., frogs, fish, snails, salamanders, etc.) (VHS 2025).

Resident fish species that may inhabit the waters include but not limited to bluegill (*Lepomis macrochirus*), redear sunfish (*Lepomis microlophus*), largemouth bass (*Micropterus salmoides*), channel catfish (*Ictalurus punctatus*), walleye (*Sander vitreus*), black crappie (*Pomoxis nigromaculatus*), flathead catfish (*Pylodictis olivaris*), yellow perch (*Perca flacescens*) and northern snakehead (*Channa argus*).

A variety of amphibians may be present, including 11 species of frog that may inhabit the waters of the proposed program areas or the adjacent habitats: American bullfrog (*Rana catesbeiana*), coastal plains leopard frog (*Lithobates sphenocephalus utriculariu*), Cope's gray treefrog (*Hyla chrysoscelis*), eastern cricket frog (*Acris crepitans*), gray treefrog (*Hyla versicolor*), green frog (*Lithobates clamitans*), green treefrog (*Hyla cinerea*), northern cricket frog (*Acris crepitans*), pickerel frog (*Rana palustris*), upland chorus frog (*Pseudacris feriarum*), and wood frog (*Lithobates sylvaticus*). All species inhabit water bodies or bordering wetlands for at least a portion of their life cycles. Prey species include insects and other invertebrates, as well as other frogs (VADWR, 2025c).

While primarily terrestrial mammal species, the eastern gray squirrel (*Sciurus carolinensis*) and white-tailed deer (*Odocoileus virginianus*) may be present in the proposed program areas, additional common mammals include river otters (*Lutra canadensis*) and beavers (*Castor canadensis*). These species are semi-aquatic, spending a majority of time in the rivers and ponds where their dens are located. Beavers are primarily herbivores, feeding on woody trees and shrub species, and aquatic plants. River otters prefer fish, frogs, shellfish, insects, small birds and mammals (VADWR, 2025d).

The region is part of the Atlantic flyway for neotropical migratory birds and provides nesting and resting habitat for important bird species including waterfowl, raptors, and federally threatened and endangered species. Bald eagles (*Haliaeetus leucocephalus*) and ospreys (*Pandion haliaetus*) and their nests are commonly seen in large trees and snags along the edges of water bodies. Both bald eagles and osprey may utilize water bodies for forage, feeding on sunfish species such as bluegill (*Lepomis macrochirus*) and redear sunfish (*Lepomis microlophus*). Waterfowl may use these areas for breeding, overwintering, and migration. Mallards (*Anas platyhynchos*) are common dabbling foragers, which can be found in various types of water bodies including lakes and marshes. Their diets vary with location and season, consisting

primarily of plant material and occasionally small mollusks, crustaceans, and aquatic arthropods and minnows (Mass. Audubon, 2025).

Table 3-3 uses data from the U.S. Fish and Wildlife Service's (USFWS) Information for Planning and Consultation System (IPaC) to identify migratory birds that may occur within the broad program area (VA, MD, and D.C.) or that may be affected by the proposed program activities as will be further discussed in Section 4.8 (USFWS, n.d.-a). An asterisk indicates birds that may occur in the locations of the 2026 sites (see Appendix B for IPaC letter dated December 21, 2025). The table also denotes Birds of Conservation Concern (BCC), which the USFWS considers its highest conservation priorities based on a 2021 assessment of population trends, threats, and range size.

The ranges of the bald eagle and golden eagle (*Aquila chrysaetos*) overlap with the broad program areas and the proposed 2026 work sites. Although not listed as BCC, both species are protected under the Bald and Golden Eagle Protection Act. Bald eagles may breed at the proposed sites year-round. Golden eagles, however, are only present from November to March and do not breed in these areas. Therefore, golden eagles are not expected to be present during the proposed management activities, which would be scheduled from late spring through early fall (USFWS, 2025).

Table 3-3: Migratory birds in the program areas.

Species	Scientific Name	Birds of Conservation Concern (BCC) Status	Breeding Period
American Kestrel	<i>Falco sparverius paulus</i>	BCC – BCR	Apr 1 to Aug 31
American Oystercatcher	<i>Haematopus palliatus</i>	BCC Rangewide (CON)	Apr 15 to Aug 31
Bald Eagle*	<i>Haliaeetus leucocephalus</i>	Non-BCC Vulnerable	Sep 1 to Aug 31
Bicknell's Thrush	<i>Catharus bicknelli</i>	BCC Rangewide (CON)	Jun 10 to Aug 20
Black Scoter	<i>Melanitta nigra</i>	Non-BCC Vulnerable	Elsewhere
Black Skimmer	<i>Rynchops niger</i>	BCC Rangewide (CON)	May 20 to Sep 15
Black-billed Cuckoo*	<i>Coccyzus erythrophthalmus</i>	BCC Rangewide (CON)	May 15 to Oct 10
Black-capped Chickadee	<i>Poecile atricapillus praticus</i>	BCC – BCR	Apr 10 to Jul 31
Black-legged Kittiwake	<i>Rissa tridactyla</i>	Non-BCC Vulnerable	Elsewhere
Blue-winged Warbler*	<i>Vermivora cyanoptera</i>	BCC – BCR	May 1 to Jun 30
Bobolink*	<i>Dolichonyx oryzivorus</i>	BCC Rangewide (CON)	May 20 to Jul 31
Brown Pelican	<i>Pelecanus occidentalis</i>	Non-BCC Vulnerable	Jan 15 to Sep 30
Brown-headed Nuthatch	<i>Sitta pusilla</i>	BCC – BCR	Mar 1 to Jul 15
Canada Warbler*	<i>Cardellina canadensis</i>	BCC Rangewide (CON)	May 20 to Aug 10
Cerulean Warbler*	<i>Setophaga cerulea</i>	BCC Rangewide (CON)	Apr 26 to Jul 20
Chimney Swift*	<i>Chaetura pelagica</i>	BCC Rangewide (CON)	Mar 15 to Aug 25
Chuck-will's-widow*	<i>Antrostomus carolinensis</i>	BCC – BCR	May 10 to Jul 10
Coastal (wayne's) Black-throated Green Warbler	<i>Setophaga virens waynei</i>	BCC – BCR	May 1 to Aug 15
Common Eider	<i>Somateria mollissima</i>	Non-BCC Vulnerable	Jun 1 to Sep 30
Common Loon	<i>Gavia immer</i>	Non-BCC Vulnerable	Apr 15 to Oct 31
Double-crested Cormorant	<i>Phalacrocorax auritus</i>	Non-BCC Vulnerable	Apr 20 to Aug 31
Dovekie	<i>Alle alle</i>	Non-BCC Vulnerable	Elsewhere
Eastern Whip-poor-will*	<i>Antrostomus vociferus</i>	BCC Rangewide (CON)	May 1 to Aug 20
Golden Eagle*	<i>Aquila chrysaetos</i>	Non-BCC Vulnerable	Elsewhere
Golden-winged Warbler	<i>Vermivora chrysoptera</i>	BCC Rangewide (CON)	May 1 to Jul 20
Grasshopper Sparrow*	<i>Ammodramus savannarum perpallidus</i>	BCC - BCR	Jun 1 to Aug 20

Species	Scientific Name	Birds of Conservation Concern (BCC) Status	Breeding Period
Gull-billed Tern	<i>Gelochelidon nilotica</i>	BCC Rangewide (CON)	May 1 to Jul 31
Henslow's Sparrow	<i>Centronyx henslowii</i>	BCC Rangewide (CON)	May 1 to Aug 31
Hudsonian Godwit	<i>Limosa haemastica</i>	BCC Rangewide (CON)	Elsewhere
Kentucky Warbler*	<i>Geothlypis formosa</i>	BCC Rangewide (CON)	Apr 20 to Aug 20
King Rail*	<i>Rallus elegans</i>	BCC Rangewide (CON)	May 1 to Sep 5
Le Conte's Sparrow	<i>Ammospiza leconteii</i>	BCC Rangewide (CON)	Elsewhere
Least Tern*	<i>Sternula antillarum antillarum</i>	BCC Rangewide (CON)	Apr 25 to Sep 5
Lesser Yellowlegs*	<i>Tringa flavipes</i>	BCC Rangewide (CON)	Elsewhere
Long-eared Owl*	<i>Asio otus</i>	BCC Rangewide (CON)	Mar 1 to Jul 15
Long-tailed Duck	<i>Clangula hyemalis</i>	Non-BCC Vulnerable	Elsewhere
Magnificent Frigatebird	<i>Fregata magnificens</i>	BCC - BCR	Elsewhere
Marbled Godwit	<i>Limosa fedoa</i>	BCC Rangewide (CON)	Elsewhere
Northern Saw-whet Owl	<i>Aegolius acadicus</i>	BCC - BCR	Mar 1 to Jul 31
Painted Bunting	<i>Passerina ciris</i>	BCC - BCR	Apr 25 to Aug 15
Pectoral Sandpiper*	<i>Calidris melanotos</i>	BCC Rangewide (CON)	Elsewhere
Pomarine Jaeger	<i>Stercorarius pomarinus</i>	Non-BCC Vulnerable	Elsewhere
Prairie Warbler*	<i>Setophaga discolor</i>	BCC Rangewide (CON)	May 1 to Jul 31
Prothonotary Warbler*	<i>Protonotaria citrea</i>	BCC Rangewide (CON)	Apr 1 to Jul 31
Purple Sandpiper	<i>Calidris maritima</i>	BCC Rangewide (CON)	Elsewhere
Red Phalarope	<i>Phalaropus fulicarius</i>	Non-BCC Vulnerable	Elsewhere
Red-breasted Merganser	<i>Mergus serrator</i>	Non-BCC Vulnerable	Elsewhere
Red-headed Woodpecker*	<i>Melanerpes erythrocephalus</i>	BCC Rangewide (CON)	May 10 to Sep 10
Red-necked Phalarope	<i>Phalaropus lobatus</i>	Non-BCC Vulnerable	Elsewhere
Red-throated Loon	<i>Gavia stellata</i>	Non-BCC Vulnerable	Elsewhere
Ring-billed Gull	<i>Larus delawarensis</i>	Non-BCC Vulnerable	Elsewhere
Royal Tern	<i>Thalasseus maximus</i>	Non-BCC Vulnerable	Apr 15 to Aug 31
Ruddy Turnstone*	<i>Arenaria interpres morinella</i>	BCC - BCR	Elsewhere
Rusty Blackbird*	<i>Euphagus carolinus</i>	BCC - BCR	Elsewhere
Saltmarsh Sparrow	<i>Ammospiza caudacuta</i>	BCC Rangewide (CON)	May 15 to Sep 5

Species	Scientific Name	Birds of Conservation Concern (BCC) Status	Breeding Period
Scarlet Tanager*	<i>Piranga olivacea</i>	BCC - BCR	May 10 to Aug 10
Semipalmated Sandpiper*	<i>Calidris pusilla</i>	BCC - BCR	Elsewhere
Short-billed Dowitcher*	<i>Limnodromus griseus</i>	BCC Rangewide (CON)	Elsewhere
Sooty Tern	<i>Onychoprion fuscatus</i>	Non-BCC Vulnerable	Mar 10 to Jul 31
Surf Scoter	<i>Melanitta perspicillata</i>	Non-BCC Vulnerable	Elsewhere
Swallow-tailed Kite	<i>Elanoides forficatus</i>	BCC Rangewide (CON)	Mar 10 to Jun 30
Whimbrel	<i>Numenius phaeopus hudsonicus</i>	BCC - BCR	Elsewhere
White-winged Scoter	<i>Melanitta fusca</i>	Non-BCC Vulnerable	Elsewhere
Willet*	<i>Tringa semipalmata</i>	BCC Rangewide (CON)	Apr 20 to Aug 5
Wilson's Storm-petrel	<i>Oceanites oceanicus</i>	Non-BCC Vulnerable	Elsewhere
Wood Thrush*	<i>Hylocichla mustelina</i>	BCC Rangewide (CON)	May 10 to Aug 31
Yellow Rail	<i>Coturnicops noveboracensis</i>	BCC Rangewide (CON)	Elsewhere

Reference: USFWS, n.d.-a; USFWS, 2025

*Indicates birds that may occur in the locations of the proposed 2026 sites (see Appendix B for IPaC letter dated December 21, 2025).

BCC-BCR: Bird of Conservation Concern only in particular Bird Conservation Regions in the continental USA.

BCC Rangewide (CON): Bird of Conservation Concern throughout its range in the continental USA and Alaska.

Non-BCC Vulnerable: Bird of Conservation Concern in this area but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.

3.6 Benthic and Shellfish Resources

Common benthic organisms in freshwater bodies typically include macroinvertebrates, crustaceans, and algae. Macroinvertebrates such as stonefly nymphs (*Plecoptera*) and dragonfly nymphs (*Odonata*) are prevalent in these systems and serve as primary food sources for fish and birds. Crustaceans, including amphipods (*Gammaridae*) and freshwater snails (*Gastropoda*), contribute to organic matter decomposition and act as a food source for higher trophic levels. The distribution and abundance of benthic species are influenced by factors such as sediment composition, nutrient concentrations, dissolved oxygen levels, and overall water quality reference Section 3.2.

3.7 Threatened and Endangered Species

In accordance with Section 7 of the Endangered Species Act (ESA), the USFWS IPaC tool was used to identify federally listed species that may occur within the broader program area (VA, MD, and DC) or that may be affected by the proposed program. The initial IPaC species list was refined based on habitats associated with the proposed action (including waterways, ponds, lakes, wetlands, and forests).

The broader program area may provide suitable habitat for three mammals, one bird, one reptile, one amphibian, one fish, ten clams, one snail, two insects, one crustacean, and five plant species (Table 3-4), all of which are either federally listed as endangered or threatened or are proposed for such listing (USFWS, n.d.-a). Table 3-4 also provides their state status. Critical habitat for the Maryland darter (*Etheostoma sellare*), Atlantic pigtoe (*Fusconaia masoni*), yellow lance (*Elliptio lanceolata*), and the rusty patched bumble bee (*Bombus affinis*) overlaps the broader program area.

An asterisk indicates species that may occur and/or may be affected by the proposed 2026 management activities (see Appendix B for IPaC letter and official species list dated December 21, 2025). Since *Trapa bispinosa* and *Trapa natans* typically thrive in freshwater habitats, and no activities are expected in non-freshwater habitats, listed species under the jurisdiction of the National Marine Fisheries Service (NMFS) are not included in Table 3-4.

Table 3-4: Federally listed species known to occur in the broader program area

Species	Federal Listing Status/Proposed for Listing	State Status	Location and Time of Year in Program Area (VA, MD, DC)	Habitat Description
Mammals				
Indiana bat (<i>Myotis sodalis</i>)	Endangered	Endangered (VA), species of greatest conservation need [SGCN] (MD)	Primarily in the western portion of MD and VA, and in Caroline County, VA during the summer.	Roosts under peeling bark of sun-exposed, dead or dying trees in various forested habitats. Maternity roosts are often found in canopy gaps or along forest edges. Forages in semi-open to closed forests. Males utilize a broader range of roosting sites.
Northern long-eared bat* (<i>Myotis septentrionalis</i>)	Endangered	Endangered (VA, MD), SGCN (DC)	Throughout MD, VA, and DC in the spring, summer, and fall.	Roosts under bark, in cavities crevices of trees and sometimes structures, utilizing both live and dead trees. Exhibits flexible roost selection based on tree suitability and relies on forested areas for roosting, foraging, and commuting between habitats.
Tricolored bat* (<i>Perimyotis subflavus</i>)	Proposed endangered	Endangered (VA), SGCN and highly state rare (MD)	Throughout MD, VA, and DC in the spring, summer, and fall.	Primarily roosts in leaf clusters of deciduous trees. Also utilizes pine needles and artificial structures as roosts.

Species	Federal Listing Status/Proposed for Listing	State Status	Location and Time of Year in Program Area (VA, MD, DC)	Habitat Description
Birds				
Red-cockaded woodpecker (<i>Dryobates borealis</i>)	Threatened	Endangered (VA), endangered extirpated (MD)	Southeast VA all year.	Prefers to excavate cavities in mature longleaf pines, often older than 80 years and infected with red heart disease. These cavity trees form clusters, averaging 10 acres, with actively used trees exhibiting flowing sap as a defense. Territories range from 125 to 200 acres, influenced by habitat and population density.
Reptiles				
Bog turtle (<i>Glyptemys muhlenbergii</i>)	Threatened	Endangered (VA), threatened (MD), SGCN (DC)	Northern MD in the spring and summer.	Shallow, open-canopy wetlands with herbaceous vegetation, using both aquatic and terrestrial microhabitats. Hibernates in densely vegetated areas under roots, rock walls, or burrows.
Amphibians				
Eastern hellbender (<i>Cryptobranchus alleganiensis</i>)	Proposed endangered	Endangered (MD)	Western VA and MD all year.	Perennial streams and rivers where they spend much of their time lying motionless under large, flat rocks.
Fish				
Maryland darter (<i>Etheostoma sellare</i>)	Endangered	Endangered (MD)	Deer Creek, Harford County, MD all year. Critical habitat overlaps Deer Creek.	Thrives exclusively in fast-flowing riffles where upland streams transition to the coastal plain.

Species	Federal Listing Status/Proposed for Listing	State Status	Location and Time of Year in Program Area (VA, MD, DC)	Habitat Description
Clams				
Dwarf wedgemussel (<i>Alasmodonta heterodon</i>)	Endangered	Endangered (VA, MD), SGCN (DC)	Central VA, St. Mary's, Queen Anne's, and Caroline Counties, MD all year.	Sand, firm muddy sand, firm clay, or gravel bottoms in creeks and rivers of varying sizes with a slow to moderate current. To survive, they need a silt-free, stable streambed and well oxygenated water free of pollutants.
Atlantic pigtoe (<i>Fusconaia masoni</i>)	Threatened	Threatened (VA)	Throughout VA all year. Critical habitat is located in portions of Craig Creek off the James River, Nottoway River, Meherrin River, and the Roanoke River.	Coarse sand and gravel, rarely in silt and detritus. Historically, the best populations existed in small creeks to larger rivers with excellent water quality, where flows were sufficient to maintain clean, silt-free substrates.
Yellow lance (<i>Elliptio lanceolata</i>)	Threatened	Threatened (VA, MD)	Throughout VA, MD, and DC all year. Critical habitat is designated in the Patuxent River, Rappahannock Subbasin, Rapidan Subbasin, South Anna River, Johns Creek, and the Nottoway Subbasin.	Occurs in streams and rivers, generally in clean, coarse to medium sands and sometimes in gravel substrates.

Species	Federal Listing Status/Proposed for Listing	State Status	Location and Time of Year in Program Area (VA, MD, DC)	Habitat Description
Green floater* (<i>Lasmigona subviridis</i>)	Proposed threatened	Threatened (VA), endangered (MD), SGCN (DC)	Throughout VA and MD all year.	Prefers streams with slow to medium flows and good water quality. Often found in sand or small gravel substrates. When they occur in larger streams and rivers, they are found in quieter pools and eddies, away from strong currents.
Cumberland moccasin shell (<i>Medionidus conradicus</i>)	Proposed endangered	SGCN (VA)	Southwest VA all year.	A natural body of running water.
Finerayed pigtoe (<i>Fusconaia cuneolus</i>)	Endangered	Endangered (VA)	Southwest VA all year.	Clean, fast-moving water with relatively stable cobble, gravel, and sand substrates free of siltation. Usually found buried in the substrate in shallow riffles, ford, and shoal areas but can also occur in deeper runs.
Fluted kidneyshell (<i>Ptychobranhus subtentus</i>)	Endangered	Endangered (VA)	Southwest VA all year.	A natural body of running water.
Shiny pigtoe (<i>Fusconaia cor</i>)	Endangered	Endangered (VA)	Southwest VA all year.	Clean, fast-moving water with relatively stable cobble, gravel, and sand substrates free of siltation. Usually found buried in the substrate in shallow riffle, ford, and shoal areas but can also occur in deeper runs.
Slabside pearlymussel (<i>Pleurionaiia dolabelloides</i>)	Endangered	Endangered (VA)	Southwest VA all year.	A natural body of running water.

Species	Federal Listing Status/Proposed for Listing	State Status	Location and Time of Year in Program Area (VA, MD, DC)	Habitat Description
Tennessee clubshell (<i>Pleurobema oviforme</i>)	Proposed endangered	SGCN (VA)	Headwaters of the Tennessee river system in southwest VA all year.	A natural body of running water.
Snails				
Virginia fringed mountain snail (<i>Polygyriscus virginianus</i>)	Endangered	Endangered (VA)	New River, Pulaski County, VA all year.	Six miles of bluffs along New River.
Insects				
Rusty patched bumble bee (<i>Bombus affinis</i>)	Endangered	Endangered (VA, MD), SGCN (DC)	Western VA in the summer. Queens may overwinter in the program area. Critical habitat is located just north of Lake Moomaw in Hot Springs, VA.	Variety of habitats including prairies, woodlands, marshes agricultural landscapes, and residential parks and gardens. Nests are located in upland grasslands and shrublands.
Monarch butterfly* (<i>Danaus plexippus</i>)	Proposed threatened	SGCN (DC)	Throughout VA, MD, and DC in the spring, summer, and fall.	Fields, roadside areas, open areas, wet areas and urban gardens. Milkweed and flowering plants are required. Adult monarchs feed on the nectar of many flowers during breeding and migration, but they lay eggs on milkweed plants as that is the only food the caterpillars can eat.

Species	Federal Listing Status/Proposed for Listing	State Status	Location and Time of Year in Program Area (VA, MD, DC)	Habitat Description
Puritan tiger beetle** (<i>Cicindela puritana</i>)	Threatened	Endangered (MD)	Along a 26-mile stretch of sandy beach backed by tall, eroding cliffs in Calvert County; at the mouth of the Sassafras River in Kent and Cecil Counties; Severn River in Anne Arundel County. Primarily occur from June to August.	Narrow sandy beaches and eroding bluffs and cliffs.
Crustaceans				
Hay's spring amphipod (<i>Stygobromus hayi</i>)	Endangered	SGCN (DC)	Primarily in the Rock Creek area in DC all year.	Shallow, dark, organic-rich groundwater habitats called hypotelminorheic zones. These perched aquifers are underlain by clay and feed into seepage springs. Forest cover is crucial, providing food, water quality regulation, and moderating water temperature.
Flowering Plants				
Harperella (<i>Ptilimnium nodosum</i>)	Endangered	Endangered (VA, MD)	Stafford, Prince William, and Mecklenburg Counties, VA, Allegany County, MD all year.	Grows in wet soils near a body of water and can survive periodic, moderate flooding.
Northeastern bulrush (<i>Scirpus ancistrochaetus</i>)	Endangered	Endangered (VA, MD)	Frederick County, MD and western Virginia all year.	Grows in wet areas – small wetlands, sinkhole ponds or wet depressions with seasonally fluctuating water levels. It may be found at the water's edge, in deep water or in just a few inches of

Species	Federal Listing Status/Proposed for Listing	State Status	Location and Time of Year in Program Area (VA, MD, DC)	Habitat Description
				water, and during dry spells there may be no water visible where the plant is growing.
Sensitive joint-vetch (<i>Aeschynomene virginica</i>)	Threatened	Threatened (VA, MD)	Throughout VA and MD all year.	Thrives in the intertidal zone of coastal marshes, particularly at the upper tidal limits with diverse vegetation. It favors sparsely vegetated, disturbed microhabitats for establishment and growth, acting as an early-successional species. This annual plant commonly colonizes areas with new soil deposits, roadside ditches, and muskrat disturbances.
Small whorled pogonia* (<i>Isotria medeoloides</i>)	Threatened	Endangered (VA), Endangered Extirpated (MD)	Throughout VA all year.	Grows in older hardwood stands of beech, birch, maple, oak, and hickory that have an open understory. Sometimes it grows in stands of softwoods such as hemlock. It prefers acidic soils with a thick layer of dead leaves, often on slopes near small streams.

Species	Federal Listing Status/Proposed for Listing	State Status	Location and Time of Year in Program Area (VA, MD, DC)	Habitat Description
Swamp pink (<i>Helonias bullata</i>)	Threatened	Endangered (VA, MD)	Throughout VA all year.	Requires an area that is perennially saturated but not flooded, with the water table at or near the surface. Found naturally in bogs, under shrubs, and in peaty soil.

* An asterisk indicates species that may occur and/or may be affected by the proposed 2026 management activities (see Appendix B for IPaC letter and official species list dated December 21, 2025).

** Not listed in the IPaC official species list; however, identified by the USFWS Chesapeake Bay Field Office as potentially occurring in the program area.

References: USFWS, *n.d.-b*; MDDNR, *n.d.*; MDDNR, 2021; MDDNR, 2023; VADWR, 2025b; VADWR, 2025c; DOEE, 2015; USFWS, 2025

3.8 Air Quality

The U.S. Environmental Protection Agency (USEPA) has established National Ambient Air Quality Standards (NAAQS), which define the maximum allowable concentrations of various air pollutants. These standards cover key monitoring parameters, including ozone, fine particulate matter (PM_{2.5}), coarse particulate matter (PM₁₀), sulfur dioxide (SO₂), carbon monoxide (CO), lead, and nitrogen dioxide (NO₂). Individual states may adopt these Federal standards or implement more stringent ones. In the identified area of interest of the proposed program, air quality conditions vary depending on both geographic location and seasonal changes.

The Clean Air Act (CAA) establishes the framework for modern air pollution control, and delegates primary responsibility for regulating air quality to the States, with oversight by the USEPA. The USEPA develops rules and regulations to preserve and improve air quality as minimum requirements of the CAA, and delegates specific responsibilities to state and local agencies. Seven specific pollutants (called criteria pollutants) have been identified to be of concern with respect to the health and welfare of the general public. The criteria pollutants are carbon monoxide (CO), sulfur dioxide (SO₂), nitrogen dioxide (NO₂), ozone (O₃), particulate matter 10 micrometers or less in aerodynamic diameter (PM₁₀), particulate matter 2.5 micrometers or less in aerodynamic diameter (PM_{2.5}), and lead (Pb). The USEPA has established the National Ambient Air Quality Standards (NAAQS) for these pollutants. Areas that do not meet the NAAQS are called non-attainment areas. For non-attainment areas, the CAA requires States to develop and adopt State Implementation Plans (SIP) (USEPA, 2025).

Based on the USEPA Green Book ([epa.gov/green-book](https://www.epa.gov/green-book)), both Maryland and Virginia have areas that are in attainment and non-attainment for various pollutants. For Maryland, the following counties are designated as non-attainment for ozone (8-Hour Standard, 2015 and 8-Hour Standard, 2008): Anne Arundel County, Baltimore County, Baltimore City, Carroll County, Harford County, and Howard County. The same counties are in maintenance status for particulate matter (PM_{2.5}, 1997). In Virginia, Arlington County, Fairfax County, Prince William County, Stafford County, Spotsylvania County, Prince George's County, City of Alexandria, City of Fairfax, City of Falls Church, City of Manassas, and City of Manassas Park are in non-attainment for ozone (8-Hour Standard, 2015 and 8-Hour Standard, 2008). These same counties are in maintenance status for particulate matter (PM_{2.5}, 1997). Washington D.C. is part of the Washington D.C.-Maryland-Virginia nonattainment area for ozone.

3.9 Historic and Archaeological Resources

Historic and archaeological resources were identified for the areas of potential effects (APEs) where work is proposed for the summer of 2026, that are either eligible for or listed in the National Register of Historic Places (NRHP). Because the region for this program is broad, the presence of cultural resources will be specifically evaluated as sites are identified for management activities. Coordination with agencies and tribes will be conducted annually as sites are identified and will be documented in a Record of Environmental Consideration.

Cultural Resources are expressions of human activity, use, or occupation. They can be defined as manifestations of human culture and history in the physical environment such as precontact or historic period archaeological sites, buildings, structures, objects, districts, sacred sites, landscapes, among others. Cultural resources may also include aspects of natural features, plants, and animals that are deemed important or significant to a group or community. It is

important to note that historic properties, as defined in 36 Code of Federal Regulations (CFR) Part 800, the implementing regulations of Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, are cultural resources that are eligible for or listed in the NRHP. Additionally, to be considered a historic property, the resource must meet at least one of the following significance criteria:

Criterion A – Association with events that have made a substantial contribution to the broad patterns of our history; or,

Criterion B – Association with the lives of persons substantial in our past; or,

Criterion C – Embodiment of the distinctive characteristics of a type, period, or method of construction, or that represents the work of a master, or that possess high artistic value, or that represent a substantial or distinguishable entity whose components may lack individual distinction; or,

Criterion D – have yielded, or may be likely to yield, information important in prehistory or history.

A historic property must also possess enough integrity to portray its significance. A resource that retains integrity will embody several, and usually most, of the seven aspects of integrity. These aspects include location, design, setting, materials, workmanship, feeling, and association.

Section 106 of the NHPA requires consultation with the State Historic Preservation Office (SHPO), federally recognized Native American tribes, and other interested consulting parties for proposed federal actions that may affect historic properties. The Maryland Historical Trust (MHT) and the Virginia Department of Historic Resources are designated as the SHPOs for Maryland and Virginia, respectively. The USACE initiated consultation via letter dated 15 January 2026, with the MHT, VDHR, Baltimore County, Fairfax County, Loudoun County, Prince William County, Catawba Indian Nation, Chickahominy Tribe Eastern Division, Delaware Nation, Delaware Tribe of Indians, Eastern Shawnee Tribe of Oklahoma, Monacan Indian Nation, Seneca-Cayuga Nation, and Pamunkey Indian Tribe. Consultation letters and responses are included in Appendix B.

As part of this assessment, preliminary APEs were defined to identify any potential historic properties that could be affected by the activities proposed for summer 2026. The APEs include those areas where direct impacts are proposed and areas within which the undertaking may directly or indirectly cause alterations in the character or use of historic properties, including visual effects. For this program, the preliminary APEs include areas of proposed plant removal and staging and access areas. The USACE assessed previously identified resources using the MHT's cultural resources information system, Medusa, and the VDHR's Cultural Resources Information System (VCRIS). Due to the nature of impacts of the proposed activities previously identified archaeological and above-ground resources within approximately 500 feet of the preliminary APEs were noted to provide an assessment of impacts to cultural resources (Table 3-5).

A review of Medusa and VCRIS indicates that sixty-one resources are within 500 feet of proposed plant removal areas and water bodies. Of these, four archaeological resources and seventeen above-ground resources intersect with areas of potential plant removal. None of the

resources are designated as a National Historic Landmark.

Table 3-5: Resources identified within 500 feet of project components for summer 2026.

Resource Name	NRHP Eligibility	Resource Type	Project Component**
Lake Accotink 3 (44FX1972)	Not evaluated	Archaeological	ACCL-VA
Rifle Pits (44FX2734)	Not evaluated	Archaeological	ACCL-VA
(44FX1963)	Not evaluated	Archaeological	ACCL-VA
Unfinished Railroad (44FX2670)	Not evaluated	Archaeological	ACCL-VA
Federal Picket Post (44FX2733)	Not evaluated	Archaeological	ACCL-VA
(44FX1414)	Not evaluated	Archaeological	ACCL-VA
Ravensworth Farm Neighborhood (029-6869)	Not eligible	above-ground	ACCL-VA
Ivakota Farm (44FX1450)	Not evaluated	Archaeological	BAFO-VA
Union Mills Historic District (029-0410)*	Eligible	above-ground	BAFO-VA
Buckland Mills Battlefield (030-5152)*	Eligible	above-ground	BRIL-VA
Brittle View Farm (030-5262)	Not evaluated	above-ground	BRIL-VA
BLSS6 (44FX3719)	Not evaluated	Archaeological	BURL-VA
BLSL7 (44FX3720)	Not evaluated	Archaeological	BURL-VA
BLSL5 (44FX3718)	Not evaluated	Archaeological	BURL-VA
BLSL4 (44FX3717)	Not evaluated	Archaeological	BURL-VA
BLSL3 (44FX3716)	Not evaluated	Archaeological	BURL-VA
Burke Lake 1 (44FX3674)*	Not evaluated	Archaeological	BURL-VA
Burke Lake 2 (44FX3675)	Not evaluated	Archaeological	BURL-VA
(44FX0171)	Not evaluated	Archaeological	BURL-VA
Mine Run Battlefield (068-0017)*	Eligible	above-ground	GADM-VA
Rapidan River and Clark Mountain Rural Historic District (068-5033)*	Eligible	above-ground	JAQU-VA
Bridge #6071, Clarks Mountain Road (068-5033-0488)	Not evaluated	above-ground	JAQU-VA
Dwelling, 7621 Hawthorne Drive (068-5033-0298)	Not evaluated	above-ground	JAQU-VA
(44FX1825)	Not evaluated	Archaeological	MERL-VA

Resource Name	NRHP Eligibility	Resource Type	Project Component**
(44FX1824)	Not evaluated	Archaeological	MERL-VA
(44FX1823)	Not evaluated	Archaeological	MERL-VA
(44FX0140)	Not evaluated	Archaeological	MERL-VA
(44FX0844)	Not evaluated	Archaeological	MERL-VA
(44FX0843)	Not evaluated	Archaeological	MERL-VA
Southwest Loudoun Rural Road Network (053-6564)*	Not evaluated	above-ground	MPFP-VA
Kathleen B. Bell House (053-0688)*	Not evaluated	above-ground	MPFP-VA
Auburn Battlefield (030-5140)*	Listed	above-ground	ODLL-VA
The Lakes #2 (44FX3410)	Not evaluated	Archaeological	TLG2-VA
Twin Lakes 1 (44FX1977)	Not evaluated	Archaeological	TLG2-VA
(44FX3307)	Not eligible	Archaeological	BARL-VA
Bristoe Station Battlefield (076-5036)*	Eligible	above-ground	CBCP-VA
Cannon Branch Cemetery (155-5025)	Not eligible	above-ground	CBCP-VA
Bristoe Station Battlefield (076-5036)*	Eligible	above-ground	CBFP-VA
Cannon Branch Fort Site (155-5020)*	Listed	Archaeological	CBFP-VA
(44PW1213)	Not eligible	Archaeological	DITB-VA
(44PW1209)	Not evaluated	Archaeological	DITB-VA
House, Nokesville Road (076-5019)	Not eligible	above-ground	DITB-VA
(44FX1782)*	Not evaluated	Archaeological	MARL-VA
Battle of Chantilly (029-0162)*	Not evaluated	above-ground	MLWP-VA
Gunston Hall (029-6937)*	Listed	above-ground	PBGC-VA
Pohick Bay Cabin (029-5028)*	Not evaluated	above-ground	PBGC-VA
Little River United Church of Christ (029-7032)*	Not evaluated	above-ground	PBGC-VA
(44FX0112)*	Not eligible	Archaeological	PBGC-VA
(44FX0744)	Not evaluated	Archaeological	PBGC-VA
Lincolnia (029-6946)*	Listed	above-ground	PCG2-VA
Lincolnia (029-6946)*	Listed	above-ground	PCG8-VA
Bristoe Station Battlefield (076-5036)	Eligible	above-ground	PWD1-VA

Resource Name	NRHP Eligibility	Resource Type	Project Component**
Bristoe Station Battlefield (076-5036)*	Eligible	above-ground	PWD2-VA
Battle of Gainesville (076-5190)*	Eligible	above-ground	PWMC-VA
(44FX2566)	Not eligible	Archaeological	SRSC-VA
(44FX2571)	Not eligible	Archaeological	SRSC-VA
Nike Admin Midden (44FX2568)	Not eligible	Archaeological	SRSC-VA
Buckland Mills Battlefield (030-5152)*	Eligible	above-ground	WARL-VA
(44FX1411)	Not evaluated	Archaeological	WMMP-VA
(44FX3308)	Not eligible	Archaeological	WOOL-VA
Lake Jackson Historic District (076-0390)*	Eligible	above-ground	XXX11-VA
Battle of Gainesville (076-5190)*	Eligible	above-ground	XXX13-VA
Silo and Ruins, Route 674 (076-0509)	Not evaluated	above-ground	XXX13-VA
(44PW1527)	Not evaluated	Archaeological	XXX13-VA
Schrom Airport, 1928-1952 (WASHEA-QF20)*	Not evaluated	Archaeological	SHLP-MD
Gunpowder Falls State Park (HA-2037)*	Not evaluated	above-ground	XXX1-MD
Gunpowder Falls State Park (BA-3004)*	Not evaluated	above-ground	XXX1-MD

*Indicates resources that intersect areas of potential plant removal. No specific location information is given.

**See maps in Appendix A for locations of summer 2026 project components (site ID).

3.10 Recreation and Aesthetics

As part of the cost-share requirement for this work, it was determined that the water bodies proposed for management of the two horned water chestnut are publicly accessible. Depending on their location, these water bodies offer recreational opportunities around the water body, including walking/hiking, biking, or bird watching, and/or water-based activities such as boating, kayaking, canoeing, and fishing.

3.11 Noise

Current locations of the predominant populations of water chestnut, from Prince George's

County southwest to Fairfax and Prince William Counties (around Dale City and Manassas), are highly urbanized, with forested and agricultural lands occurring away from population centers. The noise at the water bodies of interest are primarily associated with natural, recreational, and residential activities. Sources of noise will vary throughout the region, but highest noise levels are attributed to urban and residential areas, primarily from vehicular traffic and construction activities.

4 Plan Formulation

Development of this report generally followed the USACE six-step planning process. This process identifies and responds to problems and opportunities associated with the objective, as well as specified State and local concerns. The process provides a flexible, systematic, and rational framework to make determinations and decisions at each step based on constraints, objectives, and assumptions. This allows the interested public and decision-makers to be fully aware of the basic assumptions employed, the data and information analyzed, the areas of risk and uncertainty, and the significant implications of each plan that is considered.

The six main steps of the USACE planning process are as follows:

1. Identifying problems and opportunities
2. Inventorying and forecasting conditions
3. Formulating alternative plans
4. Evaluating alternative plans
5. Comparing alternative plans
6. Selecting a plan

4.1 Problems and Opportunities

Both species of the water chestnut (*Trapa bispinosa* and *Trapa natans*), are invasive, non-native aquatic plants, that cause a multitude of problems within the water bodies they infest in Maryland and Virginia and threaten water bodies within the region, including in the District of Columbia, through their rapid expansion. Non-native aquatic plant species are not as susceptible to the natural population controls that impact native aquatic plant species; accordingly, when an invasive non-native plant is introduced, they often outcompete native aquatic plant species for habitat and nutrients.

Problems posed by these invasive species can be divided into three categories: Infrastructure Impacts, Health and Safety Impacts, and Environmental Impacts, and are summarized below.

4.1.1 Infrastructure Impacts

- Floating rafts of aquatic invasive plants impede the operation of fish ladders or other fish passage structures, thus impacting the ability of certain fish species to migrate past dams to their spawning grounds.
- Floating rafts of aquatic invasive plants can block water intakes, pipes, or other infrastructure associated with water treatment or hydroelectric plants, leading to temporary shutdowns in operations and costly annual maintenance.
- Dense infestations of aquatic invasive plants negatively impact navigation by restricting narrow channels, inundating shallow waters, and contributing to sedimentation in shallow channels.
- Invasive aquatic plants interfere with boat propellers, swimming, and fishing, thus reducing recreational opportunities along water bodies.
- Private property owners with infested ponds may experience a decrease in property value and use, and/or incur costs related to plant management.

4.1.2 Health and Safety Impacts

- Water chestnut contains sharp spines on their fruit which can injure people swimming or walking in impacted areas.
- Water chestnut spread inhibits navigation of waterways.

4.1.3 Environmental Impacts

- Invasive aquatic plant infestations convert diverse native plant communities into monocultures that reduce suitable habitat for native flora and fauna.
- Invasive aquatic plants often outcompete native aquatic plant species for habitat and nutrients due to their ability to rapidly take up nutrients and proliferate.
- Habitat structures are often altered due to the presence of dense mats of invasive aquatic plant infestations.
- Decomposition of invasive aquatic plant mats can result in depleted oxygen and liberated nutrients, producing algae blooms that deplete dissolved oxygen further and can result in large fish kills. These harmful algal blooms can also release toxins into the ecosystem.
- Water quality is degraded by the presence of invasive aquatic plants due to reduced light penetrations and altered nutrient cycles.

Through management of the water chestnut, there is the opportunity to benefit aquatic species by restoring native vegetation, maintaining suitable habitat, and restoring ecosystem and shoreline function. The program's reduction of water chestnut would benefit the ecosystem, resident and transient wildlife, and the public by providing more resilient/reliable infrastructure, expanding and improving the quality of recreational opportunities, and diversifying ecosystems.

4.2 Objectives and Constraints

The planning objectives for this program are to:

- Reduce existing populations and the associated negative impacts of water chestnut (*Trapa natans* and *Trapa bispinosa*) throughout water bodies in D.C., Maryland, and Virginia.
- Reduce the probability of the expansion of water chestnut within the region.
- Increase the effectiveness of management measures and the ability to rapidly respond to future and ongoing water chestnut infestations.
- Conduct monitoring and surveys to assess the need for and progress of management methods.

Planning constraints are resource, legal, or policy considerations that limit the range or type of actions that could be implemented to meet planning objectives. The following constraints were identified for this evaluation:

- Comply with Federal, State, and local laws, regulations, and policies.
- Implement the program consistent with authorizing legislation and guidance.
- Avoid adverse effects to threatened and endangered species.
- Avoid adverse impacts to water quality.

4.3 Management Measures

This section describes the potential measures and alternatives that could be implemented under a cost-shared program with MWCOG to manage water chestnut populations and to rapidly respond to species expansion. As sites are identified for water chestnut management, measures will be evaluated to determine which method is most suitable for that location. One management measure or a combination could be used at each site.

4.3.1 Manual Removal

Hand-pulling is frequently employed alongside other management strategies, such as chemical management, and is particularly effective for the immediate suppression of small, localized populations of water chestnut, where the entire infestation can be reached by wading or boat (usually canoes or kayaks). Hand-pulling requires the complete extraction and appropriate disposal of plants prior to fruit maturation to prevent seed dispersal (Dodd, unpublished data; Hummel & Kiviat, 2004). This method is highly labor-intensive (Sweany & Heffernan, 2022), and its success depends on strict adherence to best management practices.

Hand-pulling efforts should begin when rosettes first emerge, typically from mid-June to early July, prior to seed development. Each plant must be removed as thoroughly as possible, including the stems, developing seeds, and roots, while taking care to avoid disturbing native aquatic vegetation. Management teams identify and designate access points, on-site storage areas for drying harvested material, and final disposal locations prior to beginning removal.

Management efforts proceed from the perimeter of the infestation inward to prevent spread. To ensure effective reduction of the seed bank, sites should be revisited multiple times throughout the growing season to remove any new emergent individuals. Annual early-season removal should be repeated until the seed bank is fully depleted. Long-term monitoring is essential to confirm the absence of viable seeds and to detect any reintroductions from external sources.

4.3.2 Mechanical Management

Mechanical management involving the physical removal of invasive aquatic plants, using equipment such as harvesters and rakes, has been studied and used by USACE for decades for management of aquatic invasive species. This method typically includes cutting, pulling, or tilling to eliminate unwanted vegetation. Mechanical harvesting is most effective in densely invaded areas (>25% water chestnut surface area coverage), where plants are growing in mats (USACE, 2024).

There are different types of mechanical harvesters, which are generally types of barges designed to collect and unload vegetation using a conveyor system on a boom, adjusted to the appropriate height, which is commonly up to 6 feet below the surface of the water, but some harvesters can reach depths of approximately 15 feet. The most widely used harvesters for management of water chestnut are cutter/mower harvesters or hydro-rakes, also called grab harvesters.

Cutter/mower harvesters have rotating cutting blades, which trim plants near the water surface before the plants can drop seeds. These are used in lakes, rivers, and large ponds with dense infestations. Cutter harvesters collect material and bring it aboard the vessel using a conveyor belt. When the barge has reached capacity, cut material is transported to a disposal site and offloaded using the conveyor. These harvesters are only operable in depths of six feet or greater, so access must exist with the necessary depth where it can be loaded into the water body. Harvester barges are driven by a diesel or electric engine, which powers a paddle wheel for propulsion and hydraulics for operating the conveyor system and cutter bars.

Hydro-rakes are a floating pontoon boat with paddlewheels equipped with a rake for targeted removal of plants, including near shorelines or in small ponds where hand-pulling is impractical. The arm with a rake or bucket selectively removes target plants with their roots, which can reduce regrowth more effectively than cutting alone; however, plants could break apart contributing to spread. As opposed to cutter harvesters, hydro-rakes require as little as one foot water depth in which to operate. The hydro-rake is powered by a diesel engine, which drives the hydraulically operated paddle wheel propulsion system. The hydro-rake needs to be loaded into the water similar to a boat. Collected plants can be offloaded onto shore or a nearby barge.

Before initiating mechanical management, an aquatic plant survey is needed to assess the plant community and determine whether harvesting could negatively impact native or protected species. Mechanical management methods are generally non-selective, meaning it is difficult to only impact target species, although a trained machine operator can carefully identify and avoid non-target vegetation. Mechanical harvesting is most effective when initiated early in the growing season—typically from mid-June to early July, when rosettes first appear and before seed development begins.

Efforts should be made to remove as much of each plant as possible, including stems, roots, and any developing seeds. Mechanical removal early in each growing season will help to exhaust the seed bank over time but generally needs to be combined with other removal techniques, including hand pulling, to eradicate the plant occurrence. Monitoring should continue to ensure the seed bank has been depleted and that no new introductions have occurred from outside sources.

Mechanical harvesting should be avoided in areas where water chestnut co-occurs with invasive species that reproduce through fragmentation, such as Eurasian watermilfoil, as this method may unintentionally aid in their spread.

4.3.3 Biological Management

Biological management methods for invasive species include the introduction of bio-management agents, or natural enemies, to target and manage the invasive species. At the time this Programmatic EA is being drafted, no known biological management method has been approved for water chestnut management, although the water lily leaf beetle (*Galerucella birmanica*) has shown promising results against *Trapa* sp. (Sweany & Heffernan, 2022). If a suitable biological management is identified in the future, the Programmatic EA may be updated to assess its potential impacts.

4.3.4 Water Drawdowns

Water level drawdowns have demonstrated efficacy as a management technique for managing the spread of water chestnut. Drawdown is used to expose plants to air and dry them out, causing desiccation and freezing. This method requires impoundment of water by a dam or other water control structure that enables water levels to be drawn up and down so that plants are exposed to the air. To optimize effectiveness, drawdowns must be implemented at carefully planned intervals and to specific depths to inhibit regrowth from seed banks. Because such interventions may have more serious ecological consequences than other methods, potentially affecting native aquatic vegetation and fauna, this method will not be utilized for the cost-shared program with MWCOCG and impacts are not assessed within this Programmatic EA.

4.3.5 Chemical Treatment with Herbicides

Chemical treatment with herbicides is a common and effective method for managing water chestnut. Herbicide treatments are conducted by licensed herbicide applicators in accordance with product labels and permit conditions (see Section 5). All herbicides are applied using a foliar application method (broadcast spray or spot spray) applied from a boat or by walking using a backpack sprayer targeting foliage of target plants and limiting overspray. Treatments should be conducted in the early summer prior to the water chestnut going to seed.

There are different classes of herbicides that are useful for different species and site settings: contact and systemic herbicides (described below). Chemicals are registered by USEPA for aquatic use in the United States, but fewer may be legal in each state. This section discusses herbicides that will most likely be used for chemical treatment under the program and in the initial proposed management activities in 2026; however, Table 4-1 includes a more comprehensive list of herbicides that are approved for use in Maryland, D.C. (by USEPA), and Virginia. These or other USEPA licensed aquatic herbicides that are also approved in Maryland, D.C., and Virginia may be used for future applications of water chestnut management. See Section 5 for information on licensing and registration of aquatic herbicides.

Table 4-1: Potential chemical herbicides for treatment* of water-chestnut.

Chemical Name	Absorption	Selectivity	Trade Names
Flumioxazin	Contact	Broad-spectrum	Clipper SC, Alligare Flumigard
Copper/copper compounds	Contact	Broad-spectrum	Nautique®
Diquat	Contact	Broad-spectrum	Aquavet
Endothall	Contact	Broad-spectrum	Aquathol
Imazamox	Systemic	Selective	Alligare Imox
Fluridone	Systemic	Selective	Alligare Fluridone
Triclopyr	Systemic	Selective	Trycera, Alligare Triclopyr 3
2,4-D	Systemic	Selective	Challenger
Glyphosate	Systemic	Broad-spectrum	AquaMaster, Aqua-Sek, Rodeo

*Herbicides that would be used for the proposed management activities in 2026 are discussed in detail in the below text. This table includes a more comprehensive list of herbicides that could be used in the future as appropriate.

4.3.5.1 Contact Herbicides

Contact herbicides quickly absorb into exposed plant surfaces and kill the aboveground plant material while limiting the emergence of new reproductive structures for a given period (NEANS, 2020). These herbicides act immediately on the tissues contacted, causing cellular damage at the point of uptake, but not affecting areas uncontacted.

A contact herbicide for management of water chestnut includes flumioxazin, a protoporphyrinogen oxidase (PPO) inhibitor that blocks the production of heme and chlorophyll (WDNR, 2022b). Flumioxazin was first registered with USEPA in 2010 and is a broad-spectrum contact herbicide available in granular or liquid forms that inhibits chlorophyll production in plants. Upon application to actively growing plants, treated plants are rapidly affected and begin to decompose. In areas with dense vegetation, applications should be spaced approximately two weeks apart to minimize aquatic impacts, as plant decomposition can lead to low oxygen levels. It is recommended to apply the herbicide in the spring to young plants and during early morning or evening hours to reduce volatilization (WDNR, 2022a).

Flumioxazin quickly degrades in the water column so plants that do not initially come in contact with the herbicide will not be affected (WDNR, 2022a). Commercial products that are utilized for water chestnut management in Virginia must be approved for aquatic use by the USEPA and the Virginia Department of Agriculture and Consumer Services (VDACS). Subsurface applications are commonly used to manage invasive species such as Eurasian watermilfoil (*Myriophyllum spicatum*) and curly-leaf pondweed (*Potamogeton crispus*). Native submerged species susceptible to subsurface flumioxazin application include coontail (*Ceratophyllum demersum*), fanwort (*Cabomba carliniana*), naiads (*Najas* spp.), variable watermilfoil (*Myriophyllum heterophyllum*), duckweeds (*Lemna* spp.), and pondweeds (*Potamogeton* spp.). American lotus (*Nelumbo lutea*) (a native waterlily) has not been shown to be sensitive to flumioxazin (La´Zaro-Lobo et al. 2025). The herbicide is moderately toxic to freshwater fish and invertebrates but is non-toxic to birds and mammals with short-term exposure. To reduce environmental potential impacts, pesticide application should follow proper best management practices that are listed in Section 5.3.1 and be applied by a licensed applicator. Human health

risks primarily affect herbicide applicators, as concentrated flumioxazin may cause skin and eye irritation. Approved products containing flumioxazin include Clipper SC and Alligare Flumigard.

4.3.5.2 Systemic Herbicides

Systemic herbicides are usually slow-acting and inhibit enzyme activity in target plants, which requires intermediate to long exposure periods with target plants. These herbicides are absorbed into the plant and moved or translocated within the plant tissue, causing death of the whole plant including belowground structures (NEANS, 2020). Potential systemic herbicides to be used to manage water chestnut include imazamox, fluridone, triclopyr, and 2,4-D.

4.3.5.2.1 Imazamox

Imazamox is an USEPA registered systemic herbicide effective on many submerged, emergent and floating broadleaf and monocot aquatic plants. Imazamox is available in granular or liquid formulations that inhibits acetolactate synthase, an enzyme essential for plant growth. Imazamox can be surface or subsurface applied pre- or post-emergence. Commercial product formulations that are utilized for water chestnut management must be approved for aquatic use. Upon application, plant growth ceases, and decomposition typically occurs within several weeks. This herbicide is commonly used to manage invasive emergent species such as purple loosestrife (*Lythrum salicaria*) and Japanese knotweed (*Fallopia japonica*), as well as submerged species like curly-leaf pondweed (*Potamogeton crispus*) and Eurasian watermilfoil (*Myriophyllum spicatum*). Native species susceptible to imazamox include water stargrass (*Heteranthera dubia*) and water lilies (*Nymphaea* & *Nuphar*) (WDNR, 2022b).

Imazamox is generally non-toxic to freshwater fish, invertebrates, birds, and mammals. Human health risks are primarily associated with applicator exposure, which may cause eye and skin irritation when concentrated. In aquatic environments, imazamox degrades rapidly, binds to sediments, and is not considered a threat to recreational water use. Imazamox was registered with the USEPA in 2008, and an interim registration review decision was released in 2019 (WDNR, 2022b). Exposure and risk characterization evaluating scenarios including consumption, dermal, and oral exposure of contaminated water, vegetation, and fish resulted in hazard limits below the level of concern (SERA, 2010). Given that no human health concerns were identified in the USEPA Problem Formulation for registration review of imazamox, no drinking water assessments were conducted for aquatic use of imazamox and there are no residues of concern in food or water. The USEPA found imazamox to have an average half-life of 6.8 hours in clear water at pH's of 5, 7, and 9 (USEPA, 2015).

4.3.5.2.2 Fluridone

Fluridone is a systemic herbicide registered with the USEPA, primarily used for managing submerged, emergent, and floating-leaf aquatic vegetation. It works by inhibiting phytoene desaturase (PDS), an enzyme critical for protecting plants from sun damage. As a selective herbicide, fluridone targets specific plant species during particular growth stages, making it effective primarily when plants are actively growing (WDNR 2022c).

Fluridone is commonly used to manage invasive aquatic species, such as Eurasian watermilfoil and curly-leaf pondweed . It can also affect native plants, including coontail and water lilies

(*Nymphaea* and *Nuphar* spp.). Commercial formulations of fluridone include Sonar and Alligare Fluridone (WDNR 2022c).

In terms of toxicity, fluridone is considered slightly to moderately toxic to freshwater fish. However, when applied according to recommended rates, it does not cause significant short- or long-term effects on fish populations (USEPA 1986). Exposure to fluridone in mammals and birds, especially in cases of direct contact, may lead to both acute and chronic health impacts. In aquatic environments, fluridone exhibits low toxicity, and human health risks are generally limited to those handling the herbicide (WDNR 2022c). Potential health concerns for applicators include eye and skin irritation or respiratory issues from inhalation, which can be mitigated with proper personal protective equipment.

Fluridone is stable in water and breaks down primarily through photolysis. Its half-life in aquatic environments can range from a couple of days (natural pond water) to nine months in anaerobic conditions, depending on factors like temperature and sunlight. Notably, fluridone is not considered a significant threat to groundwater resources (WDNR 2022c).

4.3.5.2.3 Triclopyr

Triclopyr is a systemic herbicide registered by the USEPA for the selective management of broadleaf and woody plant species. It is available in both liquid and granular formulations, with two primary commercial forms: the triethylamine salt, which is approved for aquatic applications, and the butoxyethyl ester, which is used for terrestrial applications. This assessment specifically focuses on the triethylamine salt form, as it is the variant registered for aquatic use by the USEPA (WDNR 2022d). Commercial products containing Triclopyr include Renovate and Trycera.

The herbicidal action of Triclopyr is based on its ability to mimic the plant growth regulator auxin, leading to uncontrolled plant growth and eventual plant death. Following application, target plants typically exhibit symptoms of abnormal growth and undergo decomposition within one to two weeks. Triclopyr has been utilized to manage Eurasian watermilfoil (*Myriophyllum spicatum*) and purple loosestrife (*Lythrum salicaria*) (WDNR 2022d).

Triclopyr undergoes photolytic degradation, with its half-life varying significantly based on environmental conditions. In aerobic, well-lit environments, the half-life ranges from approximately 1 to 12 days. However, in anaerobic conditions, such as deeper waters with reduced oxygen levels the half-life can extend up to 3.5 years. This extended persistence in anaerobic conditions is attributed to the slower microbial degradation in such environments. The presence of organic matter in sediments and the shallow nature of the water can accelerate the breakdown of Triclopyr (Strid et.al., 2018).

The herbicide does not exhibit significant sorption to soil particles and is therefore not considered a major risk for groundwater contamination under typical usage conditions (Strid et al., 2018).

Toxicological studies indicate that Triclopyr is of low toxicity to non-target organisms, including birds, freshwater fish, invertebrates, and pollinators such as bees. However, its degradation products may pose moderate to slightly higher toxicity to aquatic species (Strid et al., 2018). There are no restrictions on water use, including activities such as swimming or fishing,

following application of Triclopyr. The primary occupational risks are to applicators, who may experience skin irritation or permanent eye damage due to exposure to concentrated formulations. While respiratory risks are minimal, appropriate protective measures should be taken to mitigate dermal and ocular exposure (WDNRd,2022).

4.3.5.2.4 2,4-D

2,4-D is a systemic herbicide registered by the USEPA, primarily used to manage submerged, emergent, and floating-leaf vegetation. Common commercial products include Weedar 64, Sculpin G, and Freelexx, with the herbicide available in both liquid and granular forms. 2,4-D targets broadleaf species, effectively managing invasive plants like Eurasian watermilfoil as well as native species such as coontail and duckweeds (*Lemna* spp.). Similar to Triclopyr, 2,4-D works by mimicking the plant growth hormone auxin, causing the plant's stems to bend, twist, and ultimately leading to growth inhibition. This process results in plant decay within one to two weeks, although full decomposition can take several weeks (WDNR 2022e).

After application, there are no water use restrictions for activities like fishing, but swimming is prohibited for 24 hours (WDNR 2022e).

In terms of toxicity, 2,4-D is generally low in toxicity to humans, with most adverse reactions being respiratory (e.g., coughing) or skin-related (e.g., irritation). However, the herbicide's impact on other organisms varies depending on its formulation. The ester variant is considered moderately to highly toxic to freshwater fauna, while the amine variant is only slightly toxic to aquatic organisms. Either variant could be used for the proposed action. 2,4-D is typically considered to be non-toxic to moderately toxic to mammals and birds (Jervais et al., 2008).

When applied to water bodies, 2,4-D mixes relatively quickly, making it effective for managing vegetation across large areas. Its half-life ranges from 13 days in aerobic conditions to 40 days in anaerobic environments, though it can vary depending on environmental factors (Jervais et al., 2008).

4.4 Measures Screening

Management measures were screened to determine which methods met the identified planning objectives without violating planning constraints (Table 4-2). All measures meet the three Planning Objectives for reducing existing populations, reducing probability of expansion, and increasing the ability to respond to future spread of the species. Therefore, measures screening was based on the violation of Planning Constraints, which include compliance with regulations and program guidance, and avoidance of adverse impacts to T&E species and water quality.

Biological management was screened because there are no approved bio-management agents for water chestnut that are compliant with Federal, State, and local laws, regulations and policies. This measure has the potential for significant environmental impacts and unintended adverse effects on native plants and wildlife, including T&E species. Water drawdown was screened because of significant adverse impacts to all aquatic vegetation and fauna that may inhabit the water bodies where drawdown would occur. The other measures, including manual removal, mechanical management, and chemical treatment are methods that are routinely used in the management of aquatic invasive species and, while some adverse environmental impacts

are possible, have been shown to benefit the environment overall when applied judiciously. Impacts from these measures are discussed in Section 5.

At this time, there are no identified locations that include stands of two horned water chestnut that are large enough to require mechanical harvesting; however, should this occur, a multi-pronged approach is needed to address infestation, of which harvesters have been shown to be successful to reduce stands of invasive aquatic plants. Dense stands of Eurasian water chestnut could be candidates for management through mechanical measures as well.

Table 4-2: Screening of measures by planning objectives and constraints

Measure	Reduce Existing Water Chestnut	Reduce Probability of Expansion	Increase Ability to Respond to Future Spread	Violates Planning Constraint?
Manual Removal	X	X	X	No
Mechanical Management	X	X	X	Potential impacts to non-target plants -requires careful site assessment
Biological Management	N/A	N/A	N/A	N/A – No suitable management method exists. Measure screened.
Water Drawdown	X	X	X	Yes - Impacts to non-target plants, fish, and other aquatic organisms. Measure screened.
Chemical Treatment	X	X	X	Potential impacts to non-target species and water quality – Requires evaluation of T&E species at location and herbicide application per label guidelines/permit conditions

4.5 Alternatives and Plan Recommendation

Alternatives are a combination of management measures that would meet the program objectives. Two alternatives have been defined for comparison, including Alternative 1, the No Action Alternative and Alternative 2, cost-shared management of water chestnut. Given the potential adverse impacts of the spread of water chestnut, Alternative 2 is the Proposed Action and Recommended Plan.

4.5.1 Alternative 1, No Action Alternative

The No Action Alternative establishes the baseline against which the environmental and operational impacts of other alternatives are evaluated. Under this alternative, the USACE would not participate in cost-sharing efforts with the MWCOG for the management of water chestnut within Maryland, Virginia, and Washington D.C.

Currently, water chestnut management is carried out by state agencies, municipalities, and private landowners through a variety of independently administered state and local programs, utilizing diverse management methods and funding mechanisms. Under the No Action Alternative, these existing management efforts may continue unchanged, be scaled back, or be discontinued entirely, depending on the availability of resources and shifting priorities at the state, local, or private level.

If management activities are reduced, terminated, or maintained at the same level, there is a potential for significant proliferation of water chestnut in unmanaged areas, which could lead to increased ecological and recreational impacts associated with its spread. The impacts of water chestnut spread to infrastructure, health and safety, and the environment are described in Sections 4.2 to 4.4.

4.5.2 Alternative 2, Cost-Shared Program Management (Preferred Alternative)

The USACE proposes to share the cost of the MWCOG's management efforts to assist with the reduction of water chestnut populations throughout Virginia, Maryland, and Washington D.C. The goal of water chestnut management is to prevent and/or minimize the impacts of water chestnut infestation on native/natural habitats, infrastructure, and recreational opportunities. The aim is to eventually manage/eradicate known water chestnut populations thereby eliminating or reducing the need for subsequent management efforts. The following are methods that could be used by MWCOG and collaborating agencies that will conduct the water chestnut management:

- Manual removal
- Mechanical management
- Chemical treatment with herbicides

The management method(s) would be selected based on site-specific considerations. Not all methods will be used at every site, although some sites could require multiple management methods. Under the program, the use of one or more of these measures may be adjusted annually by MWCOG based on site specific considerations, funding availability, the results of regional coordination efforts to manage the plant, and new data on the effectiveness of treatment efforts.

4.6 Economic and Program Costs

4.6.1 Economic Costs of Invasive Species Management

This Section describes the costs and benefits of the proposed action and examines its economic impacts. Engineer Regulation 1105-2-103, Chapter 6, cites the general authority for aquatic ecosystem restoration provided by 33 U.S.C. §2213 (c)(7) and allows USACE participation in this program under general authority for USACE to restore degraded aquatic ecosystems. This ER (6-5)(a) also directs that "economic, social, and environmental benefits, impacts and costs are to be identified, measured, and/or qualitatively characterized using the four Principle & Guideline accounts". Because the specific costs of invasive species management are not readily available at the resolution necessary to perform a quantitative assessment of benefit-cost, a qualitative assessment has been performed. For example, available costs are generally combined costs for all invasive species management efforts, sometimes broken down to aquatic versus terrestrial invasive species, but not broken down to the species level or by geographic area. These are not useable for a quantitative assessment.

Economic costs from the spread of aquatic invasive species are associated with a variety of damages and reduction in ecosystem services, which are generally not well studied or documented. Reductions in ecosystem services arise through alterations to habitat complexity and structure. Aquatic invasive plants, including water chestnut, reduce light to benthic organisms, reduce biodiversity, affect nutrient cycling, alter sediment stability, and reduce water quality (Hassan and Nawchoo, 2020; Barko and James, 1998; Kovalenko et al., 2010). Aquatic invasive plants can obstruct channels, reduce the value of recreational waters by impeding access, negatively impact fisheries and aquaculture, elevate flood risk, and damage or impede water supply or power generation infrastructure. Despite well recognized impacts, it is inherently difficult to determine the monetary value of damages from aquatic invasive species, especially related to losses to ecosystem services.

Global economic costs of invasive aquatic species have increased exponentially since 1960, with an annual global cost of \$23 billion in 2020 (Cuthbert et. al., 2021). Costs of the management of *Trapa bispinosa* are not well known, given its relatively new appearance, and costs of the management of *Trapa natans* are not well documented. Macêdo et al., (2024) estimated the costs of the management and negative impacts related to floating aquatic invasive species in the U.S., between 1975 and 2020, at \$4.7 billion. Naylor et al. (2003) reported that USACE efforts to manage *Trapa natans* in the Potomac River from 1939 to 1945 had an estimated cost of \$3.7 million (1950 dollars converted to 2004 dollars). For *Trapa natans* in Lake Champlain, as of 2020, over \$14 million has been spent on management efforts by the Federal, State, and local agencies and stakeholders, with over \$6 million of that total from USACE efforts (USACE, 2024). Management efforts are time consuming and often require years of follow-up monitoring and/or treatment to be successful. Significant economic impacts could be realized, should *Trapa bispinosa* spread into the Potomac River.

One MWCOG partner in Virginia, the Fairfax County Department of Public Works, reported costs for recent management efforts for two-horned water chestnut in County lakes. They caution that there is no per acre cost estimate, and that costs tend to be higher if an infestation has been present longer or if the water body is hard to access. Annual costs are estimated for as follows for several water bodies:

- Huntsman Lake, 29 acres: \$9,176
- Lake Mercer, 43 acres: \$15,440
- Woodglen Lake, 13 acres: \$3,132
- Lake Barton, 38 acres: \$5,000

Alternative 2, Cost-Shared Program Management of water chestnut, reduces the risks to infrastructure, health and safety, and environmental impacts described in Section 4.1. This alternative is considered in relation to other alternatives and within the context of the four criteria described in the Principles, Requirements, and Guidelines and USACE Agency Specific Procedures (2024) for completeness, effectiveness, efficiency, and acceptability, which are described below:

- Completeness – the extent to which an alternative provides and accounts for all features, investments, and/or other actions necessary to realize the planned effects, including any necessary actions by others. Alternative 2, Cost-Shared Program Management, is the most complete solution available to reduce the risk of water chestnut infestations. This alternative includes a combination of measures to control water chestnut and leverages the collective efforts of multiple jurisdictions to allow for rapid identification and management of water chestnut; thereby accounting for all

necessary investments, including actions by others.

- **Effectiveness** – the extent to which an alternative alleviates the specified problem and achieves the specified opportunities: The combination of measures and regional participation in the program under Alternative 2 will best serve to meet planning objectives to reduce existing populations, reduce probability of expansion, and increase the ability to respond to water chestnut infestations. This alternative is a broad solution over a large geographic area that will increase the effectiveness of future and ongoing control measures in Maryland, Virginia, and DC.
- **Efficiency** – The extent to which an alternative alleviates the specified problems and realizes the specified opportunities at the least cost. If aquatic invasive plants are not managed, they will eventually outcompete native, beneficial vegetation. Once water chestnut is established, some water bodies require perpetual management resulting in compounding costs. The proposed action will help avoid unnecessary costs that could arise from severe infestations. While the social and environmental benefits of water chestnut management are not well quantified, from USACE experience with Trapa Natans in the Potomac and elsewhere, the costs of a cost-shared program to manage water chestnut would undoubtedly be a small fraction of the costs associated with operations and maintenance costs resulting from severe infestations in water bodies within the region.
- **Acceptability** – The viability and appropriateness of an alternative from the perspective of the Nation’s general public and consistency with existing laws, authorities, and public policies. Alternative 2, Cost-Shared Program Management, is acceptable to stakeholders and the public and consistent with applicable laws, regulations, and public policies.

4.6.2 Program Costs

Program costs for the proposed alternative will be cost-shared between USACE and MWCOG, the non-Federal Sponsor. Table 4-3 shows the approximate breakdown of costs for work to be performed in 2026. Total costs for 2026 are estimated to be \$864,800. Of that, \$747,000 will be shared 50%/50% between USACE and MWCOG. After the 2026 field effort, MWCOG will submit a Work Plan annually for work to be cost-shared in subsequent years. Federal participation in the program is dependent on both the non-Federal Sponsor and Federal ability to fund and implement the APCP, with Federal funds specifically appropriated by Congress. It is anticipated that future annual costs will be of a similar magnitude.

Table 4-3: Estimated costs for management work to be performed in 2026

2026 Estimated Cost Items	Amount
Federal Costs – Not Cost-Shared (Planning, Federal Environmental Compliance)	\$ 117,800
Federal Costs – Cost-Shared (Project Management & Oversight)	\$ 27,000
Non-Federal Costs (Management Efforts & Administration)	\$ 720,000
Total Cost	\$ 864,800
Total Cost-Shared Costs	\$ 747,000
50%/50% Cost-Shared Activities	\$ 373,500

5 Environmental Impacts

This Section discusses the potential positive and adverse environmental consequences of the No Action Alternative and the Proposed Action. The anticipated effects associated with the No Action Alternative are compared to those of the Proposed Action. The proposed action is intended to manage and reduce the risk of invasive water chestnut infestations, resulting in reduction and avoidance of adverse economic, environmental, and social consequences of such infestations.

Since this is a Programmatic EA to include future locations of management efforts, impacts are generally discussed broadly. However, for some resources (e.g., Threatened and Endangered Species and Cultural Resources) an appropriate impact evaluation cannot be conducted until specific locations are known. Therefore, for those resources, this section also includes impacts related to the sites identified for management efforts in 2026. In future years, these resources will specifically be evaluated under a Record of Environmental Consideration as new sites are identified.

5.1 Minimization of Impacts

5.1.1 Aquatic Pesticide Licensing and Registration

Licensing and Registration by EPA:

USEPA regulates the sale, distribution and use of pesticides under the statutory framework of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) to ensure that when used in conformance with FIFRA labeling directions, pesticides will not pose unreasonable risks to human health and the environment. All new pesticides, for which registration is required, must undergo a registration procedure under FIFRA during which USEPA assesses a variety of potential human health and environmental effects associated with use of the product (USEPA, 2025). The information sheets for some of the potential commercial products considered for use, located in Appendix C, identify some chemicals as “highly toxic”; however, they do not specify the targets of this toxicity (humans, wildlife, etc.). The USEPA has identified these chemicals as “practically non-toxic” to a broad spectrum of aquatic life, such that they have met the rigorous requirements for licensing for aquatic application.

Under FIFRA, USEPA is required to consider the effects of pesticides on the environment by determining, among other things, whether a pesticide “will perform its intended function without unreasonable adverse effects on the environment,” and whether “when used in accordance with widespread and commonly recognized practice [the pesticide] will not generally cause unreasonable adverse effects on the environment” (7 U.S.C. 136a(c)(5)). In performing this analysis, USEPA examines the ingredients of a pesticide, the intended type of application site and directions for use and supporting scientific studies for human health and environmental effects and exposures. The applicant for registration of the pesticide must provide specific data from tests done according to USEPA guidelines. When USEPA approves a pesticide for a particular use, the Agency imposes restrictions through labeling requirements governing such use. The restrictions are intended to ensure that the pesticide serves an intended purpose and avoids unreasonable adverse effects (USEPA, 2024).

Herbicides included in the preferred alternative have been evaluated by USEPA and if products

are applied per label instructions, treatments may affect but are not likely to adversely affect the environment, which is defined as effects that are beneficial, insignificant, or extremely unlikely to occur. Significant long term health risks to aquatic organisms, pollinators (e.g., bees), birds, reptiles, amphibians, or mammals are unlikely to occur.

The herbicides that are proposed to be used under the preferred alternative are not anticipated to pose any risk to the environment or humans. The herbicides will be stored in approved locations that comply with applicable regulations, standards, and policies. The herbicides will be transported, handled, and applied in accordance with USEPA approved label instructions. All individuals conducting the herbicide treatments will be certified pesticide applicators and knowledgeable of appropriate actions to take should a spill occur or accidental exposure to the herbicides.

5.1.2 Application of Pesticides under General Permits

In all three jurisdictions covered by this Programmatic EA (Maryland, Virginia, D.C.), National Pollutant Discharge Elimination System (NPDES) General Permits have been issued for the discharge of pesticides to surface waters for the purpose of the management of invasive species. NPDES General Permits are issued for groups of similar facilities or operations to simplify and expedite the permitting process for discharges with minimal environmental impacts. These General Permits include conditions for use that ensure pesticides do not significantly impact the aquatic environment, and include:

- Effluent limitations
- Requirements for application, including equipment operation, monitoring of weather conditions, and measures to reduce impacts to non-target species
- Surveillance to develop management strategies prior to application
- Monitoring requirements, including a visual assessment for adverse impacts
- Preparation of discharge management plan if annual application thresholds are exceeded
- Corrective actions, reporting, and management of spills and leaks or other adverse incidents

In Virginia, 9VAC25-800, NPDES VAG87 General Permit for Discharges Resulting from the Application of Pesticides to Surface Waters of Virginia governs discharges resulting from the application of pesticides to surface waters and is effective until 28 February 2029. Any operator that meets the eligibility requirements described in the regulation is authorized for the operator's discharges resulting from the application of pesticides to surface waters of the Commonwealth of Virginia. Eligibility includes use of pesticides (to include herbicides) for management of weeds, algae, pathogens, and pests in surface water.

In Maryland, General Permit No. 17-PE (NPDES Permit Number MDG87), Discharges from the Application of Pesticides, regulated the application of pesticides until its expiration on March 31, 2025. Since a new permit has not been issued, new discharges are not eligible for general permit coverage. In place of permit coverage under the expired permit, the Maryland Department of the Environment has issued an Order to cover proposed new discharges from the application of pesticides if an applicant meets the 17-PE eligibility criteria and declares intention to operate in accordance with the terms of the Consent Order and 17-PE. Pesticide application under 17-PE may not adversely affect "Desirable Species", which are defined as

threatened and endangered species, species in need of conservation, species of management concern, and the critical habitat required by these species. As described in Section 5.3.7 below, USACE determined that the proposed action will either have no effect or may affect, but is not likely to adversely affect (NLAA) threatened and endangered species or species proposed for listing. USACE provided a self-certification letter to the USFWS Virginia Ecological Services Field Office (ESFO) for species under their jurisdiction with an NLAA determination. The USFWS Chesapeake ESFO does not require self-certification for species under their jurisdiction with NLAA determinations.

In Washington D.C, USEPA remains the NPDES permitting authority. A USEPA issued General Permit, Pesticide General Permit (2021 PGP), currently covers point source discharges from pesticide applications to waters of the U.S. and is the governing authority in D.C. This permit is set to expire in October 2026 and is being replaced by the 2026 PGP effective 31 October 2026. The work described in this Programmatic EA is covered by these PGPs. If discharge related activities overlap with USFWS or National Marine Fisheries Service Listed Resources of Concern, then a notice of intent is required to be submitted.

Under the cost-sharing agreement for this program, MWCOG and its partner jurisdictions would implement the water chestnut management methods and are responsible for compliance with any permits and conditions.

5.1.3 Best Management Practices

The following actions, which are also generally included in the above discussed General Permits, aim to minimize impacts of herbicide applications based on Best Management Practices (AERF, 2020).

1. All herbicide applications will adhere to USEPA label requirements.
2. Pre- and post-treatment monitoring will occur per general permit conditions and to assess the efficacy of the herbicide treatments and non-target impacts.
3. In areas where mixed stands of non-target and target species occur, the appropriate selective herbicide will be used to provide more targeted treatment of water chestnut.

The USACE proposes the following conservation measures as part of the proposed action, many of which are also covered under General Permit conditions, in order to reduce potential adverse effects related to implementation of the proposed action. These conservation measures are not meant to be mitigation for the proposed action but are integral to the reduction of impacts (potential adverse effects) that may be incidental to the proposed action and must be considered when analyzing the potential effects of the proposed action.

General Practices:

1. Licensing/Certification:

- a) All herbicide applicators shall be state licensed or certified, or under the direct visual supervision of a state licensed or certified applicator.
- b) All herbicide applicators shall comply with all applicable Federal, State, and herbicide manufacturer's directions and requirements for handling pesticides, including storage, transportation, application, container disposal, and spill cleanup

- c) Herbicide application shall be according to the chemical manufacturer's label recommendations for best results. Applicators shall use caution to minimize the application of herbicides to non-target species and structures within the application areas.
- d) All mechanical equipment will be cleaned and inspected after use in a water body. This is extremely important for harvesters, if the vegetation rake has been working in water bodies known to be infested with noxious species.
- e) Proper signage and notices will be posted in treatment areas and adjacent areas warning of potential chemical exposure through contact, ingestion, or inhalation during activities such as boating, fishing, or swimming.

2. *Calibration/Maintenance:*

- a) All application equipment (e.g., booms, back packs, etc.) shall be properly calibrated according to the chemical manufacturer's suggested application rates printed on the chemical label prior to use. Equipment and settings shall be properly maintained for the duration of the contract performance period.
- b) Appropriately sized nozzles shall be used to minimize the potential for drift.
- c) Application equipment shall be maintained to ensure proper application rates, minimize leakage, reduce drift, and ensure applicator safety. Equipment shall be visually inspected prior to each application.

3. *Spill Management:*

- a) All applicators shall carry a Spill Prevention and Control Plan. The Plan shall provide detailed descriptions on how to prevent a spill or ensure effective and timely containment of any chemical spill. The Spill Prevention and Control Plan shall include spill control, containment, clean up, and reporting procedures.
- b) A spill kit must be available to all applicators and shall be within 150 feet of the application site.
- c) Equipment refueling will not occur within 100 feet of open water. This includes ATVs, trucks, and tractors.
- d) All concentrated or mixed solution pesticides shall be placed in locked storage in closed containers with watertight lids and placed in secondary containment vessels of 100 percent plus freeboard. A good rule of thumb is 110 percent of capacity.

4. *Disposal:*

Disposal of waste materials shall occur in accordance with the label and in accordance with all applicable Federal, State, and County laws regulations, as well as label restrictions and instructions.

5.2 Types of Impacts

Effects or impacts are changes to the human environment from the Proposed Action. Impacts can be beneficial or adverse, can be a primary result of an action or a secondary result, and can be permanent/long-term or temporary/short-term. Impacts can vary in degree from minor and temporary to significant and permanent. The identified impacts resulting from the treatment of water chestnut with aquatic herbicides are addressed in the succeeding sections.

5.3 Environment Impacts

5.3.1 Hydrology

5.3.1.1 No Action

Under the no action alternative, water chestnut will continue to expand throughout the water bodies forming dense stands and mats that could impact hydrology through alteration of water flow, sediment transport, and impacts to nutrient cycling.

5.3.1.2 Proposed Action

The preferred alternative is expected to result in long-term, less than significant effects that contribute to restoring a more natural hydrologic and sedimentation regime for the water body. Water chestnut typically inhabits slow moving water bodies such as ponds, lakes, and slow-moving streams and can clog water bodies with dense, floating mats. With management of water chestnut through manual, mechanical, or chemical methods, water chestnut will be removed, thereby improving flow conditions. In these slow-moving water bodies, degradation of herbicides is expected before water or sediment leaves the water body.

No anticipated long-term adverse impacts to hydrology are anticipated from the preferred alternative.

The proposed activity does not include development in a floodplain. As described in Section 5.1, herbicides would be applied by a licensed applicator following best management practices. As a result there would be no impacts to adjacent floodplains.

The currently infested area, where water chestnut is proposed to be treated under the proposed action in the summer of 2026, spans parts of six Hydrologic Unit Code 8 (HUC 8) watersheds (Table 3-1), which collectively influence the hydrologic and ecological dynamics of the region. Maps showing hydrologic connectivity of the water bodies targeted for proposed management efforts in 2026 and HUC 8 watersheds are in Appendix A.

Table 3-1: List of HUC 8 watersheds.

HUC 8 Code	HUC Name
02060002	Chester-Sassafras
02060003	Gunpowder-Patapsco
02070010	Middle Potomac-Anacostia-Occoquan
02070008	Middle Potomac-Catoctin
02080204	Rivanna

5.3.2 Water Quality

5.3.2.1 No Action

Without management of water chestnut, there may be minor impacts to water quality. Once established, floating aquatic plants can form dense mats that limit light penetration and crowd out native plants. Water quality will decline in the areas where water chestnut is present due to its effects on natural temperature, pH, and dissolved oxygen of the system. The fluctuations in these measures can contribute to the release of nutrients (e.g., phosphorus) from the sediments. There would be a seasonal decrease in dissolved oxygen when water chestnut senesces and decomposes causing harm and imbalances over the long-term. These factors can contribute to large algal blooms causing eutrophication and fish kills (Hou et al., 2013).

5.3.2.2 Proposed Action

Manual or mechanical management measures can temporarily affect water quality by increasing water turbidity and suspending nutrients. However, these impacts are typically short-term, minor, and limited to when the measure is implemented. Overall, manual and mechanical management measures can effectively treat and prevent infestations and has a net positive effect on water quality.

The proposed action includes a range of herbicide options to allow for versatility in rapidly addressing the threat of water chestnut expansion. As described in Section 5.1, minimization of impacts to water quality are ensured through EPA's program for licensing of pesticides and adherence to General Permit conditions for application to aquatic habitats.

Chemical treatment may have short-term adverse impacts, including a temporary increase in turbidity due to the degradation of water chestnut as well as a short-term decrease in dissolved oxygen due to the death and decomposition of water chestnut from herbicide treatment. Water chestnut dieback from the preferred alternative will result in a localized increase in baseline turbidity but these conditions will lessen as the native vegetation community and density is restored. The short-term decrease in dissolved oxygen will be temporary and the effects would be localized to treatment areas for a short period of time.

Herbicides may adsorb to sediments or persist in water bodies for varying durations, depending on the herbicide used and environmental conditions. The persistence of applied herbicides for water chestnut management varies, with each compound having distinct degradation rates in water. Flumioxazin degrades rapidly within the water column with a half-life of one to four days reducing long-term environmental impacts and a lower risk of accumulation within the ecosystem (USEPA, 2003). There are no restrictions on water use for swimming, fishing, or livestock drinking water. However, there is a five-day restriction for use of the receiving water for irrigation (WDNR 2022a). MWCOCG will evaluate water bodies prior to herbicide application and will coordinate with local landowners to ensure no damages to crop production.

Imazamox exhibits significant persistence in anaerobic environments, particularly in deeper water bodies. In contrast, in shallow waters where photolysis is more likely, its half-life is

approximately 7 hours (MDA, 2014; USEPA, 2015). The primary mode of breakdown is microbial degradation and environmental factors. Imazamox has a high affinity for binding to soil particles, which further reduces its persistence in the water column, thus minimizing risks to water quality. No restrictions are imposed on activities such as swimming, fishing, or use as livestock drinking water, provided label concentration limits are adhered to (WDNR, 2022b).

Fluridone demonstrates variable persistence in aquatic environments, with a half-life ranging from several days to a month, depending on environmental conditions such as water temperature and sunlight. Photolysis is the predominant mechanism for fluridone degradation. In deeper or shaded water bodies, fluridone may persist for extended periods, increasing the duration of exposure for aquatic plants. There are no restrictions for swimming, fishing, or livestock water consumption following fluridone application.

Triclopyr persistence in aquatic systems is highly influenced by environmental factors such as sunlight intensity and dissolved oxygen levels. In well-illuminated, oxygen-rich conditions, triclopyr has a half-life of approximately 1 to 12 days. However, in shaded and oxygen-poor environments, the half-life can extend up to 3.5 years. Following application, there are no restrictions on water use, including swimming or fishing. For irrigation, triclopyr concentrations must be equal to or less than 1 ppb, or a minimum of 120 days must pass post-application before the water can be used (WDNR, 2022d). Although triclopyr is not considered to degrade groundwater, its degraded product 3,5,6 trichloro-2pyridinol (TCP) is relatively mobile and can degrade groundwater (Strid et al., 2018). MWCOC will evaluate water bodies prior to herbicide application and will consider potential groundwater impacts.

2,4-D concentrations in water are influenced by various environmental conditions. Its half-life ranges from 13 days in aerobic conditions to approximately 40 days in anaerobic environments. Other factors such as water temperature and microbial activity also contribute to its breakdown. After 2,4-D application, there are no restrictions for fishing or livestock drinking water. If the ester formulation is used, a 24-hour restriction applies to swimming. For water consumption, a waiting period of 7 to 21 days is required if 2,4-D is applied within a setback distance to a water supply, until concentrations fall below 70 ppb. Irrigation restrictions vary depending on the rate of application and the specific 2,4-D formulation used (WDNR, 2022e). MWCOC will evaluate water bodies prior to herbicide application and will consider potential water consumption impacts.

The proposed management of water chestnut is expected to have less than significant effects on water quality. Short-term, minor adverse effects may occur during implementation, such as temporary increases in turbidity from mechanical removal or localized changes in water chemistry following chemical application. Over the long term, these actions would contribute to the restoration of more natural water quality conditions, including water temperatures, pH levels, and dissolved oxygen concentrations. "Many of the water bodies that will be treated for this program have restricted outflow, resulting in relatively slow discharge rates. This allows applied herbicides ample time to degrade significantly before exiting the water body.

No anticipated long-term adverse impacts to water quality are anticipated from the preferred alternative.

5.3.3 Wetlands

5.3.3.1 No Action

Under the no action alternative, it is anticipated that there will be impacts to wetlands. Water chestnut would continue to spread throughout the littoral zone within water bodies and to any wetlands adjacent to these water bodies. Without management, water chestnut will outcompete native vegetation and alter water conditions that will lead to less diverse wetlands, reducing important ecosystem services such as fish and wildlife habitat, carbon sequestration, and others.

5.3.3.2 Proposed Action

The preferred alternative is anticipated to have minor impacts to wetlands. Managing water chestnut to levels that prevent encroachment into wetlands and that maintain densities that preserve the wetlands' integrity results in beneficial impacts to these ecosystems. Manual or mechanical methods for water chestnut removal occur within the water body at the site of infestation and are not anticipated to adversely affect wetlands. For chemical treatment, herbicide concentrations and the timing of treatment may have minor impacts to wetlands adjacent to application sites. Treatment would occur in favorable weather conditions to minimize herbicide drift. The applicator will minimize effects to surrounding native vegetation by targeting the water chestnut. Vegetation within the treatment areas will be monitored after treatment to determine impacts to non-target submerged and emergent vegetation.

No anticipated long-term adverse impacts to wetland resources are anticipated from the preferred alternative.

5.3.4 Aquatic Vegetation

5.3.4.1 No Action

The no action alternative will have impacts to aquatic vegetation. Without the preferred alternative, water chestnut will continue to spread throughout the water bodies where the species is present, outcompeting native aquatic vegetation such as American waterweed (*Elodea canadensis*) and pondweeds (*Potamogeton* spp.), which provide suitable food and habitat to native fish and wildlife species and their prey. Under the no-action alternative, the ecosystems of these water bodies would be severely negatively impacted.

5.3.4.2 Proposed Action

Manual removal specifically targets water chestnut, so there is the potential for short-term, minor impacts to surrounding aquatic vegetation. Mechanical harvesting is non-selective, meaning that there is a risk of removing native or beneficial vegetation. Mechanical harvesting will only be performed in areas with high density of water chestnut (>25% of water surface area) in mats. To minimize impacts to native vegetation, before initiating mechanical measures, an aquatic plant survey will assess the existing plant community to determine whether harvesting could negatively impact native or protected species. Mechanical management will not be performed if the impact to native species outweighs the benefit of water chestnut reduction. A trained machine operator who can carefully identify and avoid non-target vegetation will be employed for this removal method.

The preferred alternative involving the application of herbicides is anticipated to have short-term, minor impacts to aquatic vegetation at a treatment sites. Consistent with General Permit conditions, visual monitoring will occur after treatments to understand the efficacy of the herbicide treatments to manage water chestnut and impacts (if any) to non-target aquatic vegetation.

Common native aquatic plants, such as American waterweed (*Elodea canadensis*) and pondweeds (*Potamogeton* spp.) have a range of sensitivities to proposed herbicides and may be impacted by the water chestnut treatment, as discussed below. These species are anticipated to recover in the following growing seasons, especially without the encroachment of water chestnut. Since water chestnut is an annual that reproduces by seed, optimal timing of herbicide applications (generally in mid-June and July) is prior to fruit production or maturation to prevent seed production. The herbicide treatment plans will include two main factors that limit impacts to native species: 1) anticipated herbicide concentration and exposure times (CETs) to effectively and selectively manage water chestnut; and 2) the chosen herbicide and concentration to prevent impacts to non-target plants in the treatment area. Selective herbicides do not kill all plants so repeated herbicide use will be selective even when used over multiple years.

Flumioxazin is a rapid-acting herbicide that induces swift mortality in susceptible plant species. Native aquatic plants such as coontail and American eelgrass (*Vallisneria spiralis* L.), which possess the ability to disperse via seeds or rhizomes, may experience herbicide-induced injury from fast-acting herbicides under certain CET conditions. However, these species typically demonstrate recovery or reestablishment within the current growing season or the following season (Dodd et al., 2022; Mudge & Haller, 2010). Duckweeds (*Lemna* spp.) and pondweeds (*Potamogeton* spp.) are also susceptible to flumioxazin. The impact on native species will vary depending on the specific native species affected and the concentration of flumioxazin applied (Glomski et al., 2013). The lowest CET required to manage water chestnut will be used for the proposed action to minimize impacts to native species.

Imazamox is a systemic herbicide that translocate within plants, affecting both aboveground and belowground structures. Native aquatic plants exhibit varying levels of sensitivity to these herbicides. A study on the impact of imazamox on southern cattail (*Typha domingensis*) in the Florida Everglades indicated that imazamox was effective in managing southern cattail populations but had minimal effects on native macrophytes. The study also suggested that imazamox may serve as a preferred alternative to glyphosate, as it demonstrates greater selectivity for target species (Rodgers and Black, 2012).

Fluridone is a systemic herbicide that is primarily used for submerged, emergent, and floating-leaf vegetation and causes the effected plant to reduce the enzyme from protection of sun damage. Fluridone is a selective herbicide and is most effective when the targeted plant species are actively growing. A study focused on evaluating the effects of fluridone in Minnesota lakes which are dominated by Eurasian watermilfoil and coontail concluded that fluridone was effective in managing Eurasian watermilfoil in mesotrophic lakes (lakes with moderate nutrient levels) while not impacting native species. In eutrophic lakes, fluridone is effective, however due to declines of water clarity from decomposition, can have an impact to native species as it will decrease the distribution and abundance of submerged plants. After treatment in an eutrophic lake, it may take several years for a native species to return (Valley et al., 2006). Fluridone will not be used if the waterbody is shown to be eutrophic. MWCOG shall evaluate water bodies prior to any herbicide application to determine whether the waterbody exhibits eutrophic

conditions.

2,4-D is a systemic herbicide primarily employed for the management of submerged, emergent, and floating-leaf aquatic vegetation. It functions by mimicking the plant hormone auxin, disrupting normal physiological processes, which leads to abnormal growth and ultimately plant mortality. A study focused on the selective management of Eurasian watermilfoil (*Myriophyllum spicatum*) demonstrated that 2,4-D effectively managed the target species while exhibiting minimal non-target effects on native vegetation when applied at sub-lethal concentrations (Parsons et al., 2001). Similarly, a study conducted in Wisconsin assessed the ecological consequences of large-scale, low-dose 2,4-D applications on native aquatic species. Results indicated that whole-lake management strategies necessitated higher concentrations of 2,4-D, which in turn amplified its impact on non-target aquatic vegetation. In contrast, localized herbicide applications, restricted to specific sections of a water body, required lower doses of 2,4-D, thereby reducing exposure to native species (Nault et al., 2014). Prior to 2,4-D application, it is essential to assess target species density, distribution, and biomass to optimize treatment efficacy and minimize potential adverse effects on indigenous plant communities.

Overall, the preferred alternative would have less than significant effects on aquatic vegetation. Short-term, minor adverse effects on some non-target native plants may occur from mechanical disturbance or the application of herbicides. However, because the proposed herbicides are selective towards water chestnut, their long-term application would reduce the invasive population, allowing native aquatic vegetation to reestablish and eventually dominate, thereby restoring a more natural plant community.

5.3.5 Fish and Wildlife

5.3.5.1 No Action

Under the no action alternative, water chestnut would continue to grow uncontrolled, displacing native aquatic vegetation. Invasive aquatic plants can be beneficial to fish and other wildlife in the same way that natives are by providing surfaces for algae and small animals to live and by providing structure for cover and shelter (UF/IFAS, n.d.). However, invasive aquatic plants like water chestnut will often exceed densities of native aquatic vegetation while expanding into areas that do not contain natives at all. This can concentrate fish and wildlife into small areas of open water which exposes them to predators and limits their use of available habitat (UF/IFAS, n.d.).

5.3.5.2 Proposed Action

Manual removal, which is used on small populations of plant, is expected to have minimal negative impact on fish and wildlife. Mechanical harvesters physically disturb the aquatic habitat when they cut and remove plants, suspending sediment and increasing turbidity and nutrient release. This disruption can affect fish species that are using the water chestnut for shelter, food, or breeding. Removal of dense water chestnut mats that provide cover for small fish and invertebrates could make fish more vulnerable to predators. These impacts are anticipated to be temporary, where in the long run, the removal of water chestnut would help improve fish populations by restoring native vegetation habitat and preventing the negative effects of water chestnut overgrowth.

As discussed in previous sections, the herbicides considered under the preferred alternative have passed comprehensive USEPA risk assessment processes for registration of aquatic use at both the State and Federal levels (USEPA, 2008; USEPA, 2017). They are not anticipated to have significant, lasting effects on fish and wildlife resources. However, some aquatic organisms that are plant-dwelling may be adversely affected temporarily due to habitat loss following herbicide treatment. These impacts are expected to be minimal since aquatic organisms will be able to relocate to other locations within the water body and native plant species are anticipated to reestablish in the next growing season.

Flumioxazin is not expected to have long-term impacts on fish and wildlife resources. Under short-term conditions and below the maximum label rate, flumioxazin is slightly to moderately toxic to freshwater fish, with potential effects on larval growth (WDNR, 2022a). Moderate toxicity is considered by EPA to not be as dangerous as a poison (which is highly toxic) but can still cause irritation and health impacts. Given the one-to-four-day half-life and the low octanol-water partition coefficient of flumioxazin, the potential for bioaccumulation is low (USEPA, 2001).

Imazamox has low toxicity to fish and does not bioaccumulate in fish tissue (WDNR, 2022b). In particular, the USEPA (2015) found imazamox did not significantly accumulate in bluegill sunfish (*Lepomis macrochirus*), with whole and edible tissue indicating less than the minimum quantifiable limit. The results of acute exposure studies on this freshwater fish and freshwater invertebrates (*Daphnia magna*) have been summarized as practically non-toxic (USEPA, 2008; USEPA, 2015). No significant adverse effects are anticipated for the fish species of concern in the project areas given that the proposed application rates are within the concentration limits specified on the USEPA-approved herbicide.

Fluoridone is considered slightly to moderately toxic to aquatic species. Moderate toxicity is considered by EPA to not be as dangerous as a poison (which is highly toxic) but can still cause irritation and health impacts. Although, given its relatively short half-life in natural conditions of 34 hours, the overall short- and long-term impacts are minimal and the potential of bioaccumulation in fish is low (WDNR, 2022c).

The triethylamine salt variant of triclopyr is considered practically non-toxic to fish. However, at concentrations greater than 104 ppm, triclopyr may impact fish growth and length, although it does not bioaccumulate in fish (Strid et al., 2018). The degradation products of triethylamine salt are triclopyr acid and triethylamine, both of which are slightly to moderately toxic to fish. Only triethylamine bioaccumulates in fish, but it does not persist long, as its half-life in water is 5 to 12 days (WDNR, 2022d).

The toxicity of 2,4-D varies depending on the herbicide formulation. The ester formulation is moderately to highly toxic to freshwater fish, while the amine formulations are slightly to practically non-toxic. This difference in toxicity is due to the ester formulation's higher absorption rates through fish gills compared to the amine formulation. Additionally, early life stages of fish are more susceptible to the impacts of the herbicide (Jervais et al., 2008). Although 2,4-D can be toxic to freshwater fish, it only bioaccumulates in the form of degraded products and is easily metabolized (WDNR, 2022e).

To ensure that proposed herbicide applications do not cause short- or long-term impacts to freshwater fish, application rates must adhere to product label instructions and remain at or below the maximum allowable concentration specified on USEPA-approved labels. Furthermore, given that herbicide applications are likely to occur annually due to the recurring

presence of water chestnut, it is recommended that herbicides be rotated to mitigate the development of plant resistance to any single herbicide.

Taxa specific toxicity data are not available for amphibians and reptiles (USEPA, 2008; USEPA, 2020), but based on the general effects discussed, impacts to amphibians and reptiles are expected to be insignificant for all or the proposed herbicides.

The risk of acute impacts to birds from the proposed herbicides is expected to be low. Imazamox has been found to be essentially non-toxic to birds and mammals (WDNR, 2022b; USEPA, 2008). Flumioxazin is practically non-toxic to birds and small mammals based on short-term exposure (WDNR, 2022b). Fluridone has not been shown to cause any short- or long-term impacts to birds, while 2,4-D is moderately to practically non-toxic, and triclopyr is practically non-toxic to birds (WDNR, 2022c; Strid et al., 2018; WDNR, 2022e).

Impacts to threatened and endangered species are discussed in Section 5.3.7.

5.3.6 Benthic and Shellfish Resources

5.3.6.1 No Action

Under the no action alternative, water chestnut will continue to spread and form dense stands throughout water bodies. This will have adverse impacts to benthic and shellfish organisms within water bodies in the study area. The spread of water chestnut will severely limit the passage of light and reduce oxygen levels, which may cause impacts to aquatic macroinvertebrates and shellfish throughout these water bodies. Overall, changes in light penetration can result in cascading disruptions to these ecosystems.

5.3.6.2 Proposed Action

Effects on benthic organisms and shellfish from the preferred alternative are expected to be less than significant. Short-term, minor adverse effects may occur in localized areas during implementation, such as from temporary sediment disturbance or minor changes in water quality following herbicide application. However, these impacts would be temporary, and no long-term adverse effects are anticipated.

Manual removal of water chestnut could temporarily increase turbidity at the location where roots are removed, but minimal negative impact is expected on benthic organisms. Mechanical harvesters physically disturb the aquatic habitat when they cut and remove plants, suspending sediment and increasing turbidity and nutrient release. Depending on the mechanical harvesting method, direct mortality to aquatic invertebrates can be caused by the equipment itself or through increased turbidity. Populations of these species are expected to recover quickly. Ultimately, removal of dense water chestnut mats would improve light penetration to support a higher diversity of organisms.

The proposed herbicides have passed comprehensive USEPA risk assessment processes for registration of aquatic use at both the state and federal levels (USEPA, 2008; USEPA, 2011; USEPA, 2017). These decisions are based on field and laboratory studies and observations that analyze whether the active ingredient causes unreasonable risk to humans or the environment, including determining toxic concentrations for aquatic invertebrates. Registration of the

herbicides implies that the active ingredients will not have significant, lasting adverse impacts to the invertebrates that may be present. The proposed herbicides do not bioaccumulate in benthic organisms (WDNR, 2022a; WDNR, 2022b; WDNR, 2022c).

The herbicides considered for use under the preferred alternative may have varying degrees of acute risks to invertebrates; however, minimal documentation on negative impacts exist. Since imazamox primarily targets an enzyme found exclusively in plant species, the USEPA has determined that it is virtually non-toxic to aquatic invertebrates (USEPA, 2008). Flumioxazin undergoes rapid degradation in water, light, and under microbial influence. However, direct exposure to the compound has been identified as moderately toxic to benthic species. During the short-term exposure to flumioxazin, growth of benthic larvae may be adversely affected (WDNR, 2022b). The ester formulation of 2,4-D is moderately to highly toxic to freshwater fish while the amine formulation is slightly to practically non-toxic. Fluoridone is considered moderately toxic while the triethylamine salt variant of triclopyr is considered practically non-toxic to benthic species (WDNR, 2022c; Strid et al., 2018; WDNR, 2022e).

The proposed herbicides may adsorb onto sediments but would likely deactivate or degrade by light and microbes, becoming biologically unavailable and causing no toxicity or biological harm to organisms in the system. Based on the half-lives of the proposed herbicides, no significant impacts are anticipated from the preferred alternative because the residual herbicide will degrade rapidly. Imazamox exhibits mobility across various soil types; however, in shallow surface waters, it is expected to degrade primarily through photolysis. In deeper waters, particularly in anaerobic environments, imazamox may persist for extended periods (MDA, 2014).

Flumioxazin undergoes rapid photodegradation in water and is metabolized relatively quickly in aerobic soils. In anaerobic conditions, its degradation is accelerated, with a half-life of approximately four days (USEPA, 2003). Similarly, fluridone and triclopyr are degraded via photolysis and exhibit relatively short half-lives. However, they may adsorb to hydrosols, and degradation rates can vary depending on environmental conditions (WDNR, 2022c; Strid et al., 2018; WDNR, 2022e). Both forms of 2,4-D do not persist in water for extended periods, being highly mobile and only weakly bound to soil particles (Gervais et al., 2008).

5.3.7 Threatened and Endangered Species

Table 5-1 below summarizes the potential adverse effects to listed species as a result of the No-Action and the Proposed Action alternatives. An asterisk indicates species that may occur and/or that may be affected by the 2026 water chestnut management activities.

USACE provided a self-certification letter to the USFWS Virginia and Chesapeake Bay ESFOs for species under their jurisdiction with an NLAA determination. The USFWS Virginia ESFO responded on February 9, 2026, stating they had no comments on the determination. The Chesapeake Bay ESFO responded on February 11, 2026, with one comment on a proposed 2026 site located in the Sassafras River, and its potential effects on the puritan tiger beetle. After supplying USFWS with additional information, it was determined by both USFWS and MDDNR that work in the Sassafras River site will have no effect on the beetle (emails included in Appendix B).

Table 5-1: Summary of effects to listed species from the No-Action and the Proposed Action Alternatives.

Species	Habitat Description	Effects from the No-Action Alternative	Effects from the Proposed Action
Northern long-eared bat* (<i>Myotis septentrionalis</i>)	Roosts under bark, in cavities, or crevices of trees and sometimes structures, utilizing both live and dead trees. Exhibit flexible roost selection based on tree suitability and rely on forested areas for roosting, foraging, and commuting.	No effect. The spread of water chestnut will not affect the northern long-eared bat or their habitats.	Using the <i>USFWS Northern Long-eared Bat and Tricolored Bat Range-wide Dkey</i> , USACE determined that the work may affect, but is not likely to adversely affect the northern long-eared bat and the tricolored bat. Appendix B contains the results of the Dkey. This determination was based on several factors. The action area is not located within 0.5 miles of a known bat hibernaculum or winter roost, and the work does not involve bridges, culverts, or other man-made structures that could serve as roosting sites. Although suitable forested summer habitat may be adjacent to the action areas, no trees will be removed as part of this activity.
Tricolored bat* (<i>Perimyotis subflavus</i>)	Primarily roost in leaf clusters of deciduous trees. Also utilize pine needles and artificial structures as roosts.	No effect. The spread of water chestnut will not affect the tricolored bat, or their habitats.	Furthermore, specific control measures will be implemented to minimize herbicide drift. The selected herbicide has limited toxicity to mammals and is not expected to bioaccumulate in the bats' insect-based diet. All spraying activities will be conducted during daytime hours to avoid any direct contact with foraging bats at night.

Species	Habitat Description	Effects from the No-Action Alternative	Effects from the Proposed Action
Indiana bat (<i>Myotis sodalis</i>)	Roosts under peeling bark of sun-exposed, dead or dying trees in various forested habitats. Maternity roosts are often found in canopy gaps or along forest edges. Forages in semi-open to closed forests. Males utilize a broader range of roosting sites.	No effect. The spread of water chestnut will not affect the Indiana bat or their habitats.	The 2026 locations do not overlap with the Indiana bat's habitat. USACE will assess effects should future water chestnut management activities extend into the Indiana bat's habitat.
Red-cockaded woodpecker (<i>Dryobates borealis</i>)	Prefer to excavate cavities in mature longleaf pines, often older than 80 years and infected with red heart disease. These cavity trees form clusters, averaging 10 acres, with actively used trees exhibiting flowing sap as a defense. Territories range from 125 to 200 acres, influenced by habitat and population density.	No effect. The spread of water chestnut will not affect the red-cockaded woodpecker or its habitat.	As discussed in Section 5.3.5.2, the risk of acute effects to birds from the proposed herbicides is expected to be low. Imazamox has been found to be essentially non-toxic to birds and mammals (WDNR, 2022b; USEPA, 2008). Flumioxazin is practically non-toxic to birds based on short-term exposure (WDNR, 2022b). Fluridone has not been shown to cause any short- or long-term effects to birds, while 2,4-D is moderately to practically non-toxic, and triclopyr is practically non-toxic to birds (WDNR, 2022c; Strid et al., 2018; WDNR, 2022e). Therefore, the project may affect but is not likely to adversely affect the red-cockaded woodpecker.

Species	Habitat Description	Effects from the No-Action Alternative	Effects from the Proposed Action
			The proposed 2026 locations do not overlap with the species' habitat. USACE will assess effects should future water chestnut management activities extend into the red-cockaded woodpecker's habitat.
Bog turtle <i>(Glyptemys muhlenbergii)</i> Eastern hellbender <i>(Cryptobranchus alleganiensis)</i>	Shallow, open-canopy wetlands with herbaceous vegetation, using both aquatic and terrestrial microhabitats. Hibernates in densely vegetated areas under roots, rock walls, or burrows. Perennial streams and rivers where they spend much of their time lying motionless under large, flat rocks.	The unmanaged spread of water chestnut could adversely affect these species by severely limiting light and reducing oxygen levels, as detailed in Section 5.3.6.1.	As discussed in Section 5.3.5.2, effects to amphibians and reptiles are expected to be insignificant for all proposed herbicides discussed as tax-specific toxicity data is not available (USEPA, 2008; USEPA, 2020). Based on this information, USACE has determined that the project may affect but is not likely to adversely affect the bog turtle and the eastern hellbender. The proposed 2026 locations do not overlap with these species' habitat. USACE will assess effects should future water chestnut management activities extend into the bog turtle or the eastern hellbender's habitats.
Maryland darter	Thrives exclusively in fast-	Invasive aquatic plants can be	Manual removal of water

Species	Habitat Description	Effects from the No-Action Alternative	Effects from the Proposed Action
<i>(Etheostoma sellare)</i>	flowing riffles where upland streams transition to the coastal plain.	beneficial to fish in the same way that natives are by providing surfaces for algae and small animals to live and by providing structure for cover and shelter (UF/IFAS, n.d.). However, invasive aquatic plants like water chestnut will often exceed densities of native aquatic vegetation while expanding into areas that do not contain natives at all. This can concentrate fish and wildlife into small areas of open water which exposes them to predators and limits their use of available habitat (UF/IFAS, n.d.).	chestnut has minimal adverse effects on fish. However, mechanical harvesting can harm fish that use water chestnut for shelter, food, or breeding, and removing dense mats of the plant can make smaller fish more vulnerable to predators. These effects will be temporary, and in the long run, water chestnut management will help fish populations by restoring native vegetation and preventing the negative effects of overgrowth. Herbicides considered in the proposed action are not expected to have significant, lasting adverse effects on fish, having passed comprehensive USEPA risk assessments for aquatic use. The proposed 2026 locations do not overlap with the species' habitat. USACE will assess effects should future water chestnut management activities extend into the darter's habitat.

Species	Habitat Description	Effects from the No-Action Alternative	Effects from the Proposed Action
Dwarf wedgemussel <i>(Alasmodonta heterodon)</i> Atlantic pigtoe <i>(Fusconaia masoni)</i> Yellow lance <i>(Elliptio lanceolata)</i> Green floater* <i>(Lasmigona subviridis)</i> Cumberland moccasin shell <i>(Medionidus conradicus)</i> Finerayed pigtoe <i>(Fusconaia cuneolus)</i> Fluted kidneyshell <i>(Ptychobranhus subtentus)</i> Shiny pigtoe <i>(Fusconaia cor)</i> Slabside pearlymussel <i>(Pleurionaia dolabelloides)</i> Tennessee clubshell <i>(Pleurobema oviforme)</i> Virginia fringed mountain snail <i>(Polygyriscus virginianus)</i>	Typically found on coarse to medium sands and sometimes in gravel substrates. Requires well oxygenated water free of pollutants. When they occur in larger streams and rivers, they are found in quieter pools and eddies, away from strong currents.	In areas where these clams and water chestnut coexist, the unmanaged spread of water chestnut could adversely affect the clams by severely limiting light and reducing oxygen levels, as detailed in Section 5.3.6.1.	Using the <i>USFWS Northeast Dkey</i>, USACE determined that there will be no effect to the green floater clam. Appendix B contains the results of the Dkey. This determination was based on several factors. The proposed action will not result in permanent changes to the quality, quantity, or timing of surface water or groundwater, will not create a new point source discharge, does not involve dredging or in-stream gravel mining, and will not involve the improper use of herbicides. Utilizing the green floater clam Dkey results and considering the similar habitat requirements of other clam species, USACE has determined that the proposed action will have no effect on these other clam species.

Species	Habitat Description	Effects from the No-Action Alternative	Effects from the Proposed Action
Rusty patched bumble bee (<i>Bombus affinis</i>)	Variety of habitats including prairies, woodlands, marshes agricultural landscapes, and residential parks and gardens. Nests are located in upland grasslands and shrublands.	No effect. The spread of water chestnut will not affect the rusty patched bumble bee or its habitat.	Based on the <i>USFWS Rusty Patched Bumble Bee Rangewide Dkey</i> , USACE determined that the project may affect, but is not likely to adversely affect the rusty patched bumble bee (Appendix B). This determination was based on several factors. The proposed action will not cause ground disturbance, surface flooding, or soil saturation within the bee's known habitat. It also avoids any negative impacts on native vegetation used by the bees. Furthermore, herbicides will not be used in areas identified as rusty-patched bumble bee habitat. Additionally, the project avoids broader activities that could pose a threat to native pollinators. This includes the planting or seeding of non-native plants, the implementation of native rodent control programs, and the use of commercially-managed bees (such as honeybees).

Species	Habitat Description	Effects from the No-Action Alternative	Effects from the Proposed Action
Monarch butterfly* (<i>Danaus plexippus</i>)	Fields, roadside areas, open areas, wet areas and urban gardens. Milkweed and flowering plants are required. Adult monarchs feed on the nectar of many flowers during breeding and migration, but they lay eggs on milkweed plants as that is the only food the caterpillars can eat.	No effect. The spread of water chestnut will not affect the monarch butterfly or its habitat.	Monarch butterflies are expected to be present in the project areas from May through September. The peak period to see monarchs in project areas is when they migrate through the region in large numbers from mid to late September (VADCR, 2022). The monarch has a specific host plant, milkweed, which provides the butterfly's larvae and caterpillars with food. Although not documented at the site, several species of milkweed could occur in the project areas (Bird Watching HQ, 2024). While milkweed is likely present in the project areas, the herbicides will only be applied to the aquatic water chestnut and will not be applied to terrestrial plants. Proper application methods to reduce chemical drift will be employed to mitigate the risk of adverse effects to non-target species. Therefore, USACE has determined that the proposed action will have no effect on the monarch butterfly.

Species	Habitat Description	Effects from the No-Action Alternative	Effects from the Proposed Action
Puritan tiger beetle (<i>Cicindela puritana</i>)	Narrow sandy beaches and eroding bluffs and cliffs.	The project site is a tidal pond adjacent to the Sassafras River. This area lacks the specific combination of sandy beaches and eroding cliffs required by the Puritan Tiger Beetle for its life cycle. Therefore, the no-action will have no effect on the species.	The proposed 2026 locations include a tidal pond adjacent to the Sassafras River. This area lacks the specific combination of sandy beaches and eroding cliffs required by the Puritan Tiger Beetle for its life cycle. Therefore, the proposed action will have no effect on the species. This determination was confirmed by the USFWS and MDDNR (Appendix B).
Hay's spring amphipod (<i>Stygobromus hayi</i>)	Shallow, dark, organic-rich groundwater habitats called hypotelminorheic zones. These perched aquifers are underlain by clay and feed into seepage springs. Forest cover is crucial, providing food, water quality regulation, and moderating water temperature.	In areas where these species and water chestnut coexist, the unmanaged spread of water chestnut could adversely affect the clams and snails by severely limiting light and reducing oxygen levels, as detailed in Section 5.3.6.1.	The herbicides considered for use may have varying degrees of acute risks to invertebrates. USEPA has determined that imazamox is virtually non-toxic to aquatic invertebrates (USEPA, 2008). Flumioxazin undergoes rapid degradation in water, light, and under microbial influence. However, direct exposure has been identified as moderately toxic to benthic species. Fluoridone is considered moderately toxic while the triethylamine salt variant of triclopyr is considered practically non-toxic to benthic species (WDNR, 2022c; Strid et al., 2018; WDNR, 2022e). Based on this information, USACE has determined that the project may affect but is not likely to

Species	Habitat Description	Effects from the No-Action Alternative	Effects from the Proposed Action
			adversely affect the Hay's spring amphipod and the Virginia mountain snail. The proposed 2026 project locations do not overlap with the species' habitat. USACE will assess effects should future water chestnut management activities extend into these species' habitats.
Northeastern Bulrush (<i>Scirpus ancistrochaetus</i>)	Grows in wet areas – small wetlands, sinkhole ponds or wet depressions with seasonally fluctuating water levels. It may be found at the water's edge, in deep water or in just a few inches of water, and during dry spells there may be no water visible where the plant is growing.	Without the preferred alternative, water chestnut will continue to spread throughout the water bodies where the species is present, outcompeting native aquatic vegetation such as American waterweed (<i>Elodea canadensis</i>) and pondweeds (<i>Potamogeton</i> spp.), which provide suitable food and habitat to native fish and wildlife species and their prey. Under the no-action alternative, the ecosystems of these water bodies would be severely negatively impacted.	The proposed action will have no effect on the northeastern bulrush. This determination is supported by the distinct habitat preferences of northeastern bulrush compared to the invasive water chestnut. Northeastern bulrush typically grows in shallow, wet areas, while water chestnut thrives in deeper water, making it unlikely for the two species to be found in the same location. As a precautionary measure, surveys will be conducted before any treatment activities. This will allow for the identification of any

Species	Habitat Description	Effects from the No-Action Alternative	Effects from the Proposed Action
			northeastern bulrush, ensuring they can be fully avoided during the treatment process.
Small whorled pogonia* (<i>Isotria medeoloides</i>)	Grows in older hardwood stands of beech, birch, maple, oak, and hickory that have an open understory. Sometimes it grows in stands of softwoods such as hemlock. It prefers acidic soils with a thick layer of dead leaves, often on slopes near small streams.		Using the <i>USFWS Northeast Dkey</i> , USACE determined that there will be no effect to the small whorled pogonia (Appendix B). This determination is based on several factors. The proposed action avoids direct harm to the plants by prohibiting the removal or mowing of any herbaceous native vegetation. Furthermore, the action will not cause any temporary or permanent modifications to local hydrology, such as altering ground recharge or constructing dams. This ensures there will be no adverse changes to water quality, quantity, or the timing of

Species	Habitat Description	Effects from the No-Action Alternative	Effects from the Proposed Action
			water availability. The action will not result in sedimentation in areas where the listed plants may be present.
Harperella (<i>Ptilimnium nodosum</i>) Swamp pink (<i>Helonias bullata</i>)	Grows in wet soils near a body of water and can survive periodic, moderate flooding. Requires an area that is perennially saturated but not flooded, with the water table at or near the surface. Found naturally in bogs, under shrubs, and in peaty soil.		The proposed 2026 locations do not overlap with the harperella or swamp pink habitats. Also, there are distinct habitat differences. Harperella typically grows in shallow, wet areas, and swamp pink grows in saturated areas while water chestnut thrives in deeper water, making it unlikely for the three species to be found in the same location. As a precautionary measure, surveys will be conducted before any treatment activities. This will allow for the identification of any harperella and swamp pink, ensuring they can be fully avoided during the treatment process. Should future water chestnut management activities extend into these species' habitats, USACE will assess effects should future water chestnut management activities extend into these species' habitats.

5.3.8 Air Quality

5.3.8.1 No Action

The no action alternative will have no impacts to air quality. The existence and spread of water chestnut is not anticipated to directly affect air quality over the short or long-term.

5.3.8.2 Proposed Action

The preferred alternative would have negligible temporary effects to air quality. Manual removal and herbicide treatment is generally accomplished by wading, kayak/canoe, or small boat. Mechanical harvesters (cutter harvesters and hydro-rakes) use diesel engines ranging from 100-200HP. Under the preferred alternative, herbicide treatment measures would be implemented using small boats such as a skiff with a 90HP four-stroke outboard engine or a 16-ft airboat with a 350HP motor. Boat and equipment operation associated with herbicide application or mechanical methods would lead to short-term, localized emissions of air pollutants, including suspended particulates, nitrogen dioxide, and carbon monoxide. These emissions, at local treatment sites and cumulatively across the Program, are not anticipated to cause any violations of state air quality standards, either in the short or long term. Management activities would not introduce any new stationary sources of emissions or contribute to violations of any federal, state, or local air quality regulations.

Herbicide applications will be carried out under optimal conditions and in strict accordance with product labels and the guidelines outlined in the General Permit (Section 5.1.2) conditions to minimize the risk of aerosolization and chemical drift. Herbicide treatments would follow best management practices to minimize environmental impacts. These include using additives to reduce evaporation and volatilization, selecting larger droplet-producing nozzles, and orienting nozzles to minimize spray drift. Applications would be restricted during wind speeds exceeding 10 miles per hour, and aerial spraying would not be conducted.

Localized emission increases will last only during limited treatment periods for sites identified under the Program (i.e., a few days per year) and monitoring period and end when the treatments and monitoring are over. Based on a qualitative assessment of equipment used, it is anticipated that impacts for the cumulative emissions of the Program will be below the de minimis thresholds for air quality impacts in tons per year for suspended particulates, nitrogen dioxide, and carbon monoxide under the Clean Air Act (40 CFR § 93.153(b)). The preferred alternative would have impacts below the de minimis threshold.

5.3.9 Historic and Archaeological Resources

5.3.9.1 No Action

Under the no action alternative, there would be no change in the current conditions within areas of proposed plant removal. Control of the water chestnut would not occur, and the plant would continue to inhabit and spread throughout surrounding areas. Cultural resources, if present, along water bodies could potentially be impacted by flooding and damage to banks and bank erosion if the water chestnut is allowed to spread.

5.3.9.2 Proposed Action

Impacts to cultural resources are not anticipated from the preferred alternative.

For the proposed 2026 treatment sites, twenty-eight cultural resources have been previously identified within the aquatic plant removal areas (Section 3.9); however, the proposed methods of removal (herbicide application, manual removal, and mechanical harvesting) are not anticipated to impact any aspects of integrity or character-defining features that contribute to the resources' significance. The proposed removal methods are localized to the water chestnut sites and no bottom or visual disturbance is anticipated. Site access and staging areas, if any, will be coordinated with the MHT, VDHR, and Tribal Nations, as appropriate, to avoid historic and archaeological resources and utilize previously disturbed areas.

For management actions proposed for 2026, the SHPO made a no adverse effects determination (Appendix B). For future management actions at locations different from the sites where work is proposed to occur in 2026, USACE will conduct an evaluation of the Area of Potential Effect (APE) to identify cultural resources and conduct coordinate with the appropriate SHPO and relevant stakeholders to determine what is required to evaluate the activity under Section 106 of the NRHP.

5.3.10 Recreation and Aesthetics

5.3.10.1 No Action

The continued proliferation of water chestnut within the program area's water bodies would result in adverse effects on recreational activities. This includes reduced access for boating and fishing, and a diminished aesthetic quality, leading to a less than optimal recreational experience. Once established, floating aquatic invasive plants can form dense mats on the surface of water bodies, discouraging in-water recreation such as boating, swimming, water skiing, jet skiing, and fishing. Further, these dense mats of vegetation can be impossible to pass through and can foul water intakes, damaging boat motors. Boat launches along these water bodies would be blocked and may need to close. Swimming would be undesirable through vegetation choked waterways. The spread of water chestnut and the dense mats it forms decrease the aesthetic value of these water bodies. Additionally, the sharp spines on the fruit of the water chestnut can cause injuries.

5.3.10.2 Proposed Action

Impacts to recreation are expected to be less than significant from manual removal. Short-term impacts to recreation would result from the preferred alternative as sections of the water body may be closed during mechanical removal and herbicide treatment activities for public safety. The impacts are expected to be minimal and temporary, as treatment areas will likely be relatively small and will be reopened once the treatments are complete and herbicide concentration levels are safe to resume recreational activities, including swimming and fishing.

The long-term manual, mechanical, and chemical control of water chestnut is anticipated to have positive effects on recreation and aesthetics by decreasing water chestnut population sizes, shrinking current patches and mats of water chestnut within the water body and contribute to the prevention of the spread, maintaining and reopening access to the water body

for water-based recreational activities. The aesthetic value of water bodies will be improved and resemble its previous condition prior to the introduction of water chestnut.

5.3.11 Noise

5.3.11.1 No Action

Under the no action alternative, there would be no impacts to the noise environment.

5.3.11.2 Proposed Action

Cutter harvesters and hydro-rakes use engines ranging from 100-200HP, with noise levels like a lawn mower or chainsaw. Under the preferred alternative, herbicide treatment measures will be implemented using small boats, such as a skiff with a 90HP four-stroke outboard engine or a 16-foot airboat with a 350HP motor. Low density target plant areas will consist of application with a backpack sprayer with manual or battery-powered pump.

The noise levels from the treatment equipment are expected to be around 100 decibels and will only occur during treatment operations and will be limited to the immediate vicinity. Post-treatment monitoring would be performed from Jon boats with appropriate engines, that would be similar to recreational vessels that may be in the area. The addition of the monitoring vessels to each site for the duration of treatment and monitoring activities is not expected to significantly increase the noise above baseline conditions. Noise impacts from the equipment used to treat the invasive aquatic plants would be less than significant and short-term and would cease after invasive management methods and monitoring activities are complete. There would be no long-term impacts to noise levels associated with the preferred alternative.

6 Agency, Tribal, and Public Coordination

A 30-day Public Notice describing the preferred alternative will be published to allow for public and agency comment. Appendix B contains supporting documentation that was collected during preparation of this EA. Coordination was conducted with the agencies below by USACE and/or MWCOG for preparation of this EA. As additional locations are observed to contain water chestnut and two horned water chestnut, additional coordination will be conducted by MWCOG when performing management measures to ensure compliance with state and local environmental laws, regulations, and permits.

Federal (coordination by USACE):
U.S. Environmental Protection Agency
U.S. Fish and Wildlife Service
NOAA Marine Fisheries Service

Virginia (coordination by MWCOG):
Virginia Department of Agriculture
Virginia Department of Wildlife
Northern Virginia Soil and Water Conservation District
Northern Virginia Regional Park Authority (NOVA Parks)
Fairfax County Department of Public Works, Virginia
Fairfax County Public Schools, Virginia
City of Manassas, Virginia

Maryland (coordination by MWCOG):
Maryland Department of Natural Resources
City of Greenbelt, Maryland

Section 106 Consultations including Tribal Nations (coordination by USACE):
Maryland Historical Trust
Virginia Department of Historic Resources
Baltimore County, Maryland
Fairfax County, Virginia
Loudoun County, Virginia
Prince William County, Virginia
Catawba Indian Nation
Chickahominy Tribe Eastern Division
Delaware Nation
Delaware Tribe of Indians
Eastern Shawnee Tribe of Oklahoma
Monacan Indian Nation
Seneca-Cayuga Nation
Pamunkey Indian Tribe

7 Environmental Compliance

This section describes the Federal laws, regulations and programs that are relevant to the program and preferred alternative (Table 7-1 and 7-2).

Law or Regulation	Compliance with Regulation/Law
Bald and Golden Eagle Protection Act (BGEPA)	Bald eagle nests are currently present within the project boundary, and additional nesting sites are expected to be established. This study specifically addresses the management of an invasive species and does not involve any direct harm or disturbance to Bald or Golden Eagles. As outlined in Section 5.3.5, the use of herbicides is anticipated to have minimal impact on avian species.
Clean Air Act (CAA)	Emissions from the preferred alternative will be below the de minimis levels in any one year. Negligible, temporary emissions during treatment will occur.
Clean Water Act (CWA)	The preferred alternative contains herbicides that have been approved by the USEPA for aquatic application. Minor, temporary impacts will occur during and immediately following application. Activities will be conducted in accordance with the relevant jurisdiction NPDES General Permit. Prior to application, state water quality certification will be required.
Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)	N/A. The application of the herbicides is not a spill of a waste subject to CERCLA because they are being properly applied per label. Such activity falls under FIFRA. None of the initial sites proposed for treatment have been listed as Superfund sites. Futures sites will be evaluated to ensure there are no CERCLA impacts or compliance issues.
Endangered Species Act (ESA)	The preferred alternative will have no effect on the green floater clam, the small whorled pogonia, the monarch butterfly, or the puritan tiger beetle. The preferred alternative may affect but is not likely to adversely affect the northern long-eared bat and the tricolored bat. The USFWS Virginia ESFO responded on February 9, 2026, stating they had no comments on the determination. The Chesapeake Bay ESFO responded on February

Law or Regulation	Compliance with Regulation/Law
	11, 2026, with one comment on a proposed 2026 site located in the Sassafras River, and its potential effects on the puritan tiger beetle. After supplying USFWS with additional information, it was determined by both USFWS and MDDNR that work in the Sassafras River site will have no effect on the beetle (emails included in Appendix B).
Farmland Protection Policy Act (FPPA)	The preferred alternative will have no effects on prime farmland or farmland of statewide importance. To ensure there will be no effect, coordination would occur with land owners/farmers if water from a treated water body is used for irrigation purposes.
Federal Insecticide, Fungicide and Rodenticide Act (FIFRA)	All herbicides utilized in the preferred alternative are registered for aquatic use by USEPA and Maryland, DC, and Virginia and will be applied by register applicators and used only as directed via product label.
Migratory Bird Treaty Act (MBTA)	There would be no taking of any migratory or protected avian species with the preferred alternative. Minor impacts to birds could occur, but herbicides are considered generally non-toxic to birds.
Fish and Wildlife Coordination Act (FWCA)	The preferred alternative will not modify a waterbody which would result in the loss and/or damage to fish and wildlife resources, other than the management of the invasive water chestnut. No FWCA Report necessary.
National Environmental Policy Act (NEPA)	This document to meet the compliance requirements of NEPA of 1969, as amended, and follows the Department of Defense NEPA Implementing Regulations issued on June 30, 2025.
National Historic Preservation Act (NHPA)	Coordinated with the SHPO and American Indian Tribes was conducted on 15 January 2026 via letter to fulfill requirements. The SHPO responded with a no adverse effects determination on March 16, 2026 (Appendix B).
Noise Control Act	With the preferred alternative, temporary and minimal noise increases would occur during treatment, within daylight hours.

Law or Regulation	Compliance with Regulation/Law
Resource Conservation and Recovery Act (RCRA)	The herbicides used are not a waste and will be properly applied per label instructions. Such activity falls under FIFRA. If disposal of any hazardous waste is required, it will be completed in compliance with RCRA.
River and Harbors Act (RHA)	N/A. The preferred alternative does not include dredging or disposal of dredged materials.
National Invasive Species Act (NISA)	This program focuses on the management of an invasive aquatic plant species. The program will not promote or cause the introduction or spread of invasive species into waters of the United States.
Water Project Recreation Act (WPRA)	This program is centered on the management of an invasive species, with the goal of improving the quality of waters of the United States, as well as addressing current or future water bodies identified as impaired within the study area.
Wild and Scenic Rivers Act (WSRA)	This program is focused on managing an invasive species to enhance free-flowing rivers that possess natural, cultural, and recreational values. There are no bodies of water proposed for treatment that have been listed by WSRA.

Table 7-2: Compliance of the Preferred Alternative with Applicable Executive Orders

Executive Order Content and Number	Demonstration of Compliance
EO 11514 Protecting and Enhancing Environmental Quality	The preferred alternative involves the removal of the invasive water chestnut, which would promote the recovery and diversity of native plant species. This action is expected to enhance overall environmental quality.
EO 11593 Protection and Enhancement of Cultural Environment	Coordination conducted with the State Historic Preservation Officer by letter dated 16 January 2025.
EO 11988 Floodplain Management	Public notice of the availability of this report or public review fulfills the requirements of Executive Order 11988, Section 2(a)(2). The proposed activity does not include development in a floodplain. Herbicides will be applied by a licensed applicator will follow best management practices. As a result, there would be no impacts to adjacent floodplains
EO 11990 Protection of Wetlands	This program does not include construction in wetlands and preserves and enhances the value of these natural systems by managing invasive aquatic plants.
EO 13007 Indian Sacred Sites	Coordination with tribal interests occurred by letter on January 15, 2026.
EO 13045 Protection of Children from Environmental Health Risks and Safety Risks	The program will not create a disproportionate environmental health or safety risk for children.
EO 13112 Invasive Species	The preferred alternative involves removing managing the invasive water chestnut, thereby promoting ecological diversity within the managed water bodies.
EO 13186 Migratory Birds	Preferred actions will not have a negative impact to migratory birds or their habitat. Minor impacts to birds could occur, but herbicides are considered generally non-toxic to birds.
EO 13508 Chesapeake Bay Watershed	This program will improve the Chesapeake Bay Watershed by improving water quality with the eradication of water chestnut. The

	program will not hinder the goals of the Chesapeake Bay Agreement.
EO 13751 Safeguarding the Nation from the Impacts of Invasive Species	Will be addressed by implementing best management practices during treatment operations including equipment specifications and methods to reduce spread of invasive species.

8 Recommendation

Based on the information evaluated in this Programmatic EA, Alternative 2, Cost-Shared Management, is the recommended alternative. This alternative includes entering a cost-sharing agreement (Project Partnership Agreement) with MWCOG to manage water chestnut through the application of manual methods, mechanical means, and herbicide application.

The selection of this alternative provides the means to reduce water chestnut populations and control the probability of population expansion through rapid response and detection. These measures will help to prevent the impact of infestations to infrastructure, health and safety, and the environment.

In view of these findings, and under the authority of Section 104 of the Rivers and Harbor Act of 1958 (33 United States Code [U.S.C.] §610), as amended, I recommend that USACE enter into an agreement with the Metropolitan Washington Council of Governments to cost-share the management of water chestnut in Maryland, the District of Columbia, and Virginia.

Date

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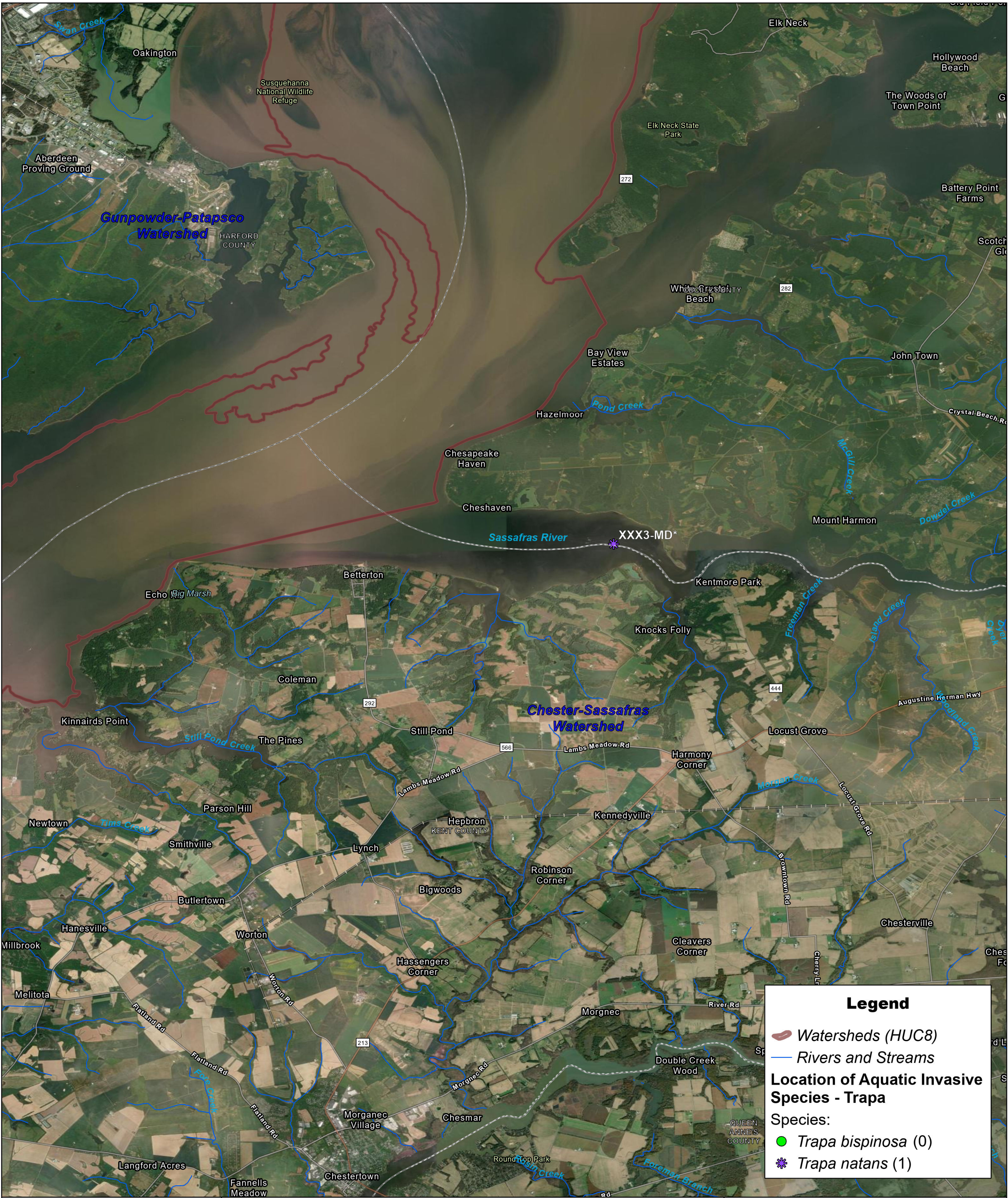
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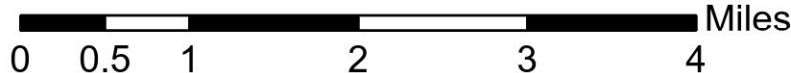
**Aquatic Plant Control Program for Water Chestnut Management in
Maryland, Washington, D.C., and Virginia
Programmatic Environmental Assessment**

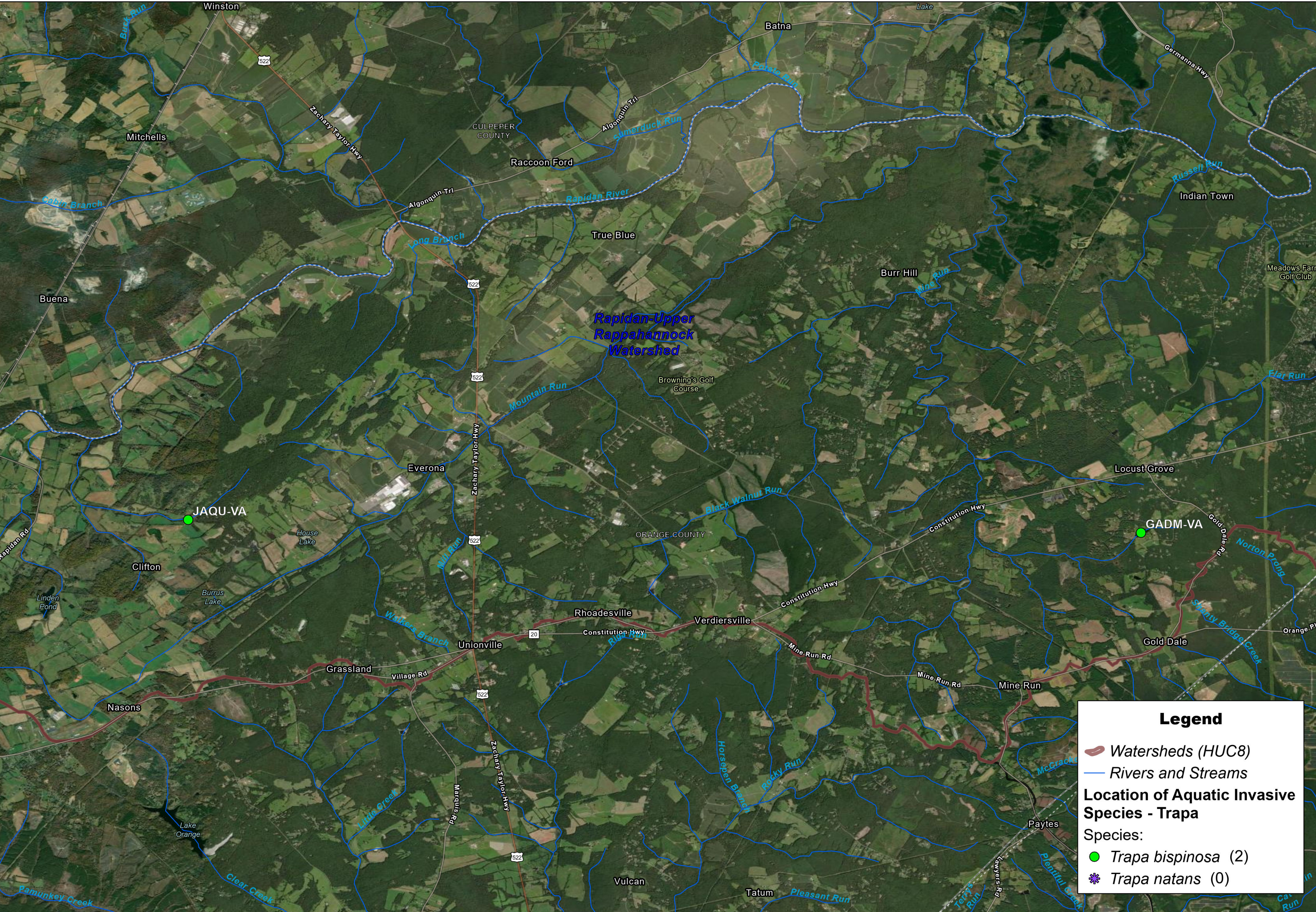
APPENDIX A – HYDROLOGIC MAPS



US Army Corps
of Engineers®
Baltimore District

Location of Aquatic Invasive Species -
Water Chestnut (Trapa) in the
Chester-Sassafras Watershed in Maryland





Legend

Watersheds (HUC8)

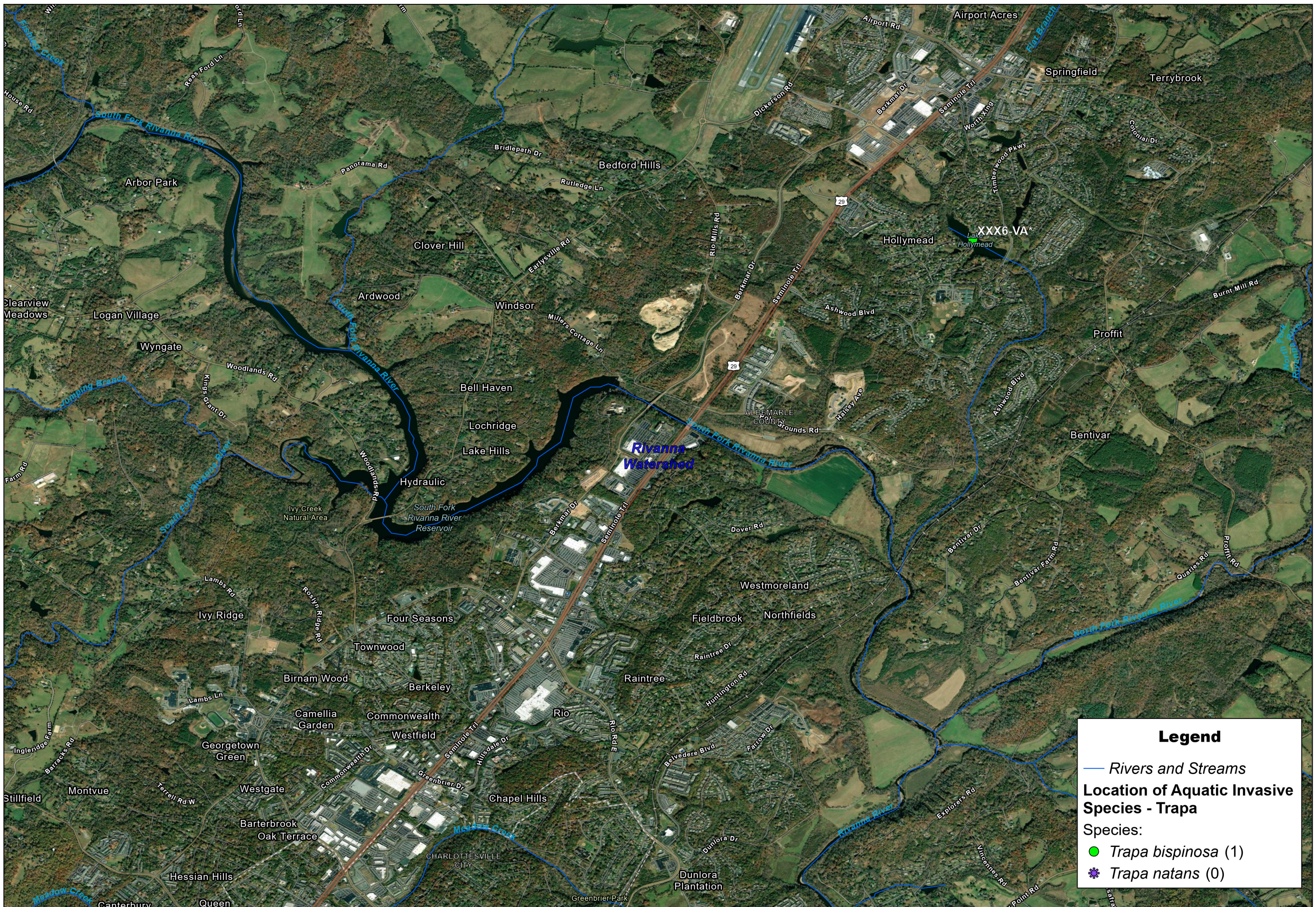
Rivers and Streams

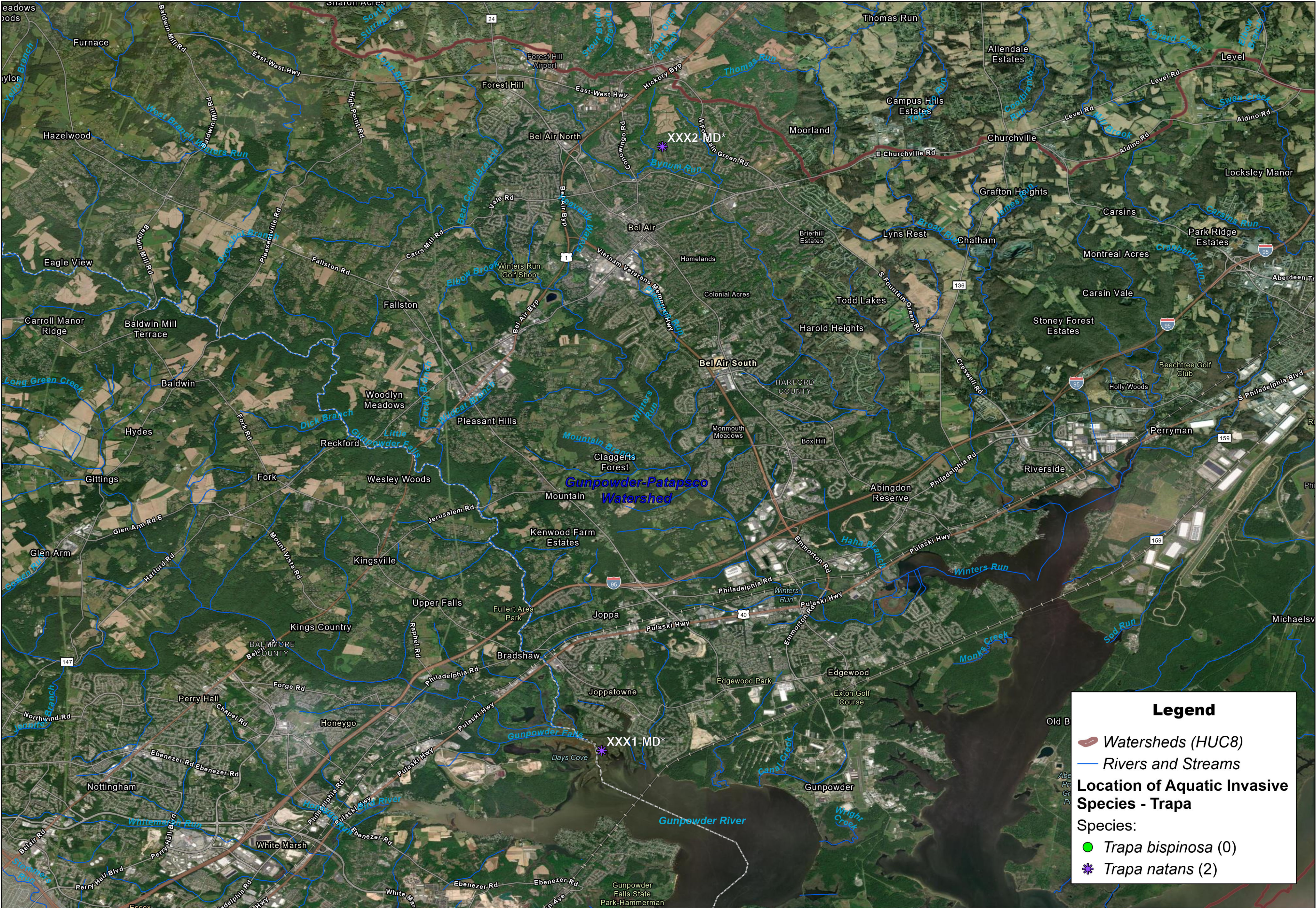
Location of Aquatic Invasive Species - Trapa

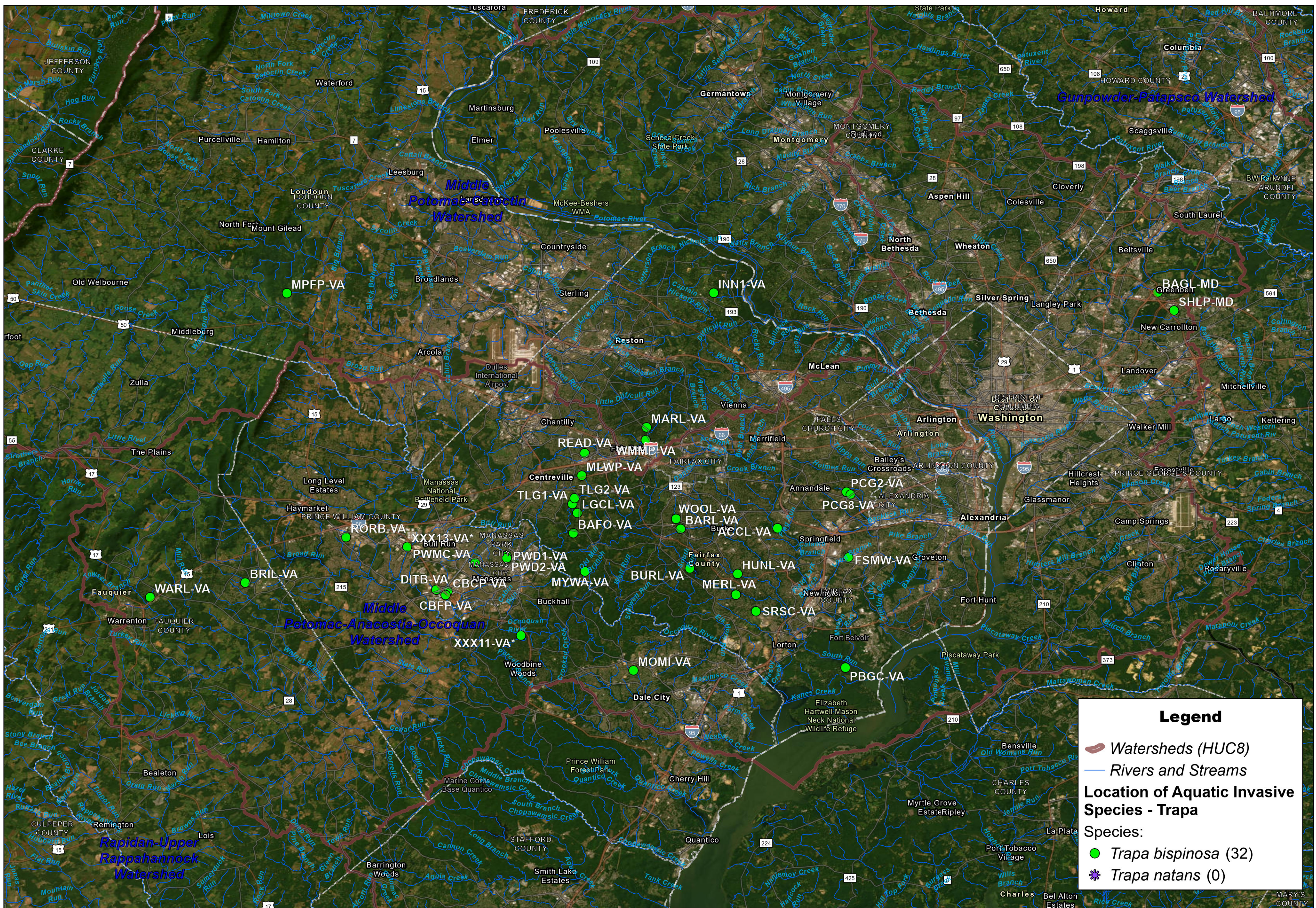
Species:

- Trapa bispinosa* (2)
- Trapa natans* (0)









Legend

Watersheds (HUC8)

Rivers and Streams

Location of Aquatic Invasive Species - Trapa

Species:

- Trapa bispinosa* (32)
- Trapa natans* (0)

**Aquatic Plant Control Program for Water Chestnut Management in
Maryland, Washington, D.C., and Virginia
Programmatic Environmental Assessment**

APPENDIX B - COORDINATION



US Army Corps
of Engineers
Baltimore District

PUBLIC NOTICE

Draft Integrated Letter Report and Programmatic Environmental Assessment for Water Chestnut Management in Maryland, Washington D.C., and Virginia

March 23, 2026

The U.S. Army Corps of Engineers, Baltimore District (USACE), is releasing a draft Integrated Letter Report and Programmatic Environmental Assessment (EA) for the long-term, regional management of the invasive water chestnut. Federal participation in this action is through the USACE Aquatic Plant Control Program. The draft EA evaluates the potential environmental effects of managing two invasive aquatic plants, including the two-horned water chestnut (*Trapa bispinosa*) and the Eurasian water chestnut (*Trapa natans*), throughout Maryland, Washington, D.C., and Virginia.

The draft EA has been prepared in accordance with the National Environmental Policy Act of 1969 (NEPA), as amended. Under the proposed federal action, USACE would enter into a cost-shared agreement with the Metropolitan Washington Council of Governments (MWWOG), the non-federal sponsor, to support ongoing management of these species. Management measures would include manual removal, mechanical harvesting, and targeted herbicide applications to reduce the spread of the invasive plants. Implementation of management activities is anticipated to begin in the summer of 2026.

Adverse impacts to local residents and recreational users at affected water bodies targeted for this work are anticipated to be minimal and temporary. In the long term, the work will have positive effects by reducing the spread of water chestnut, enhancing access for recreational activities, and improving water quality and aquatic habitat within affected water bodies. Based on the preliminary findings in the draft EA, USACE prepared a draft Finding of No Significant Impact (FONSI) located in the referenced draft document.

The draft Integrated Letter Report and Programmatic EA as well as the draft FONSI will be available for public review at the following website:

<https://www.nab.usace.army.mil/Missions/Environmental/Two-Horned-Water-Chestnut/>.

Comments may be submitted using the fillable form available on the website, or by emailing the project manager, Jacqueline Seiple, at jacqueline.a.seiple@usace.army.mil. Public comments will be accepted for 30 days from the date of this notice.

Daniel Bierly, P.E.
Chief, Civil Project Development Branch
Planning Division

**Aquatic Plant Control Program for Water Chestnut Management in Maryland, Washington, D.C., and
Virginia**

Programmatic Environmental Assessment

APPENDIX B – COORDINATION

Coordination Table

Date	Agency	Correspondence Type	Response
12/21/25	U.S. Fish and Wildlife (USFWS)	USFWS Information for Planning and Consultation (IPaC)	List of threatened and endangered species (enclosed)
12/21/25	USFWS	IPaC	Results of the Northeast Determination Key (enclosed)
12/21/25	USFWS	IPaC	Results of the Northern Long-eared Bat and Tricolored Bat Determination Key (enclosed)
1/14/26	USFWS Virginia Field Office	Self-Certification Letter and Review Package (enclosed)	2/9/26 response – no comments (enclosed)
1/16/26	Virginia Department (Dept.) of Historic Resources	Section 106 National Historic Preservation Act (NHPA) Coordination Letter (Section 106 Letter)	2/20/26 letter requesting additional information (enclosed) No Adverse Effect response on 3/16/26 (enclosed)
1/16/26	Maryland Historical Trust	Section 106 Letter	

Date	Agency	Correspondence Type	Response
1/16/26	Baltimore County Dept. of Planning	Section 106 Letter	No response received.
1/16/26	Cecil County Historic District Commission	Section 106 Letter	No response received
1/16/26	Prince William County Dept. of Planning	Section 106 Letter	No response received
1/16/26	Fairfax County Dept. of Planning and Development	Section 106 Letter	No response received
1/16/26	Fauquier County Dept. of Planning	Section 106 Letter	No response received
1/16/26	Albemarle County Dept. of Planning	Section 106 Letter	No response received
1/16/26	Kent County Dept. of Planning, Housing, and Zoning	Section 106 Letter	No response received
1/16/26	Harford County Dept. of Planning and Zoning	Section 106 Letter	No response received
1/16/26	Orange County Dept. of Planning and Zoning	Section 106 Letter	No response received
1/16/26	Loudoun County Dept. of Planning and Zoning	Section 106 Letter	No response received
1/16/26	Seneca Cayuga Nation	Section 106 Letter	No response received
1/16/26	Monacan Indian Nation	Section 106 Letter	No response received
1/16/26	Pamunkey Indian Tribe	Section 106 Letter	No response received

Date	Agency	Correspondence Type	Response
1/16/26	Eastern Shawnee Tribe of Oklahoma	Section 106 Letter	No response received
1/16/26	Delaware Tribe of Indians	Section 106 Letter	No response received
1/16/26	Delaware Nation	Section 106 Letter	No response received
1/16/26	Chickahominy Tribe Eastern Division	Section 106 Letter	No response received
1/16/26	Catawba Indian Nation	Section 106 Letter	No response received
2/11/26	USFWS Chesapeake Bay Field Office / Maryland Department of Natural Resources (DNR)	Self-Certification Letter and Review Package	2/18/26 – USFWS and DNR responses – no effect on listed species (enclosed)
2/12/26	USFWS	IPaC	Results of Rusty Patched Bumble Bee Range Wide Determination Key (enclosed)
3/4/26	Northern Virginia Soil and Water Conservation District	Email sent by the Sponsor (enclosed)	Email Response on 3/6/26 (enclosed)

Coordination documents not included in this appendix are available upon request.



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Virginia Field Office
6669 Short Lane
Gloucester, VA 23061



Date: 1/14/26

Self-Certification Letter

Project Name: Federal Participation in the Aquatic Plant Control Program for Water Chestnut N

Dear Federal Action Agency:

Thank you for using the U.S. Fish and Wildlife Service (Service) Virginia Ecological Services online project review process. By submitting this letter, in conjunction with your project review package to our office for review, you are certifying that you have completed the online project review process for the project named above in accordance with all instructions provided, using the best available information to reach your determinations. From the date of receipt, our office has 60 days (50 CFR § 402.13(c)(2)) to review your project package. If we do not concur with the Section 7 determination(s) provided or if we have any questions/concerns regarding the information provided, you will be contacted. If you are not contacted during the 60-day review period, this letter and your project review package complete the review of your project in accordance with the Endangered Species Act (16 USC 1536), as amended (ESA). This letter also provides information for your project review under the National Environmental Policy Act of 1969 (P.L. 91-190, 42 USC 4321-4347, 83 Stat. 852), as amended. A copy of this letter and the project review package must be submitted to this office by the Federal action agency or their officially designated non-federal representative (per 50 CFR 402.08) for this self-certification letter to be valid. This letter and the project review package will be maintained in our records.

The ESA Section 7 Determination Table in the enclosed project review package summarizes your ESA analyses and determinations. These analyses resulted in a “no effect” and/or a “may affect, not likely to adversely affect” determination for proposed/listed species and/or proposed/designated critical habitat.

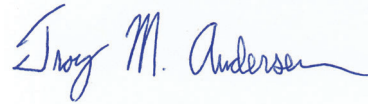
The use of the online project review process in strict accordance with the instructions provided as documented in the enclosed project review package resulted in reaching the appropriate determinations. Therefore, we concur with the not likely to adversely affect determination(s) for proposed/listed species and proposed/designated critical habitat provided in the ESA Section 7 Determination Table.

Should project plans change, surveys expire, or information on the distribution or status of proposed/listed species and/or proposed/designated critical habitat become available/change, this letter is no longer valid and you must submit an updated project package.

Note that under 50 CFR 402.12(e) of the regulations implementing Section 7 of the ESA, the accuracy of official species lists should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information.

Information about the online project review process including instructions and use, species information, and other information regarding project reviews within Virginia is available on our website (<https://www.fws.gov/office/virginia-ecological-services/virginia-field-office-online-review-process>). If you have any questions, please contact Troy Andersen of this office at (804) 728-0695.

Sincerely,

A handwritten signature in blue ink that reads "Troy M. Andersen". The signature is fluid and cursive, with a long horizontal flourish at the end.

Troy Andersen
Acting Field Supervisor
Virginia Ecological Services

Enclosures - project review package

Federal Participation in the Aquatic Plant Control Program for Water Chestnut Management in
Maryland, Washington, D.C., and Virginia

U.S. Army Corps of Engineers, Baltimore District

PROJECT REVIEW PACKAGE

Proposed Project and Project Areas

The proposed project is to manage the introduction, spread, and impacts of the invasive aquatic plant species *Trapa bispinosa* (two-horned water chestnut) and *Trapa natans* (European water chestnut) within the waters of Maryland, Virginia, and the District of Columbia (DC). The project is a federal cost-shared effort with the Metropolitan Washington Council of Governments (MWCOG) under the U.S. Army Corps of Engineer's (USACE) aquatic plant control program. As the non-federal sponsor for this project, MWCOG is representing state and local agencies within portions of Maryland, Virginia, and DC where water bodies have been identified as containing occurrences of two-horned water chestnut, primarily and, Eurasian water chestnut, secondarily. Eurasian water chestnut occurs throughout the region, whereas two-horned water chestnut is limited mainly to a few large populations around the Washington D.C. Metropolitan Area. Jurisdictions currently affected by two-horned water chestnut are shown in Figure 1 and Table 1. The National Environmental Policy Act (NEPA) documentation (Programmatic Environmental Assessment) will cover future infestations that could occur via spread of this invasive species within Maryland, Virginia, and DC.

The proposed project includes a suite of management methods that could be used alone or in combination to reduce the populations and spread of these two species of water chestnut, and to enable rapid response to new infestations. Management methods include:

- Manual removal of water chestnut by hand-pulling localized populations of plants, accessed by wading or small boats.
- Mechanical management of water chestnut through the use of mechanical harvesters, such as a cutters or hydro-rakes. This method includes cutting, pulling, or tilling to eliminate unwanted vegetation. Mechanical harvesting is most effective in densely invaded areas (>25% water chestnut surface area coverage), where plants are growing in mats.
- Chemical treatment of water chestnut with herbicides registered and licensed for aquatic use by the U.S. Environmental Protection Agency and covered by General Permits for aquatic pesticide use in Maryland, Virginia, and Washington D.C. Herbicides used for treatment will primarily include imazamox, flumioxazin, 2,4-D, trichlopyr, and fluridone, although other licensed herbicides proven effective for water chestnut treatment could be used in future management efforts.

Implementation of management measures by MWCOG is scheduled to begin in the summer of 2026 and will initially target 42 water bodies within Virginia and Maryland (Table 2 and Figure 2). The

treatment of water chestnut under a cost-share agreement will continue into future years as funding becomes available to manage the spread of these invasive aquatic plants.

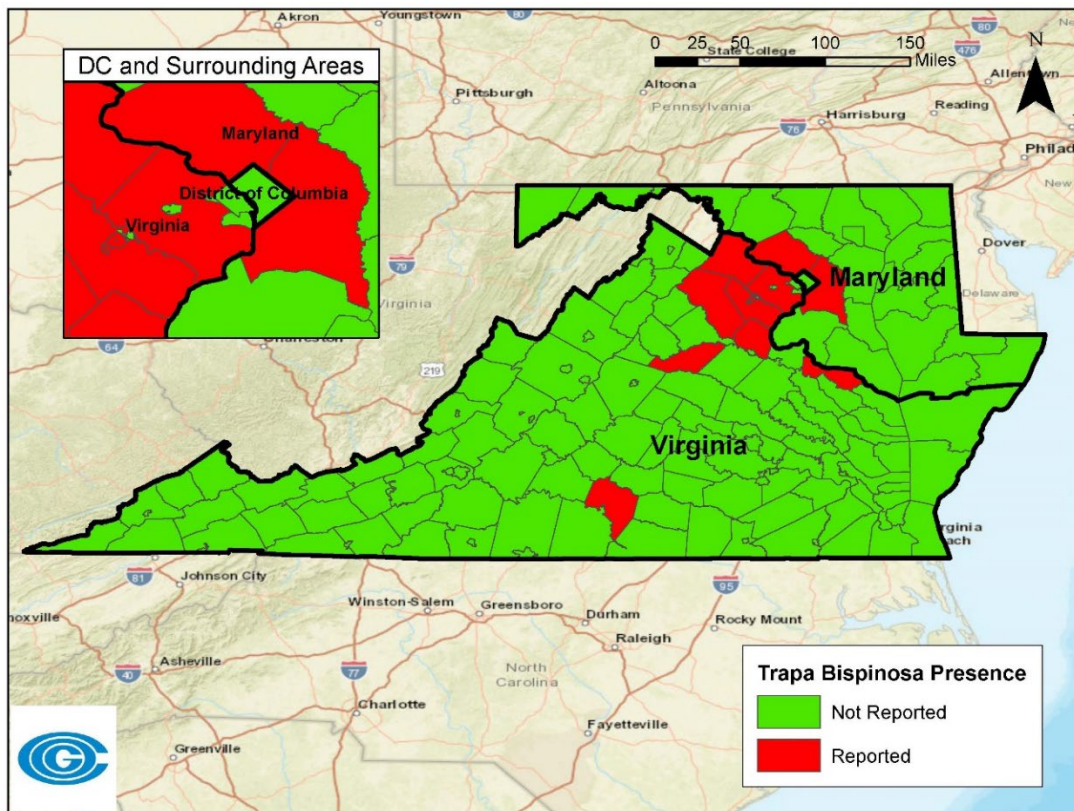


Figure 1: Project area and presence of two-horned water chestnut by County.

Table 1: Locations of water bodies currently infested by two-horned water chestnut in the Maryland, Virginia, and the District of Columbia.

Watershed (HUC 8)	County, State	Observations
Middle Potomac-Catoctin (02070008)	Montgomery, MD	2
Middle Potomac-Catoctin (02070008)*	Fairfax, VA	51
Middle Potomac-Catoctin (02070008)*	Loudoun, VA	3
Middle Potomac-Anacostia-Ococoquan (02070010)*	Prince George's, MD	39
Middle Potomac-Anacostia-Ococoquan (02070010)*	Fairfax, VA	235
Middle Potomac-Anacostia-Ococoquan (02070010)*	Fauquier, VA	30
Middle Potomac-Anacostia-Ococoquan (02070010)*	Manassas, VA	3
Middle Potomac-Anacostia-Ococoquan (02070010)*	Manassas City, VA	10
Middle Potomac-Anacostia-Ococoquan (02070010)*	Prince William, VA	60
Lower Potomac (02070011)	Prince William, VA	3
Lower Potomac (2070011)	Stafford, VA	1
Lower Potomac (2070011)	Westmoreland, VA	1
Rapidan-Upper Rappahannock (2080103)	Fauquier, VA	1
Rapidan-Upper Rappahannock (2080103)*	Orange, VA	4
Pamunkey (2080106)	Orange, VA	1
Middle Roanoke (3010102)	Charlotte, VA	5

*Watersheds that include locations that will be managed in 2026 (see Table 2). Note that the Rivanna Watershed (02080103) also has locations that will be managed in 2026, but these are newer observations that are awaiting ID assignments by the U.S. Geological Survey, so are not shown in this table.

Table 2: Water bodies targeted for management efforts in summer 2026.

Watershed (HUC8)	County, State	Species	No. of Sites to be Managed
Chester-Sassafras (02060002)	Cecil County, MD	T. natans	1
Gunpowder-Patapsco (02060003)	Harford County, MD	T. natans	2
Middle Potomac-Anacostia-Ococoquan (02070010)	Fairfax County, VA	T. bispinosa	18
Middle Potomac-Anacostia-Ococoquan (02070010)	Fauquier County, VA	T. bispinosa	2
Middle Potomac-Anacostia-Ococoquan (02070010)	Manassas City, VA	T. bispinosa	5
Middle Potomac-Anacostia-Ococoquan (02070010)	Prince Georges County, MD	T. bispinosa	2
Middle Potomac-Anacostia-Ococoquan (02070010)	Prince William County, VA	T. bispinosa	5
Middle Potomac-Catoctin (02070008)	Fairfax County, VA	T. bispinosa	3
Middle Potomac-Catoctin (02070008)	Loudon County, VA	T. bispinosa	1
Rivanna (02080204)	Albemarle County, VA	T. bispinosa	1
Rapidan-Upper Rappahannock	Orange County, VA	T. bispinosa	2

(02080103)			
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Under the USACE Aquatic Plant Control Program, cost-shared management of aquatic invasive plant species cannot be provided for management of species in waters that are not publicly accessible nor are Waters of the U.S. or adjacent to Waters of the U.S. Waters of the U.S. are defined under 33 CFR 328.3. All water bodies were screened to ensure that these cost-share criteria were met.

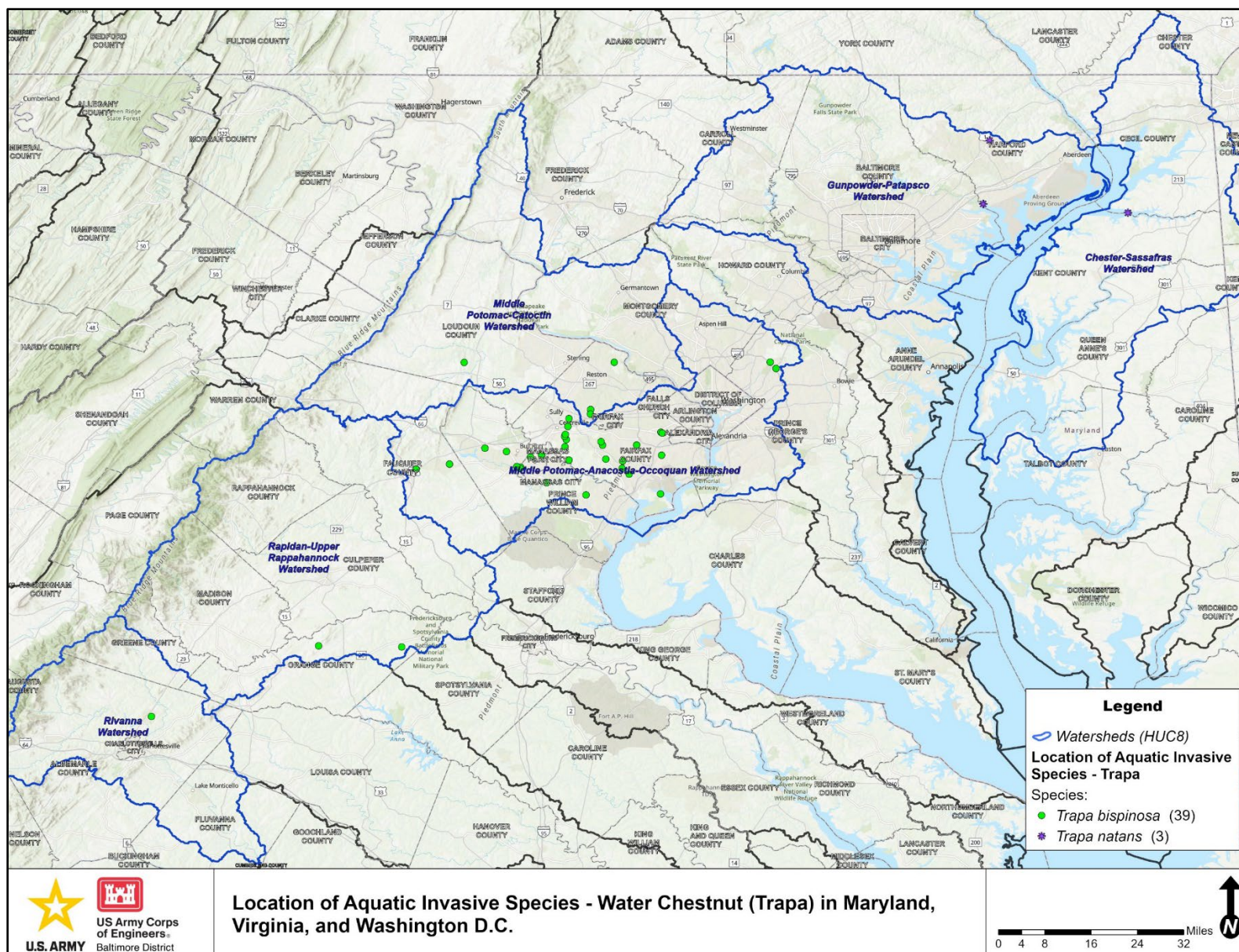


Figure 2: Locations targeted for management efforts in summer 2026.

Listed Species in the Project Areas

In accordance with Section 7 of the Endangered Species Act (ESA), the USFWS IPaC tool was used to identify federally listed species that may occur within the broader project area (VA, MD, and DC) or that may be affected by the proposed project. The initial IPaC species list was refined based on habitats associated with the proposed action (including waterways, ponds, lakes, wetlands, and forests).

The broader project area may provide suitable habitat for 3 mammals, 1 bird, 1 reptile, 1 amphibian, 1 fish, 10 clams, 1 snail, 2 insects, 1 crustacean, and 5 plant species (Table 3), all of which are either federally listed as endangered or threatened or are proposed for such listing. Table 3 also provides their state status. Critical habitat for the Maryland darter (*Etheostoma sellare*), Atlantic pigtoe (*Fusconaia masoni*), yellow lance (*Elliptio lanceolata*), and the rusty patched bumble bee (*Bombus affinis*) overlaps the broader project area.

An asterisk indicates species that may occur and/or may be affected by the 2026 management activities. Since *Trapa bispinosa* and *Trapa natans* typically thrive in freshwater habitats, listed species under the jurisdiction of the National Marine Fisheries Service (NMFS) are not included in Table 3.

Table 3. Federally listed species in the broader project area that may be affected by the proposed action.

Species	Federal Listing Status/Proposed for Listing	State Status	Location and Time of Year in Project Area (VA, MD, DC)	Habitat Description
Mammals				
Indiana bat (<i>Myotis sodalis</i>)	Endangered	Endangered (VA), species of greatest conservation need [SGCN] (MD)	Primarily in the western portion of MD and VA, and in Caroline County, VA during the summer.	Roosts under peeling bark of sun-exposed, dead or dying trees in various forested habitats. Maternity roosts are often found in canopy gaps or along forest edges. Forages in semi-open to closed forests. Males utilize a broader range of roosting sites.
Northern long-eared bat* (<i>Myotis septentrionalis</i>)	Endangered	Endangered (VA, MD), SGCN (DC)	Throughout MD, VA, and DC in the spring, summer, and fall.	Roosts under bark, in cavities, or crevices of trees and sometimes structures, utilizing both live and dead trees. Exhibit flexible roost selection based on tree suitability and rely on forested areas for roosting, foraging, and commuting.
Tricolored bat* (<i>Perimyotis subflavus</i>)	Proposed endangered	Endangered (VA), SGCN and highly state rare (MD)	Throughout MD, VA, and DC in the spring, summer, and fall.	Primarily roosts in leaf clusters of deciduous trees. Also utilize pine needles and artificial structures as roosts.

Species	Federal Listing Status/Proposed for Listing	State Status	Location and Time of Year in Project Area (VA, MD, DC)	Habitat Description
Birds				
Red-cockaded woodpecker (<i>Dryobates borealis</i>)	Threatened	Endangered (VA), endangered extirpated (MD)	Southeast VA all year.	Prefers to excavate cavities in mature longleaf pines, often older than 80 years and infected with red heart disease. These cavity trees form clusters, averaging 10 acres, with actively used trees exhibiting flowing sap as a defense. Territories range from 125 to 200 acres, influenced by habitat and population density.
Reptiles				
Bog turtle (<i>Glyptemys muhlenbergii</i>)	Threatened	Endangered (VA), threatened (MD), SGCN (DC)	Northern MD in the spring and summer.	Shallow, open-canopy wetlands with herbaceous vegetation, using both aquatic and terrestrial microhabitats. Hibernates in densely vegetated areas under roots, rock walls, or burrows.
Amphibians				
Eastern hellbender (<i>Cryptobranchus alleganiensis</i>)	Proposed endangered	Endangered (MD)	Western VA and MD all year.	Perennial streams and rivers where they spend much of their time lying motionless under large, flat rocks.
Fish				
Maryland darter (<i>Etheostoma sellare</i>)	Endangered	Endangered (MD)	Deer Creek, Harford County, MD all year. Critical habitat overlaps Deer Creek.	Thrives exclusively in fast-flowing riffles where upland streams transition to the coastal plain.

Species	Federal Listing Status/Proposed for Listing	State Status	Location and Time of Year in Project Area (VA, MD, DC)	Habitat Description
Clams				
Dwarf wedgemussel (<i>Alasmodonta heterodon</i>)	Endangered	Endangered (VA, MD), SGCN (DC)	Central VA, St. Mary's, Queen Anne's, and Caroline Counties, MD all year.	Sand, firm muddy sand, firm clay, or gravel bottoms in creeks and rivers of varying sizes with a slow to moderate current. To survive, they need a silt-free, stable streambed and well oxygenated water free of pollutants.
Atlantic pigtoe (<i>Fusconaia masoni</i>)	Threatened	Threatened (VA)	Throughout VA all year. Critical habitat is located in portions of Craig Creek off the James River, Nottoway River, Meherrin River, and the Roanoke River.	Coarse sand and gravel, and rarely in silt and detritus. Historically, the best populations existed in small creeks to larger rivers with excellent water quality, where flows were sufficient to maintain clean, silt-free substrates.
Yellow lance (<i>Elliptio lanceolata</i>)	Threatened	Threatened (VA, MD)	Throughout VA, MD, and DC all year. Critical habitat is designated in the Patuxent River, Rappahannock Subbasin, Rapidan Subbasin, South Anna River, Johns Creek, and the Nottoway Subbasin.	Occurs in streams and rivers, generally in clean, coarse to medium sands and sometimes in gravel substrates.

Species	Federal Listing Status/Proposed for Listing	State Status	Location and Time of Year in Project Area (VA, MD, DC)	Habitat Description
Green floater* (<i>Lasmigona subviridis</i>)	Proposed threatened	Threatened (VA), endangered (MD), SGCN (DC)	Throughout VA and MD all year.	Prefers streams with slow to medium flows and good water quality. Often found in sand or small gravel substrates. When they occur in larger streams and rivers, they are found in quieter pools and eddies, away from strong currents.
Cumberland moccasin shell (<i>Medionidus conradicus</i>)	Proposed endangered	SGCN (VA)	Southwest VA all year.	A natural body of running water.
Finerayed pigtoe (<i>Fusconaia cuneolus</i>)	Endangered	Endangered (VA)	Southwest VA all year.	Clean, fast-moving water with relatively stable cobble, gravel, and sand substrates free of siltation. Usually found buried in the substrate in shallow riffles, fords, and shoal areas but can also occur in deeper runs.
Fluted kidneyshell (<i>Ptychobranhus subtentus</i>)	Endangered	Endangered (VA)	Southwest VA all year.	A natural body of running water.
Shiny pigtoe (<i>Fusconaia cor</i>)	Endangered	Endangered (VA)	Southwest VA all year.	Clean, fast-moving water with relatively stable cobble, gravel, and sand substrates free of siltation. Usually found buried in the substrate in shallow riffles, fords, and shoal areas but can also occur in deeper runs.
Slabside pearlymussel (<i>Pleurionaia dolabelloides</i>)	Endangered	Endangered (VA)	Southwest VA all year.	A natural body of running water.

Species	Federal Listing Status/Proposed for Listing	State Status	Location and Time of Year in Project Area (VA, MD, DC)	Habitat Description
Tennessee clubshell (<i>Pleurobema oviforme</i>)	Proposed endangered	SGCN (VA)	Headwaters of the Tennessee river system in southwest VA all year.	A natural body of running water.
Snails				
Virginia fringed mountain snail (<i>Polygyriscus virginianus</i>)	Endangered	Endangered (VA)	New River, Pulaski County, VA all year.	Six miles of bluffs along New River.
Insects				
Rusty patched bumble bee (<i>Bombus affinis</i>)	Endangered	Endangered (VA, MD), SGCN (DC)	Western VA in the summer. Queens may overwinter in the project area. Critical habitat is located just north of Lake Moomaw in Hot Springs, VA.	Variety of habitats including prairies, woodlands, marshes agricultural landscapes, and residential parks and gardens. Nests are located in upland grasslands and shrublands.
Monarch butterfly* (<i>Danaus plexippus</i>)	Proposed threatened	SGCN (DC)	Throughout VA, MD, and DC in the spring, summer, and fall.	Fields, roadside areas, open areas, wet areas and urban gardens. Milkweed and flowering plants are required. Adult monarchs feed on the nectar of many flowers during breeding and migration, but they lay eggs on milkweed plants as that is the only food the caterpillars can eat.

Species	Federal Listing Status/Proposed for Listing	State Status	Location and Time of Year in Project Area (VA, MD, DC)	Habitat Description
Crustaceans				
Hay's spring amphipod (<i>Stygobromus hayi</i>)	Endangered	SGCN (DC)	Primarily in the Rock Creek area in DC all year.	Shallow, dark, organic-rich groundwater habitats called hypotelminorheic zones. These perched aquifers are underlain by clay and feed into seepage springs. Forest cover is crucial, providing food, water quality regulation, and moderating water temperature.
Flowering Plants				
Harperella (<i>Ptilimnium nodosum</i>)	Endangered	Endangered (VA, MD)	Stafford, Prince William, and Mecklenburg Counties, VA, Allegany County, MD all year.	Grows in wet soils near a body of water and can survive periodic, moderate flooding.
Northeastern bulrush (<i>Scirpus ancistrochaetus</i>)	Endangered	Endangered (VA, MD)	Throughout VA and MD all year.	Grows in wet areas – small wetlands, sinkhole ponds or wet depressions with seasonally fluctuating water levels. It may be found at the water's edge, in deep water or in just a few inches of water, and during dry spells there may be no water visible where the plant is growing.

Species	Federal Listing Status/Proposed for Listing	State Status	Location and Time of Year in Project Area (VA, MD, DC)	Habitat Description
Sensitive joint-vetch (<i>Aeschynomene virginica</i>)	Threatened	Threatened (VA, MD)	Throughout VA and MD all year.	Thrives in the intertidal zone of coastal marshes, particularly at the upper tidal limits with diverse vegetation. It favors sparsely vegetated, disturbed microhabitats for establishment and growth, acting as an early-successional species. This annual plant commonly colonizes areas with new soil deposits, roadside ditches, and muskrat disturbances.
Small whorled pogonia* (<i>Isotria medeoloides</i>)	Threatened	Endangered (VA), Endangered Extirpated (MD)	Throughout VA all year.	Grows in older hardwood stands of beech, birch, maple, oak, and hickory that have an open understory. Sometimes it grows in stands of softwoods such as hemlock. It prefers acidic soils with a thick layer of dead leaves, often on slopes near small streams.
Swamp pink (<i>Helonias bullata</i>)	Threatened	Endangered (VA, MD)	Throughout VA all year.	Requires an area that is perennially saturated but not flooded, with the water table at or near the surface. Found naturally in bogs, under shrubs, and in peaty soil.

* An asterisk indicates species that may occur and/or may be affected by the 2026 management activities.

References: USFWS, n.d.-b; MDDNR, n.d.; MDDNR, 2021; MDDNR, 2023; VADWR, 2025b; VADWR, 2025c; DOEE, 2015; USFWS, 2025

Determination Table

Table 4 summarizes the potential adverse effects to listed species as a result of the No-Action and the Proposed Action alternatives. An asterisk indicates species that may occur and/or that may be affected by the 2026 water chestnut management activities.

Table 4. Summary of effects to listed species from the No-Action and the Proposed Action Alternatives.

Species	Habitat Description	Effects from the No-Action Alternative	Effects from the Proposed Action
Northern long-eared bat* (<i>Myotis septentrionalis</i>)	Roosts under bark, in cavities, or crevices of trees and sometimes structures, utilizing both live and dead trees. Exhibit flexible roost selection based on tree suitability and rely on forested areas for roosting, foraging, and commuting.	No effect. The spread of water chestnut will not affect the northern long-eared bat or their habitats.	Using the <i>USFWS Northern Long-eared Bat and Tricolored Bat Range-wide Dkey</i> , USACE determined that the project may affect, but is not likely to adversely affect the northern long-eared bat and the tricolored bat.
Tricolored bat* (<i>Perimyotis subflavus</i>)	Primarily roost in leaf clusters of deciduous trees. Also utilize pine needles and artificial structures as roosts.	No effect. The spread of water chestnut will not affect the tricolored bat, or their habitats.	
Indiana bat (<i>Myotis sodalis</i>)	Roosts under peeling bark of sun-exposed, dead or dying trees in various forested habitats. Maternity roosts are often found in canopy gaps or along forest edges. Forages in semi-open to closed forests. Males utilize a broader range of roosting sites.	No effect. The spread of water chestnut will not affect the Indiana bat or their habitats.	The 2026 project locations do not overlap with the Indiana bat's habitat. USACE will assess effects should future water chestnut management activities extend into the Indiana bat's habitat.

Species	Habitat Description	Effects from the No-Action Alternative	Effects from the Proposed Action
Red-cockaded woodpecker (<i>Dryobates borealis</i>)	Prefer to excavate cavities in mature longleaf pines, often older than 80 years and infected with red heart disease. These cavity trees form clusters, averaging 10 acres, with actively used trees exhibiting flowing sap as a defense. Territories range from 125 to 200 acres, influenced by habitat and population density.	No effect. The spread of water chestnut will not affect the red-cockaded woodpecker or its habitat.	The risk of acute effects to birds from the proposed herbicides is expected to be low. Imazamox has been found to be essentially non-toxic to birds and mammals. Flumioxazin is practically non-toxic to birds based on short-term exposure. Fluridone has not been shown to cause any short- or long-term effects to birds, while 2,4-D is moderately to practically non-toxic, and triclopyr is practically non-toxic to birds. Therefore, the project may affect but is not likely to adversely affect the red-cockaded woodpecker. The 2026 project locations do not overlap with the species' habitat. USACE will assess effects should future water chestnut management activities extend into the red-cockaded woodpecker's habitat.

Species	Habitat Description	Effects from the No-Action Alternative	Effects from the Proposed Action
Bog turtle <i>(Glyptemys muhlenbergii)</i> Eastern hellbender <i>(Cryptobranchus alleganiensis)</i>	Shallow, open-canopy wetlands with herbaceous vegetation, using both aquatic and terrestrial microhabitats. Hibernates in densely vegetated areas under roots, rock walls, or burrows. Perennial streams and rivers where they spend much of their time lying motionless under large, flat rocks.	The unmanaged spread of water chestnut could adversely affect these species by severely limiting light and reducing oxygen levels, as detailed in Section 5.3.6.1.	Effects to amphibians and reptiles are expected to be insignificant for all proposed herbicides discussed as taxa-specific toxicity data is not available. Based on this information, USACE has determined that the project may affect but is not likely to adversely affect the bog turtle and the eastern hellbender. The 2026 project locations do not overlap with these species' habitat. USACE will assess effects should future water chestnut management activities extend into the bog turtle or the eastern hellbender's habitats.

Species	Habitat Description	Effects from the No-Action Alternative	Effects from the Proposed Action
Maryland darter <i>(Etheostoma sellare)</i>	Thrives exclusively in fast-flowing riffles where upland streams transition to the coastal plain.	Invasive aquatic plants can be beneficial to fish in the same way that natives are by providing surfaces for algae and small animals to live and by providing structure for cover and shelter (UF/IFAS, n.d.). However, invasive aquatic plants like water chestnut will often exceed densities of native aquatic vegetation while expanding into areas that do not contain natives at all. This can concentrate fish and wildlife into small areas of open water which exposes them to predators and limits their use of available habitat (UF/IFAS, n.d.).	Manual removal of water chestnut has minimal adverse effects on fish. However, mechanical harvesting can harm fish that use water chestnut for shelter, food, or breeding, and removing dense mats of the plant can make smaller fish more vulnerable to predators. These effects will be temporary, and in the long run, water chestnut management will help fish populations by restoring native vegetation and preventing the negative effects of overgrowth. Herbicides considered in the proposed action are not expected to have significant, lasting adverse effects on fish, having passed comprehensive USEPA risk assessments for aquatic use. The 2026 project locations do not overlap with the species' habitat. USACE will assess effects should future water chestnut management activities extend into the darter's habitat.

Species	Habitat Description	Effects from the No-Action Alternative	Effects from the Proposed Action
Dwarf wedgemussel <i>(Alasmodonta heterodon)</i> Atlantic pigtoe <i>(Fusconaia masoni)</i> Yellow lance <i>(Elliptio lanceolata)</i> Green floater* <i>(Lasmigona subviridis)</i> Cumberland moccasin shell <i>(Medionidus conradicus)</i> Finerayed pigtoe <i>(Fusconaia cuneolus)</i> Fluted kidneyshell <i>(Ptychobranhus subtentus)</i> Shiny pigtoe <i>(Fusconaia cor)</i> Slabside pearlymussel <i>(Pleurionaiia dolabelloides)</i> Tennessee clubshell <i>(Pleurobema oviforme)</i> Virginia fringed mountain snail <i>(Polygyriscus virginianus)</i>	Typically found on coarse to medium sands and sometimes in gravel substrates. Requires well oxygenated water free of pollutants. When they occur in larger streams and rivers, they are found in quieter pools and eddies, away from strong currents.	In areas where these clams and water chestnut coexist, the unmanaged spread of water chestnut could adversely affect the clams by severely limiting light and reducing oxygen levels, as detailed in Section 5.3.6.1.	Using the <i>USFWS Northeast Dkey</i>, USACE determined that there will be no effect to the green floater clam. Utilizing the green floater clam Dkey results and considering the similar habitat requirements of other clam species, USACE has determined that the proposed action will have no effect on these other clam species.

Species	Habitat Description	Effects from the No-Action Alternative	Effects from the Proposed Action
Rusty patched bumble bee (<i>Bombus affinis</i>)	Variety of habitats including prairies, woodlands, marshes agricultural landscapes, and residential parks and gardens. Nests are located in upland grasslands and shrublands.	No effect. The spread of water chestnut will not affect the rusty patched bumble bee or its habitat.	Based on the <i>USFWS Rusty Patched Bumble Bee Rangewide Dkey</i>, USACE determined that the project may affect, but is not likely to adversely affect the rusty patched bumble bee. The 2026 project locations do not overlap with the species' habitat. USACE will assess effects should future water chestnut management activities extend into the bee's habitat.

Species	Habitat Description	Effects from the No-Action Alternative	Effects from the Proposed Action
Monarch butterfly* (<i>Danaus plexippus</i>)	Fields, roadside areas, open areas, wet areas and urban gardens. Milkweed and flowering plants are required. Adult monarchs feed on the nectar of many flowers during breeding and migration, but they lay eggs on milkweed plants as that is the only food the caterpillars can eat.	No effect. The spread of water chestnut will not affect the monarch butterfly or its habitat.	Monarch butterflies are expected to be present in the project area from May through September. The peak period to see monarchs in project area is when they migrate through the region in large numbers from mid to late September. The monarch has a specific host plant, milkweed, which provides the butterfly's larvae and caterpillars with food. Although not documented at the site, several species of milkweed could occur in the project area. While milkweed is likely present in the project area, the herbicides will only be applied to the aquatic water chestnut and will not be applied to terrestrial plants. Proper application methods to reduce chemical drift will be employed to mitigate the risk of adverse effects to non-target species. Therefore, USACE has determined that the proposed action will have no effect on the monarch butterfly.

Species	Habitat Description	Effects from the No-Action Alternative	Effects from the Proposed Action
Hay's spring amphipod <i>(Stygobromus hayi)</i>	Shallow, dark, organic-rich groundwater habitats called hypotelminorheic zones. These perched aquifers are underlain by clay and feed into seepage springs. Forest cover is crucial, providing food, water quality regulation, and moderating water temperature.	In areas where these species and water chestnut coexist, the unmanaged spread of water chestnut could adversely affect the clams and snails by severely limiting light and reducing oxygen levels, as detailed in Section 5.3.6.1.	The herbicides considered for use may have varying degrees of acute risks to invertebrates. USEPA has determined that imazamox is virtually non-toxic to aquatic invertebrates. Flumioxazin undergoes rapid degradation in water, light, and under microbial influence. However, direct exposure has been identified as moderately toxic to benthic species. Fluoridone is considered moderately toxic while the triethylamine salt variant of triclopyr is considered practically non-toxic to benthic species. Based on this information, USACE has determined that the project may affect but is not likely to adversely affect the Hay's spring amphipod and the Virginia mountain snail. The 2026 project locations do not overlap with the species' habitat. USACE will assess effects should future water chestnut management activities extend into these species' habitats.

Species	Habitat Description	Effects from the No-Action Alternative	Effects from the Proposed Action
Northeastern Bulrush (<i>Scirpus ancistrochaetus</i>)	Grows in wet areas – small wetlands, sinkhole ponds or wet depressions with seasonally fluctuating water levels. It may be found at the water's edge, in deep water or in just a few inches of water, and during dry spells there may be no water visible where the plant is growing.	Without the preferred alternative, water chestnut will continue to spread throughout the water bodies where the species is present, outcompeting native aquatic vegetation such as American waterweed (<i>Elodea canadensis</i>) and pondweeds (<i>Potamogeton</i> spp.), which provide suitable food and habitat to native fish and wildlife species and their prey. Under the no-action alternative, the ecosystems of these water bodies would be severely negatively impacted.	It is unlikely that northeastern bulrush would be found in the same waterbodies as water chestnut, as they thrive in different environments. Northeastern bulrush prefers shallow, wet areas, while water chestnut grows in deeper water. Therefore, the proposed action will have no effect on the northern bulrush.
Small whorled pogonia* (<i>Isotria medeoloides</i>)	Grows in older hardwood stands of beech, birch, maple, oak, and hickory that have an open understory. Sometimes it grows in stands of softwoods such as hemlock. It prefers acidic soils with a thick layer of dead leaves, often on slopes near small streams.		Using the <i>USFWS Northeast Dkey</i> , USACE determined that there will be no effect to the small whorled pogonia.

Species	Habitat Description	Effects from the No-Action Alternative	Effects from the Proposed Action
Harperella (<i>Ptilimnium nodosum</i>)	Grows in wet soils near a body of water and can survive periodic, moderate flooding.		The 2026 project locations do not overlap with the harperella or swamp pink habitats. Should future water chestnut management activities extend into these species' habitats, USACE will assess effects should future water chestnut management activities extend into these species' habitats.
Swamp pink (<i>Helonias bullata</i>)	Requires an area that is perennially saturated but not flooded, with the water table at or near the surface. Found naturally in bogs, under shrubs, and in peaty soil.		

Coordination with State Conservation Agencies

Coordination with state conservation agencies including the Virginia Department of Wildlife Resources, the Maryland Department of Natural Resources, and the DC Department of Energy and Environment will occur during the 30-day public comment period. Recommendations from these agencies will be considered in the final NEPA document.

IPaC resource list

This report is primarily generated from the list of species and their resources which are biologically (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction. It is expected that the project will be referred to the relevant state or local agency for the project, but the project will be directly affected by the project. However, determining the likelihood of effects on the project may have various resource-specific requirements (e.g., vegetation/species surveys) and project-specific (e.g., management) and mitigation for project activities) if required.

Below is a summary of the project if mainly provided to the USFWS office(s) with jurisdiction in the defined project area. Please read the relevant section of the following (Endangered Species, Migratory Birds, USFWS Field Offices, USFWS Wildlife) for details of the project applicable to the resources addressed in this section.

Location

Delaware, District of Columbia, Maryland, North Carolina, Virginia, and West Virginia



Local offices

Chesapeake Bay Ecological Services Field Office

☎ (410) 573-4599

📠 (410) 266-9127

177 Admiral Cochrane Drive
Annapolis, MD 21401-7307

Virginia Ecological Services Field Office

☎ (804) 693-6694

6669 Short Lane
Gloucester, VA 23061-4410

West Virginia Ecological Services Field Office

☎ (304) 866-3818

📠 (304) 866-3852

6263 Appalachian Highway
Davis, WV 26260-8061

Raleigh Ecological Services Field Office

☎ (919) 856-4520

📠 (919) 856-4556

3916 Sase Ridge Rd
Raleigh, NC 27607

Endangered species

This resource is in the public domain and does not contain any analysis or projections.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be directly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, additional site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species¹ and their critical habitats are managed by the [Ecological Services Program](#) of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries²).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact [NOAA Fisheries](#) for [species under their jurisdiction](#).

1. Species listed under the [Endangered Species Act](#) are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the [listing status page](#) for more information. IPaC only shows species that are regulated by USFWS (see FAQ).
2. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS
Carolina Northern Flying Squirrel <i>Glaucomys sabrinus coloratus</i> Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/2657	Endangered
Gray Bat <i>Myotis grisescens</i> Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/6329	Endangered
Indiana Bat <i>Myotis sodalis</i> Wherever found There is final critical habitat for this species. Your location overlaps the critical habitat. https://ecos.fws.gov/ecp/species/5949	Endangered
Northern Long-eared Bat <i>Myotis septentrionalis</i> Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	Endangered
Tricolored Bat <i>Perimyotis subflavus</i> Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

Virginia Big ear Bat *Myotis virginianus* (=Placois) **Endangered**

Wherever found

There is **final** critical habitat for this species. Your location overlaps the critical habitat. <https://ecos.fws.gov/ecp/species/8369>

West Indian Manatee *Trichechus manatus* **Threatened**

Wherever found

There is **final** critical habitat for this species. Your location does not overlap the critical habitat. <https://ecos.fws.gov/ecp/species/4469>

Threatened

Marine mammal **Endangered**

Birds

NAME

STATUS

Bermuda Petrel *Proteroma caerulea* **Endangered**

Wherever found

No critical habitat has been designated for this species. <https://ecos.fws.gov/ecp/species/3507>

Eastern Black Rail *Laterallus jamaicensis ssp. jamaicensis* **Threatened**

Wherever found

No critical habitat has been designated for this species. <https://ecos.fws.gov/ecp/species/10477>

Piping Plover *Charadrius melodus* **Threatened**

There is **final** critical habitat for this species. Your location does not overlap the critical habitat. <https://ecos.fws.gov/ecp/species/6039>

Red-cockaded Woodpecker *Dryobates borealis* **Threatened**

Wherever found

No critical habitat has been designated for this species. <https://ecos.fws.gov/ecp/species/7614>

Roseate Tern *Sterna dougallii dougallii* **Endangered**

No critical habitat has been designated for this species. <https://ecos.fws.gov/ecp/species/2083>

Rufa Red Knot *Calidris canutus rufa* **Threatened**

Wherever found

There is **proposed** critical habitat for this species. Your location overlaps the critical habitat. <https://ecos.fws.gov/ecp/species/1864>

Reptiles

NAME

STATUS

American Alligator *Alligator mississippiensis* **SAT**

Wherever found

No critical habitat has been designated for this species. <http://ecos.fws.gov/ecp/species/776>

Bog Turtle *Glyptemys muhlenbergii* **Threatened**

No critical habitat has been designated for this species. <https://ecos.fws.gov/ecp/species/6962>

Green Sea Turtle *Chelonia mydas* **Threatened**

There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat. <https://ecos.fws.gov/ecp/species/6199>

Hawksbill Sea Turtle *Eretmochelys imbricata* **Endangered**

Wherever found

There is **final** critical habitat for this species. Your location does not overlap the critical habitat. <https://ecos.fws.gov/ecp/species/3656>

Kemp's River Sea Turtle Lepidochelys kempe

Endangered

Wherever found

There is **proposed** critical habitat for this species.

<https://ecos.fws.gov/ecp/species/5523>

Leatherback Sea Turtle Dermochelys coriacea

Endangered

Wherever found

There is **final** critical habitat for this species. Your location does not overlap the critical habitat.

<https://ecos.fws.gov/ecp/species/1493>

Loggerhead Sea Turtle Caretta caretta

Threatened

There is **final** critical habitat for this species. Your location does not overlap the critical habitat.

<https://ecos.fws.gov/ecp/species/1110>

Amphibians

NAME

STATUS

Eastern Hellbender Cryptobranchus alleganiensis alleganiensis

Proposed Endangered

Wherever found

No critical habitat has been designated for this species.

<https://ecos.fws.gov/ecp/species/9039>

Shenandoah Salamander Plethodon shenandoah

Endangered

Wherever found

No critical habitat has been designated for this species.

<https://ecos.fws.gov/ecp/species/4097>

Fishes

NAME

STATUS

Candy Darter Etheostoma osburni

Endangered

Wherever found

There is **final** critical habitat for this species. Your location overlaps the critical habitat.

<https://ecos.fws.gov/ecp/species/1396>

Maryland Darter Etheostoma sellare

Endangered

Wherever found

There is **final** critical habitat for this species. Your location overlaps the critical habitat.

<https://ecos.fws.gov/ecp/species/5135>

Sickle Darter Percina williamsi

Threatened

Wherever found

There is **proposed** critical habitat for this species. Your location overlaps the critical habitat.

<https://ecos.fws.gov/ecp/species/9866>

Yellowfin Madtom Noturus flavipinnis

EXPN

No critical habitat has been designated for this species.

<http://ecos.fws.gov/ecp/species/8565>

Yellowfin Madtom Noturus flavipinnis

Threatened

There is **final** critical habitat for this species. Your location does not overlap the critical habitat.

<https://ecos.fws.gov/ecp/species/8565>

Clams

NAME

STATUS

Atlantic Pigtoe Fusconaia masoni

Threatened

Wherever found

There is **final** critical habitat for this species. Your location overlaps the critical habitat.

<https://ecos.fws.gov/ecp/species/5164>

Cumberland Moccasinshell Melanostoma muscivora

Proposed Endangered

Wherever found

No critical habitat has been designated for this species.

<https://ecos.fws.gov/ecp/species/9881>

Dwarf Wee e el Ala onta hetero on /

En an ere

Wherever fo n

No critical habitat ha been e i nate for thi pecie . /

<https://ecos.fws.gov/ecp/species/784>

Fineraye Pi toe F conaia c neol

En an ere /

No critical habitat ha been e i nate for thi pecie . /

<https://ecos.fws.gov/ecp/species/3038>

Fl te Ki ney hell Ptychobbranch btent

En an ere

Wherever fo n

There i **final** critical habitat for thi pecie . Yo r location overlap the critical habitat. /

<https://ecos.fws.gov/ecp/species/1397/>

Green Floater La onia bviri i

Propo e Threatene

Wherever fo n

There is **proposed** critical habitat for this species. Your location overlaps the critical habitat. /

<https://ecos.fws.gov/ecp/species/7541>

James Spiny mussel Parvaspina collina

Endangered

Wherever found

No critical habitat has been designated for this species.

<https://ecos.fws.gov/ecp/species/2212>

Shiny Pigtoe Fusconaia cor

Endangered

No critical habitat has been designated for this species. /

<https://ecos.fws.gov/ecp/species/2573>

Slabside Pearly mussel Pleuronaia dolabelloides

Endangered

Wherever found

There is **final** critical habitat for this species. Your location overlaps the critical habitat.

<https://ecos.fws.gov/ecp/species/1518>

Tennessee Clubshell Pleurobema oviforme e

Proposed Endangered

Wherever found

No critical habitat has been designated for this species.

<https://ecos.fws.gov/ecp/species/3254>

Tennessee Pigtoe Pleuronaia barnesiana /

Proposed Endangered

Wherever found

No critical habitat has been designated for this species.

<https://ecos.fws.gov/ecp/species/9887>

Yellow Lance Elliptio lanceolata /

Threatened

Wherever found

There is **final** critical habitat for this species. Your location overlaps the critical habitat.

<https://ecos.fws.gov/ecp/species/4511>

Snails

NAME

STATUS

Vir inia Frin e Mo ntain Snail Poly yri c vir inian /

En an ere

Wherever fo n

No critical habitat ha been e i nate for thi pecie .

<https://ecos.fws.gov/ecp/species/6905>

Insects

NAME

STATUS

Mitchell' Satyr B tterfly Neony hap tchellii tchellii /

En an ere /

Wherever fo n

No critical habitat ha been e i nate for thi pecie .

<https://ecos.fws.gov/ecp/species/8062>

Monarch r ly Dana s pl xipp s .

Propos d Thr a n d

Wh r v r o n d

Th r is **proposed** cri cal habi a or his sp ci s Yo r loca ion do s no ov rlap h cri cal habi a

<https://ecos.fws.gov/ecp/species/9743>

Nor h as rn ach Tig r l Habrosc limorpha dorsalis dorsalis .

Thr a n d

Wh r v r o n d

No cri cal habi a has b n d signa d or his sp ci s

<https://ecos.fws.gov/ecp/species/8105>

P ri an Tig r l Ellipsop ra p ri ana .

Thr a n d

Wh r v r o n d

No cri cal habi a has b n d signa d or his sp ci s .

<https://ecos.fws.gov/ecp/species/6073>

Rusy Patched bumble bee Bombus auratus

Endangered

Wherever found

There is **proposed** critical habitat for this species. Your location overlaps the critical habitat.

<https://ecos.fws.gov/ecp/species/9383>

Arachnids

NAME .

STATUS

Spruce-fir Moss Spider Microhexura montivaga

Endangered

Wherever found

There is **final** critical habitat for this species. Your location does not overlap the critical habitat.

<https://ecos.fws.gov/ecp/species/4801>

Crustaceans

NAME .

STATUS

Hay's Spring Amphipod Stygobromus hayi .

Endangered

Wherever found

No critical habitat has been designated for this species.

<https://ecos.fws.gov/ecp/species/8410>

Madison Cave Isopod Antrolana lira .

Threatened

Wherever found

No critical habitat has been designated for this species.

<https://ecos.fws.gov/ecp/species/4162>

Flowering Plants

NAME .

STATUS

Canby's Dropwort Oxypolis canbyi .

Endangered

Wh r v r o n d

No cri cal habi a has b n d signa d or his sp ci s

<https://ecos.fws.gov/ecp/species/7738>

Eas rn Prairi Fring d Orchid Platan h ra l copha a .

Thr a n d

Wh r v r o n d

No cri cal habi a has b n d signa d or his sp ci s

<https://ecos.fws.gov/ecp/species/601>

Harp r lla P ilimni m nodos m .

Endang r d

Wh r v r o n d

No cri cal habi a has b n d signa d or his sp ci s

<https://ecos.fws.gov/ecp/species/3739>

Micha x's S mac Rh s micha xii .

Endang r d

Wh r v r o n d

No cri cal habi a has b n d signa d or his sp ci s .

<https://ecos.fws.gov/ecp/species/5217>

Northeastern Shagbark Hickory <i>Castrochaetops</i> No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/6715	Endangered
Peter's Mountain Mania corei Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/860	Endangered
Roadside Hedyotis persea var. montana Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/1087	Endangered
Sandwich Island Gerardia Agaisac Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/8128	Endangered
Seabeach Amaranth <i>Amaranthus pumilus</i> Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/8549	Threatened
Sensitive Joint-vetch <i>Aeschynomene virginica</i> Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/855	Threatened
Shale Barren Rock Cress <i>Boechera serotina</i> Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/6018	Endangered
Small Whorled Pogonia <i>Isotria medeoloides</i> No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/1890	Threatened
Small-anthered Bittercress <i>Cardamine micranthera</i> Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/3462	Endangered
Smooth Coneflower <i>Echinacea laevigata</i> Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/3473	Threatened
Swamp Pink Helianthus No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/4333	Threatened
Virginia Roadside Birch <i>Betula</i> Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/2736	Threatened
Virginia Sessileweed <i>Hedeoma virginicum</i> Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/6297	Threatened
Virginia Spiraea <i>Spiraea virginica</i> Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/1728	Threatened

Lichens

NA	E M	STATUS
Rock Gnome Lichen	Gymnoma lineae	Endangered
Where found	No critical habitat has been designated for this species. M	
	https://ecos.fws.gov/ecp/species/3933	

Critical habitats

Potential effects to critical habitat() in this location must be analyzed along with the endangered species themselves.

This location overlaps the critical habitat of the following species:

NA	E M	TYPE
Atlantic Pigtoe	FuM onia ma oni	Final M
	https://ecos.fws.gov/ecp/species/5164#crithab	
Candy Darter	Etheostoma osburni	Final
	https://ecos.fws.gov/ecp/species/1396#crithab	
Fluted Kidneyshell	Ptychobranhus subtentus	Final
	https://ecos.fws.gov/ecp/species/1397#crithab	
Green Floater	Lasmigona subviridis	Proposed
	https://ecos.fws.gov/ecp/species/7541#crithab	
Indiana Bat	Myotis sodalis	Final
	https://ecos.fws.gov/ecp/species/5949#crithab	
Maryland Darter	Etheostoma sellare	Final
	https://ecos.fws.gov/ecp/species/5135#crithab	
Rufa Red Knot	Calidris canutus rufa	Proposed
	https://ecos.fws.gov/ecp/species/1864#crithab	
Rusty Patched Bumble Bee	Bombus affinis	Proposed
	https://ecos.fws.gov/ecp/species/9383#crithab	
Sickle Darter	Percina williamsi	Proposed
	https://ecos.fws.gov/ecp/species/9866#crithab	
Slabside Pearlymussel	Pleuroanaia dolabellodes	Final
	https://ecos.fws.gov/ecp/species/1518#crithab	
Village Wren	Coereba bartholemica	Final
	https://ecos.fws.gov/ecp/species/8334#crithab	
Yellow Lantern	Elliptio lan eolata	Final M
	https://ecos.fws.gov/ecp/species/4511#crithab	

Bald & Golden Eagles

Bald and Golden Eagle are protected under the Bald and Golden Eagle Protection Act² and the Migratory Bird Treaty Act (MBA)¹. Any person or organization who plans to conduct activities that may result in impact to Bald or Golden Eagle, or their nests, should follow appropriate regulation and implement required avoidance and minimization measures, as described in the various link on this page.

The data in this location indicate that no eagle have been observed in this area. This does not mean eagle are not present in your project area, especially in the area identified to survey. Please review the 'Steps to Take When No Results Are Returned' section of the [Supplemental Information on Migratory Birds and Eagles document](#) to determine if your project is in a poorly surveyed area. If it is, you

ma eed t rel ther re urce t determi e if e gle ma be pre e t (e.g. ur l c l FWS field ffice, t te ur e , ur w urvey).

Additio al i formatio ca be fou d usi g the followi g li ks:

- Eagle Ma ageme t <https://www.fws.gov/program/eagle-management>
- Measures for avoidi g a d mi imizi g impacts to birds <https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds>
- Natio wide avoida ce a d mi imizatio measures for birds <https://www.fws.gov/sites/default/files/documents/nationwide-standard-n-conservation-measures.pdf>
- Suppleme tal I formatio for Migratory Birds a d Eagles i IPaC <https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action> n

Bald and Golden Eagle information is not available at this time

Bald & Golden Eagles FAQs

What does IPaC use to generate the potential presence of bald and golden eagles in my specified location?

The potential for eagle presence is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are an eagle ([Bald and Golden Eagle Protection Act](#) requirements may apply).

Proper interpretation and use of your eagle report

On the graphs provided, please look carefully at the survey effort (indicated by the black vertical line) and for the existence of the "no data" indicator (a red horizontal line). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort line or no data line (red horizontal) means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list and associated information help you know what to look for to confirm presence and helps guide you in knowing when to implement avoidance and minimization measures to eliminate or reduce potential impacts from your project activities or get the appropriate permits should presence be confirmed.

How do I know if eagles are breeding, wintering, or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating, or resident), you may query your location using the [RAIL Tool](#) and view the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If an eagle on your IPaC migratory bird species list has a breeding season associated with it (indicated by yellow vertical bars on the phenology graph in your "IPaC PROBABILITY OF PRESENCE SUMMARY" at the top of your results list), there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

Interpreting the Probability of Presence Graphs

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. A taller bar indicates a higher probability of species presence. The survey effort can be used to establish a level of confidence in the presence score.

How is the probability of presence score calculated? The calculation is done in three steps:

The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.

T r p r p e n l p r e e t h e p a t t e r n f r o m p r e s e n c e o r n t h e r e n t r e l a t i v e p r o b a b i l i t y f r o m p r e s e n c e i s c a l c u l a t e d . T h i s t h e n p r o b a b i l i t y f r o m p r e s e n c e i s d i v i d e d b y t h e m a x i m u m p r o b a b i l i t y f r o m p r e s e n c e o n t h e w e e k . F o r e x a m p l e , i m a g i n e t h e p r o b a b i l i t y f r o m p r e s e n c e i n w e e k 20 f o r t h e S p o t t e d T o w h e e i s 0.0 n o r d n t h t h e p r o b a b i l i t y f r o m p r e s e n c e i n w e e k 12 (0.2 n) i s t h e m a x i m u m f o r t h e w e e k f o r t h e y e a r . T h e r e f o r e t h e p r o b a b i l i t y f r o m p r e s e n c e i n w e e k 12 i s 0.2 n o r d n t ; n t w e e k 20 i s 0.0 n o r d n 0.2 .

The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

Breeding Season ()

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort ()

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data () n

A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse. n

Migratory birds

The Migratory Bird Treaty Act (MBTA) ¹ prohibits the take (including killing, capturing, selling, trading, and transport) of protected migratory bird species without prior [authorization](#) by the Department of Interior U.S. Fish and Wildlife Service (FWS).

1. The [Migratory Birds Treaty Act](#) of 1918.
2. The [Bald and Golden Eagle Protection Act](#) of 1940.

Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/_agls-manag_mnt
- Measures for avoiding and minimizing impacts to birds <https://www.fws.gov/library/collections/avoiding-and-minimizing-incidentals-take-migratory-birds>
- Nationwide avoidance and minimization measures for birds
- Supplemental Information for Migratory Birds and Eagles in IPaC <https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action>

Migratory bird information is not available at this time

Migratory Bird FAQs

Tell me more about avoidance and minimization measures I can implement to avoid or minimize impacts to migratory birds.

[Nationwide Avoidance & Minimization Measures for Birds](#) describes measures that can help avoid and minimize impacts to all birds at any location year-round. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is one of the most effective ways to minimize impacts. To see when birds are most likely to occur and breed in your project area, view the Probability of Presence Summary. [Additional measures](#) or [permits](#) may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?

The Migratory Bird Resource List is comprised of [Birds of Conservation Concern \(BCC\)](#) and other species that may warrant special attention in your project location, such as those listed under the Endangered Species Act or the [Bald and Golden Eagle Protection Act](#) and those species marked as "Vulnerable". See the FAQ "What are the levels of concern for migratory birds?" for more information on the levels of concern covered in the IPaC migratory bird species list.

The migratory bird list generated for your project is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) with which your project intersects. These species have been identified as warranting special attention because they are BCC species in that area, an eagle ([Bald and Golden Eagle Protection Act](#) requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, and to verify survey effort when no results present, please visit the [Rapid Avian Information Locator \(RAIL\) Tool](#).

Why are subspecies showing up on my list?

Subspecies profiles are included on the list of species present in your project area because observations in the AKN for the species are being detected. If the species are present, that means that the subspecies may also be present. If a subspecies shows up on your list, you may need to rely on other resources to determine if that subspecies may be present (e.g. your local FWS field office, state surveys, your own surveys).

What does IPaC use to generate the probability of presence graphs for migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the [Avian Knowledge Network \(AKN\)](#). This data is derived from a growing collection of [survey, banding, and citizen science datasets](#).

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go to the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird breeds, winters, or migrates in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating, or resident), you may query your location using the [RAIL Tool](#) and view the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your IPaC migratory bird species list has a breeding season associated with it (indicated by yellow vertical bars on the phenology graph in your "IPaC e PROBABILITY OF PRESENCE SUMMARY" at the top of your results list), there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Ra d " brds ar [Birds of Conserva ion Concern](#) BCC) ha ar of co c r hro ho h rra a y h r h h USA cl d Ha a , h Pacfc Isla ds, P ro R co, a d h Vr Isla ds);
2. "BCC - BCR" brds ar BCCs that ar of co c r o ly part ular Brd Co s rvato R o s BCRs) th co t tal USA; a d
3. "No -BCC - Vul rabl " brds ar ot BCC sp c s your proj ct ar a, but app aro your l st th r b caus of th [Bald and Golden Eagle Protection \(Act](#) r qur me ts for a l s) or for o - a l s) pot tal susc pt bl t s offshor ar as from c rta typ s of d v lopme to act v t s . . offshor r y d v lopme to lo l fsh).

Althou h t s mporta t to avo d a d mi miz mpacts to all brds, fforts should b mad , part ular, to avo d a d mi miz mpacts to th brds o th s l st, sp cally BCC sp c s. For mor format o o avo d a c a d mi mizato measur s you ca mpl me t to h lp avo d a d mi miz mi ratory brd mpacts, pl as s th FAQ "T ll memor about avo d a c a d mi mizato measur s lca mpl me t to avo d or mi miz mpacts to mi ratory brds".

Details about birds that are potentially affected by offshore projects

For add to al d tals about th r lat v occurr c a d abu d c of both d v dual brd sp c s a d roups of brd sp c s th your proj ct ar a off th Atla tc Coast, pl as v st th [Northeast Ocean Data Portal](#). Th Portal also off rs data a d format o about oth r taxa b s d brds that may b h lpful to you your proj ct r v . Alt r at ly, you may do load th brd mod l r sults fl s u d r ly th portal maps throu h th [NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf](#) proj ct bpa .

Proper interpretation and use of your(migratory bird report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please look carefully at the survey effort (indicated by the black vertical line) and for the existence of the "no data" indicator (a red horizontal line). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list does not represent all birds present in your project area. It is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list and associated information help you know what to look for to confirm presence and helps guide implementation of avoidance and minimization measures to eliminate or reduce potential impacts from your project activities, should presence be confirmed. To learn more about avoidance and minimization measures, visit the FAQ "Tell me about avoidance and minimization measures I can implement to avoid or minimize impacts to migratory birds".

Interpreting the Probability of Presence Graphs

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. A taller bar indicates a higher probability of species presence. The survey effort can be used to establish a level of confidence in the presence score.

How is the probability of presence score calculated? The calculation is done in three steps:

The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.

To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is $0.25/0.25 = 1$; at week 20 it is $0.05/0.25 = 0.2$.

The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

Breeding Season ()

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort ()

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data ()

A k s mark d as hav o data f th r r o surv y v ts for that k.

Survey Timeframe

Surv ys from o ly th last 10 y ars ar us d ord r to sur d l v ry of curr tly r l va t format o . Th xc pt o to th s ar as off th Atla tc coast, (h r brd r tur s ar bas d o all y ars of ava bl data, s c data th s ar as s curr tly much mor spars .

Marine mammals

Marine mammals are protected under the [Marine Mammal Protection Act](#). They are also protected under the Endangered Species Act¹ and the Convention on International Trade in Endangered Species of Wild Fauna and Flora².

The responsibilities for the recovery, conservation, and management of marine mammals are shared by the U.S. Fish and Wildlife Service [reimbursed, war, marine, and management] and NOAA Fisheries³ [reimbursed, marine, and recovery]. Marine mammals under the responsibility of NOAA Fisheries are **not** shown in this information on the species available in the [Marine Mammals](#) page of the NOAA Fisheries website.

The Marine Mammal Protection Act prohibits the take of marine mammals and further coordination may be necessary for project evaluation. Please contact the U.S. Fish and Wildlife Service Field Office shown.

1. The [Endangered Species Act](#) (ESA) of 1973.
2. The [Convention on International Trade in Endangered Species of Wild Fauna and Flora](#) (CITES) is a treaty to ensure that international trade in plants and animals does not threaten their survival in the wild.
3. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following marine mammals under the responsibility of the U.S. Fish and Wildlife Service are potentially affected by activities in this location:

NAME

West Indian Manatee *Trichechus manatus*
<https://ecos.fws.gov/ecp/species/4469>

Coastal Barrier Resources System

Projects within the [John H. Chafee Coastal Barrier Resources System](#) (CBRS) may be subject to the restrictions on Federal expenditures and financial assistance and the consultation requirements of the Coastal Barrier Resources Act (CBRA) (16 U.S.C. 3501 et seq.). For more information, please contact the local [Ecological Services Field Office](#) or visit the [CBRA Consultations website](#). The CBRA website provides tools such as a flow chart to help determine whether consultation is required and a template to facilitate the consultation process.

This location overlaps the following CBRS unit(s):

System Unit (SU)

Most new Federal expenditures and financial assistance, including Federal flood insurance, are prohibited within System Units. Federally-funded projects within System Units require consultation with the Service. Consultation is not required for projects using private, state, or local funds.

[K05 - U 10/15/1990 - FI 10/15/1990](#) S
[K05 - U 11/16/1990 - FI 11/16/1990](#)
[K05 - U 11/25/2024 - FI 11/16/1991](#)
[MD-11 - U 11/16/1990 - FI 11/16/1990](#)
[MD-12 - U 11/16/1990 - FI 11/16/1990](#)
[MD-12 - U 11/25/2024 - FI 11/25/2025](#)
[MD-14 - U 11/16/1990 - FI 11/16/1990](#)
[MD-14 - U 11/25/2024 - FI 11/25/2025](#) S
[MD-15 - U 11/16/1990 - FI 11/16/1990](#)
[MD-15 - U 11/25/2024 - FI 11/25/2025](#) S
[MD-16 - U 11/16/1990 - FI 11/16/1990](#)
[MD-16 - U 11/25/2024 - FI 11/25/2025](#)
[MD-19 - U 11/16/1990 - FI 11/16/1990](#) S
[MD-20 - U 11/16/1990 - FI 11/16/1990](#) S
[MD-20 - U 11/25/2024 - FI 11/25/2025](#)
[MD-22 - U 11/16/1990 - FI 11/16/1990](#)
[MD-24 - U 11/16/1990 - FI 11/16/1990](#)
[MD-26 - U 11/16/1990 - FI 11/16/1990](#)
[MD-26 - U 11/25/2024 - FI 11/25/2025](#) S
[MD-27 - U 11/16/1990 - FI 11/16/1990](#) S

[MD-27 - S 0 4 - FI 0](#)
[MD-28 - S 6 990 - FI 6 990](#)
[MD-28 - S 0 4 - FI 0](#)
[MD-29 - S 6 990 - FI 6 990](#)
[MD-30 - S 6 990 - FI 6 990](#)
[MD-30 - S 0 4 - FI 0](#)
[MD-32 - S 6 990 - FI 6 990](#)
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OPA is denoted with a "P" at the end of the unit number. The only prohibition within OPA is on Federal flood insurance. **CBRA consultation is not required for projects within OPAs** because agencies providing disaster assistance that is contingent upon a requirement to purchase flood insurance after the fact are advised to disclose the OPA designation and information on the restrictions on Federal flood insurance to the recipient prior to the commitments of funds. c

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Data limitations

The CBRS boundaries used in IPaC are representations of the controlling boundaries, which are depicted on the [official CBRS maps](#). The boundaries depicted in this layer are not to be considered authoritative for in/out determinations close to a CBRS boundary (i.e., within the "CBRS Buffer Zone" that appears as a shaded area on the right side of the boundary). For projects that are very close to a CBRS boundary but do not directly intersect a unit, you may contact the Svi for an official determination by following the instructions at: <https://www.fws.gov/service/coastal-barrier-resources-system-property-documentation>

Data exclusion

CBRS units extend outward to a 20- or 30-foot bathymetric contour (depending on the location of the unit). Structures outward of the units is not shown in the CBRS data, but for projects in the offshore areas of units (e.g., dredging, breakwaters, offshore wind energy or oil and gas projects) may be subject to CBRA even if they do not intersect CBRS data. For additional information, please contact CBRA@fws.gov. c

Facilities

Wildlife refuges and fish hatcheries

Refuge and fish hatchery information is not available at this time

Wetlands in the National Wetlands Inventory (NWI)

Impacts to [wetlands](#) and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

Wetland information is not available at this time

This can happen when the National Wetlands Inventory (NWI) map service is unavailable, or for very large projects that intersect many wetland areas. Try again, or visit the [map](#) to view wetlands at this location.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and topography. A major error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tubercid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate Federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Virginia Ecological Services Field Office

6669 Short Lane

Gloucester, VA 23061-4410

Phone: (804) 693-6694



In Reply Refer To:

12/21/2025 18:20:33 UTC

Project Code: 2026-0029639

Project Name: Federal Participation in the Aquatic Plant Control Program for Water Chestnut Management in Maryland

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*). Any activity proposed on National Wildlife Refuge lands must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<https://www.fws.gov/sites/default/files/documents/endangered-species-consultation-handbook.pdf>

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts, see <https://www.fws.gov/program/migratory-bird-permit/what-we-do>.

It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures, see <https://www.fws.gov/library/collections/threats-birds>.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit <https://www.fws.gov/partner/council-conservation-migratory-birds>.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Project Code in the header of this

letter with any request for consultation or correspondence about your project that you submit to our office.

Note: IPaC has provided all available attachments because this project is in multiple field office jurisdictions.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Bald & Golden Eagles
- Migratory Birds
- Wetlands

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Virginia Ecological Services Field Office

6669 Short Lane

Gloucester, VA 23061-4410

(804) 693-6694

This project's location is within the jurisdiction of multiple offices. However, only one species list document will be provided for all offices. The species and critical habitats in this document reflect the aggregation of those that fall in each of the affiliated office's jurisdiction. Other offices affiliated with the project:

Chesapeake Bay Ecological Services Field Office

177 Admiral Cochrane Drive

Annapolis, MD 21401-7307

(410) 573-4599

PROJECT SUMMARY

Project Code: 2026-0029639

Project Name: Federal Participation in the Aquatic Plant Control Program for Water Chestnut Management in Maryland

Project Type: Biological Control

Project Description: The project is Federal participation in a cost-shared project with the Metropolitan Washington Council of Governments (MWCOC) to manage water chestnut across a broad geographic scope, to include Maryland, Washington D.C., and Virginia. Implementation of management measures by MWCOC is scheduled to begin in the summer of 2026 and will initially target 42 waterbodies within Virginia and Maryland with observations of water chestnut presence. The cost-shared project and treatment of water chestnut under a cost-share agreement will continue into future years as funding is available and work is necessary to manage the spread of these invasive aquatic plants in Maryland, D.C., and Virginia.

The preferred alternative includes a suite of management methods that could be used alone or in conjunction to reduce the populations and spread of these two species of water chestnut, and to enable rapid response to new infestations. Management methods included in the preferred alternative include:

Manual removal of water chestnut by hand-pulling localized populations of plants, accessed by wading or small boats.

Mechanical management of water chestnut through the use of mechanical harvesters, such as a cutters or hydro-rakes. This method includes cutting, pulling, or tilling to eliminate unwanted vegetation. Mechanical harvesting is most effective in densely invaded areas (>25% water chestnut surface area coverage), where plants are growing in mats.

Chemical treatment of water chestnut with herbicides registered and licensed for aquatic use by the U.S. Environmental Protection Agency and covered by General Permits for aquatic pesticide use in Maryland, Virginia, and Washington D.C. Herbicides used for treatment will primarily include imazamox, flumioxazin, 2,4-D, trichlopyr, and fluridone; although, other licensed herbicides proven effective for water chestnut treatment could be used in future management efforts.

Project Location:

The approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@38.8269454,-77.16204006462435,14z>

ENDANGERED SPECIES ACT SPECIES

There is a total of 5 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

-
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Northern Long-eared Bat <i>Myotis septentrionalis</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Endangered
Tricolored Bat <i>Perimyotis subflavus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

CLAMS

NAME	STATUS
Green Floater <i>Lasmigona subviridis</i> There is proposed critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/7541	Proposed Threatened

INSECTS

NAME	STATUS
Monarch Butterfly <i>Danaus plexippus</i> There is proposed critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/9743	Proposed Threatened

FLOWERING PLANTS

NAME	STATUS
Small Whorled Pogonia <i>Isotria medeoloides</i> Population: No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1890	Threatened

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

USFWS NATIONAL WILDLIFE REFUGE LANDS AND FISH HATCHERIES

Any activity proposed on lands managed by the [National Wildlife Refuge](#) system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

BALD & GOLDEN EAGLES

Bald and Golden Eagles are protected under the Bald and Golden Eagle Protection Act ² and the Migratory Bird Treaty Act (MBTA) ¹. Any person or organization who plans or conducts activities that may result in impacts to Bald or Golden Eagles, or their habitats, should follow appropriate regulations and consider implementing appropriate avoidance and minimization measures, as described in the various links on this page.

-
1. The [Bald and Golden Eagle Protection Act](#) of 1940.
 2. The [Migratory Birds Treaty Act](#) of 1918.
 3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

There are Bald Eagles and/or Golden Eagles in your [project](#) area.

Measures for Proactively Minimizing Eagle Impacts

For information on how to best avoid and minimize disturbance to nesting bald eagles, please review the [National Bald Eagle Management Guidelines](#). You may employ the timing and activity-specific distance recommendations in this document when designing your project/ activity to avoid and minimize eagle impacts. For bald eagle information specific to Alaska, please refer to [Bald Eagle Nesting and Sensitivity to Human Activity](#).

The FWS does not currently have guidelines for avoiding and minimizing disturbance to nesting Golden Eagles. For site-specific recommendations regarding nesting Golden Eagles, please consult with the appropriate Regional [Migratory Bird Office](#) or [Ecological Services Field Office](#).

If disturbance or take of eagles cannot be avoided, an [incidental take permit](#) may be available to authorize any take that results from, but is not the purpose of, an otherwise lawful activity. For assistance making this determination for Bald Eagles, visit the [Do I Need A Permit Tool](#). For assistance making this determination for golden eagles, please consult with the appropriate Regional [Migratory Bird Office](#) or [Ecological Services Field Office](#).

Ensure Your Eagle List is Accurate and Complete

If your project area is in a poorly surveyed area in IPaC, your list may not be complete and you may need to rely on other resources to determine what species may be present (e.g. your local FWS field office, state surveys, your own surveys). Please review the [Supplemental Information](#)

on [Migratory Birds and Eagles](#), to help you properly interpret the report for your specified location, including determining if there is sufficient data to ensure your list is accurate.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to bald or golden eagles on your list, see the "Probability of Presence Summary" below to see when these bald or golden eagles are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle <i>Haliaeetus leucocephalus</i> This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Sep 1 to Aug 31
Golden Eagle <i>Aquila chrysaetos</i> This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1680	Breeds elsewhere

PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read ["Supplemental Information on Migratory Birds and Eagles"](#), specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

Breeding Season (■)

Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

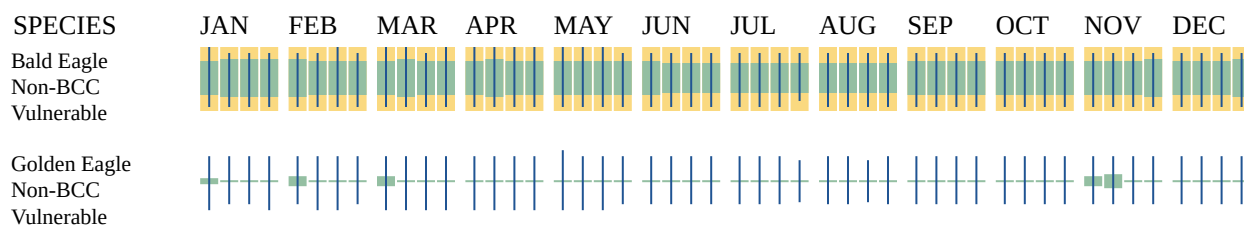
Survey Effort (|)

Vertical black lines; the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data (—)

A week is marked as having no data if there were no survey events for that week.

■ probability of presence ■ breeding season | survey effort — no data



Additional information can be found using the following links:

- Eagle Management <https://www.fws.gov/program/eagle-management>
- Measures for avoiding and minimizing impacts to birds <https://www.fws.gov/library/collections/avoiding-and-minimizing-incident-take-migratory-birds>
- Nationwide avoidance and minimization measures for birds <https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf>
- Supplemental Information for Migratory Birds and Eagles in IPaC <https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action>

MIGRATORY BIRDS

The Migratory Bird Treaty Act (MBTA) ¹ prohibits the take (including killing, capturing, selling, trading, and transport) of protected migratory bird species without prior authorization by the Department of Interior U.S. Fish and Wildlife Service (Service).

1. The [Migratory Birds Treaty Act](#) of 1918.
2. The [Bald and Golden Eagle Protection Act](#) of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the "Probability of Presence Summary" below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle <i>Haliaeetus leucocephalus</i> This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Sep 1 to Aug 31

NAME	BREEDING SEASON
Black-billed Cuckoo <i>Coccyzus erythrophthalmus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9399	Breeds May 15 to Oct 10
Blue-winged Warbler <i>Vermivora cyanoptera</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9509	Breeds May 1 to Jun 30
Bobolink <i>Dolichonyx oryzivorus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9454	Breeds May 20 to Jul 31
Canada Warbler <i>Cardellina canadensis</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9643	Breeds May 20 to Aug 10
Cerulean Warbler <i>Setophaga cerulea</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/2974	Breeds Apr 28 to Jul 20
Chimney Swift <i>Chaetura pelagica</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9406	Breeds Mar 15 to Aug 25
Chuck-will's-widow <i>Antrostomus carolinensis</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9604	Breeds May 10 to Jul 10
Eastern Whip-poor-will <i>Antrostomus vociferus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/10678	Breeds May 1 to Aug 20
Golden Eagle <i>Aquila chrysaetos</i> This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1680	Breeds elsewhere
Grasshopper Sparrow <i>Ammodramus savannarum perpallidus</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/8329	Breeds Jun 1 to Aug 20

NAME	BREEDING SEASON
Kentucky Warbler <i>Geothlypis formosa</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9443	Breeds Apr 20 to Aug 20
King Rail <i>Rallus elegans</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8936	Breeds May 1 to Sep 5
Least Tern <i>Sternula antillarum antillarum</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/11919	Breeds Apr 25 to Sep 5
Lesser Yellowlegs <i>Tringa flavipes</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9679	Breeds elsewhere
Long-eared Owl <i>asio otus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3631	Breeds Mar 1 to Jul 15
Pectoral Sandpiper <i>Calidris melanotos</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9561	Breeds elsewhere
Prairie Warbler <i>Setophaga discolor</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9513	Breeds May 1 to Jul 31
Prothonotary Warbler <i>Protonotaria citrea</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9439	Breeds Apr 1 to Jul 31
Red-headed Woodpecker <i>Melanerpes erythrocephalus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9398	Breeds May 10 to Sep 10
Ruddy Turnstone <i>Arenaria interpres morinella</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/10633	Breeds elsewhere

NAME	BREEDING SEASON
Rusty Blackbird <i>Euphagus carolinus</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9478	Breeds elsewhere
Scarlet Tanager <i>Piranga olivacea</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/11967	Breeds May 10 to Aug 10
Semipalmated Sandpiper <i>Calidris pusilla</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9603	Breeds elsewhere
Short-billed Dowitcher <i>Limnodromus griseus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9480	Breeds elsewhere
Willet <i>Tringa semipalmata</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/10669	Breeds Apr 20 to Aug 5
Wood Thrush <i>Hylocichla mustelina</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9431	Breeds May 10 to Aug 31

PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "[Supplemental Information on Migratory Birds and Eagles](#)", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

Breeding Season (■)

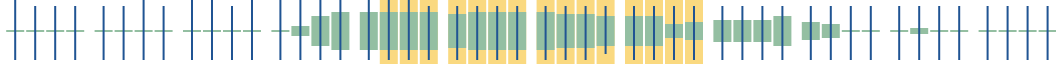
Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

Survey Effort (|)

BCC Rangewide
(CON)



Wood Thrush
BCC Rangewide
(CON)



Additional information can be found using the following links:

- Eagle Management <https://www.fws.gov/program/eagle-management>
- Measures for avoiding and minimizing impacts to birds <https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds>
- Nationwide avoidance and minimization measures for birds
- Supplemental Information for Migratory Birds and Eagles in IPaC <https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action>

WETLANDS

Impacts to [NWI wetlands](#) and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

WETLAND INFORMATION WAS NOT AVAILABLE WHEN THIS SPECIES LIST WAS GENERATED.
PLEASE VISIT [HTTPS://WWW.FWS.GOV/WETLANDS/DATA/MAPPER.HTML](https://www.fws.gov/wetlands/data/mapper.html) OR CONTACT THE FIELD OFFICE FOR FURTHER INFORMATION.

IPAC USER CONTACT INFORMATION

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In Reply Refer To:

12/21/2025 18:44:41 UTC

Project code: 2026-0029639

Project Name: Federal Participation in the Aquatic Plant Control Program for Water Chestnut Management in Maryland

Federal Nexus: yes

Federal Action Agency (if applicable): Army Corps of Engineers

Subject: Federal agency coordination under the Endangered Species Act, Section 7 for 'Federal Participation in the Aquatic Plant Control Program for Water Chestnut Management in Maryland'

Dear Kristina May:

This letter records your determination using the Information for Planning and Consultation (IPaC) system provided to the U.S. Fish and Wildlife Service (Service) on December 21, 2025, for "Federal Participation in the Aquatic Plant Control Program for Water Chestnut Management in Maryland" (here forward, Project). This project has been assigned Project Code 2026-0029639 and all future correspondence should clearly reference this number.

The Service developed the IPaC system and associated species' determination keys in accordance with the Endangered Species Act of 1973 (ESA; 87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.) and based on a standing analysis. All information submitted by the Project proponent into the IPaC must accurately represent the full scope and details of the Project. Failure to accurately represent or implement the Project as detailed in IPaC or the Northeast Determination Key (DKey), invalidates this letter. **Answers to certain questions in the DKey commit the project proponent to implementation of conservation measures that must be followed for the ESA determination to remain valid.**

To make a no effect determination, the full scope of the proposed project implementation (action) should not have any effects (either positive or negative effect(s)), to a federally listed species or designated critical habitat. Effects of the action are all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area

involved in the action. (See § 402.17). Under Section 7 of the ESA, if a federal action agency makes a no effect determination, no further consultation with, or concurrence from, the Service is required (ESA §7). If a proposed Federal action may affect a listed species or designated critical habitat, formal consultation is required (except when the Service concurs, in writing, that a proposed action "is not likely to adversely affect" listed species or designated critical habitat [50 CFR §402.02, 50 CFR§402.13]).

The IPaC results indicated the following species is (are) potentially present in your project area and, based on your responses to the Service's Northeast DKey, you determined the proposed Project will have the following effect determinations:

Species	Listing Status	Determination
Green Floater (<i>Lasmigona subviridis</i>)	Proposed Threatened	No effect
Small Whorled Pogonia (<i>Isotria medeoloides</i>)	Threatened	No effect

Conclusion If there are no updates on listed species, no further consultation/coordination for this project is required for the species identified above. However, the Service recommends that project proponents re-evaluate the Project in IPaC if: 1) the scope, timing, duration, or location of the Project changes (includes any project changes or amendments); 2) new information reveals the Project may impact (positively or negatively) federally listed species or designated critical habitat; or 3) a new species is listed, or critical habitat designated. If any of the above conditions occurs, additional consultation with the Service should take place before project implements any changes which are final or commits additional resources.

Other Species and Critical Habitat that May be Present in the Action Area

In addition to the species listed above, the following species and/or critical habitats may also occur in your project area and are not covered by this conclusion:

- Monarch Butterfly *Danaus plexippus* Proposed Threatened
- Northern Long-eared Bat *Myotis septentrionalis* Endangered
- Tricolored Bat *Perimyotis subflavus* Proposed Endangered

Please Note: If the Action may impact bald or golden eagles, additional coordination with the Service under the Bald and Golden Eagle Protection Act (BGEPA) (54 Stat. 250, as amended, 16 U.S.C. 668a-d) by the prospective permittee may be required. Please contact the Migratory Birds Permit Office, (413) 253-8643, or PermitsR5MB@fws.gov, with any questions regarding potential impacts to Eagles.

If you have any questions regarding this letter or need further assistance, please contact the Assistant Regional Director-Ecological Services and reference the Project Code associated with this Project.

Action Description

You provided to IPaC the following name and description for the subject Action.

1. Name

Federal Participation in the Aquatic Plant Control Program for Water Chestnut Management in Maryland

2. Description

The following description was provided for the project 'Federal Participation in the Aquatic Plant Control Program for Water Chestnut Management in Maryland':

The project is Federal participation in a cost-shared project with the Metropolitan Washington Council of Governments (MWWOG) to manage water chestnut across a broad geographic scope, to include Maryland, Washington D.C., and Virginia. Implementation of management measures by MWWOG is scheduled to begin in the summer of 2026 and will initially target 42 waterbodies within Virginia and Maryland with observations of water chestnut presence. The cost-shared project and treatment of water chestnut under a cost-share agreement will continue into future years as funding is available and work is necessary to manage the spread of these invasive aquatic plants in Maryland, D.C., and Virginia.

The preferred alternative includes a suite of management methods that could be used alone or in conjunction to reduce the populations and spread of these two species of water chestnut, and to enable rapid response to new infestations. Management methods included in the preferred alternative include:

Manual removal of water chestnut by hand-pulling localized populations of plants, accessed by wading or small boats.

Mechanical management of water chestnut through the use of mechanical harvesters, such as cutters or hydro-rakes. This method includes cutting, pulling, or tilling to eliminate unwanted vegetation. Mechanical harvesting is most effective in densely invaded areas (>25% water chestnut surface area coverage), where plants are growing in mats.

Chemical treatment of water chestnut with herbicides registered and licensed for aquatic use by the U.S. Environmental Protection Agency and covered by General Permits for aquatic pesticide use in Maryland, Virginia, and Washington D.C. Herbicides used for treatment will primarily include imazamox, flumioxazin, 2,4-D, trichlopyr, and fluridone; although, other licensed herbicides proven effective for water chestnut treatment could be used in future management efforts.

The approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@38.8269454,-77.16204006462435,14z>

QUALIFICATION INTERVIEW

1. As a representative of this project, do you agree that all items submitted represent the complete scope of the project details and you will answer questions truthfully?

Yes

2. Does the proposed project include, or is it reasonably certain to cause, intentional take of listed species?

Note: This question could refer to research, direct species management, surveys, and/or studies that include intentional handling/encountering, harassment, collection, or capturing of any individual of a federally listed threatened, endangered, or proposed species.

No

3. Is the action authorized, permitted, licensed, funded, or being carried out by a Federal agency in whole or in part?

Note: for projects in Pennsylvania: Projects requiring authorization under Section 404 of the Clean Water Act and/or Section 10 of the Rivers and Harbors Act would be considered as having a federal nexus. Since the U.S. Army Corps of Engineers (Corps) has issued the Pennsylvania State Programmatic General Permit (PASPGP), which may be verified by the PA Department of Environmental Protection or certain Conservation Districts, the need to receive a Corps authorization to perform the work under the PASPGP serves as a federal nexus. As such, if proposing to use the PASPGP, you would answer 'yes' to this question.

Yes

4. Are you including in this analysis all impacts to federally listed species that may result from the entirety of the project (not just the activities under federal jurisdiction)?

Note: If there are project activities that will impact listed species that are considered to be outside of the jurisdiction of the federal action agency submitting this key, contact your local Ecological Services Field Office to determine whether it is appropriate to use this key. If your Ecological Services Field Office agrees that impacts to listed species that are outside the federal action agency's jurisdiction will be addressed through a separate process, you can answer yes to this question and continue through the key.

Yes

5. Are you the lead federal action agency or designated non-federal representative requesting concurrence on behalf of the lead Federal Action Agency?

Yes

6. Is the lead federal action agency the Environmental Protection Agency (EPA) or Federal Communications Commission (FCC)?

No

7. Is the lead federal action agency the Federal Energy Regulatory Commission (FERC)?

No

8. Is the lead federal action agency the Natural Resources Conservation Service?

No

9. Will the proposed project involve the use or storage of herbicide?

Yes

10. Will the proposed project involve herbaceous native vegetation removal (including prescribed fire that would result in burning of plants) or mowing?

No

11. Does any component of the project associated with this action include activities or structures that may pose a collision risk to **birds** (e.g., plane-based surveys, new or enlarged communication towers or broadcast towers, high voltage transmission lines, any type of towers with or without guy wires)?

No

12. Will the proposed project involve demolition, rehabilitation, property elevation, renovation, and/or rebuilding of one or more existing buildings (e.g., residential, commercial and industrial buildings, or utilities)? Note: if project activities include modification of bridges and/or culverts, answer this question "No".

No

13. Are federally listed freshwater mussels known to be present in the action area?

Note: If unsure, contact the appropriate Ecological Services Field Office for additional information or answer "NO" and continue through the key.

Yes

14. Will the proposed project result in **permanent** changes to surface water or groundwater quantity, retention, quality or timing?

Note: Projects may affect stream flow, surface water, or groundwater through various activities such as; water withdrawal, water recharge, well drilling, infiltration impacts, stormwater outlets, hydropower production, water impoundments, intake structures, stream diversion, mining operations, dams, surface water drainage, or hydroelectric turbines.

If a project only involves temporary and limited reductions in water that will not displace listed species or significantly alter their water availability (meaning there are no changes to their feeding, breeding, or sheltering), you can answer "No" to this question.

This question specifically addresses the quantity of water in a stream. Other water quality issues, such as sedimentation and turbidity, will be covered in subsequent questions.

No

15. Does the project include activity in or within 300 feet of a freshwater wetland?

Note: This encompasses various project activities related to wetlands, including activities taking place within wetlands, activities occurring within 300 feet of wetlands that could impact them, and water withdrawals and/or discharge of contaminants, even if covered by a National Pollutant Discharge Elimination System (NPDES) permit.

Examples of such activities include, but are not limited to; wetland draining, ditching, tilling, filling, excavation, stream diversion, impoundments, mowing, grazing vegetation, construction of access roads, creation of detention basins, installation of water or sewer lines, irrigation, increase of impervious surfaces, and application of pesticides, deicing agents, or fertilizers..

Yes

16. Will the proposed project activities (including upland project activities) occur within 0.5 miles of the water's edge of a stream or tributary of a stream where listed species may be present?

Yes

17. Will the proposed project directly affect a streambed (below ordinary high water mark (OHWM)) of the stream?

Yes

18. Will the proposed project bore underneath (directional bore or horizontal directional drill) a stream where listed species may be present?

No

19. Will the proposed project involve a new point source discharge into a stream or change an existing point source discharge (e.g., outfalls; leachate ponds, fracking fluid) including changes to pH, temperature and/or chemical composition (e.g., chloride, nickel, etc.)?

No

20. Will the proposed project involve the removal of sediment or debris, dredging or in-stream gravel mining where listed species may be present?

No

21. Will the proposed project involve the creation of a new water-borne contaminant source where listed species may be present?

Note: New water-borne contaminant sources occur through improper storage, usage, or creation of chemicals. For example: leachate ponds and pits containing chemicals that are not NSF/ANSI 60 compliant have contaminated waterways. Sedimentation will be addressed in a separate question.

No

22. Will the proposed project involve perennial stream loss, in a stream or tributary of a stream where listed species may be present, that would require an individual permit under 404 of the Clean Water Act?

No

23. Will the proposed project involve pesticide use or storage within 200 feet of a karst feature or

perennial stream bank where aquatic listed species may be present?

Yes

24. Will the proposed project include activities that could negatively affect fish movement temporarily or permanently (including fish stocking, harvesting, or creation of barriers to fish passage).

No

25. Will the proposed project involve earth moving or other ground disturbance that could cause erosion and sedimentation, and/or contamination within 300 feet of a freshwater wetland or along a stream?

Note: Answer "Yes" to this question if erosion and sediment control measures will be used.

Yes

26. Will the proposed project impact streams or tributaries of streams where listed species may be present through activities such as, but not limited to, valley fills, large-scale vegetation removal that could result in ground destabilization, and/or change in site topography?

No

27. Will the proposed project involve vegetation removal within 300 feet of a perennial stream bank where aquatic listed species may be present?

Yes

28. Will erosion and sedimentation control Best Management Practices (BMPs) associated with applicable state and/or Federal permits, be applied to the project?

Note: If BMPs have been provided by and/or coordinated with and approved by the appropriate Ecological Services Field Office, answer "Yes" to this question.

Yes

29. Is the project being funded, lead, or managed in whole or in part by U.S Fish and Wildlife Restoration and Recovery Program (e.g., Partners, Coastal, Fisheries, Wildlife and Sport Fish Restoration, Refuges)?

No

30. Will the proposed project involve temporary or permanent modification to hydrology, including groundwater recharge, and/or damming upstream or downstream of listed plant habitat, that could result in changes to water quality, water quantity, or timing of water availability in proximity to listed plants?

No

31. Will the proposed project involve sedimentation in areas where listed plants may be present?

No

32. Will the proposed project involve ground disturbance in areas where listed plants may be present?
No
33. Does the project intersect the small whorled pogonia species list area?
Automatically answered
Yes
34. Does the project occur within closed canopy mixed-deciduous or mixed-deciduous/coniferous forests that are generally in second- or third-growth successional stages?
No
35. Does the project area intersect the Species List Area of the Green Floater Mussel?
Automatically answered
Yes
36. Does the project intersect the Small-anthered bittercress species list area?
Automatically answered
No
37. Does the project intersect the Smooth Coneflower species list area?
Automatically answered
No
38. Do you have any other documents that you want to include with this submission?
No

PROJECT QUESTIONNAIRE

1. Approximately how many acres of trees would the proposed project remove?
0
2. Approximately how many total acres of disturbance are within the disturbance/
construction limits of the proposed project?
5
3. Briefly describe the habitat within the construction/disturbance limits of the project site.
42 freshwater ponds and lakes throughout MD, VA, and D.C.

IPAC USER CONTACT INFORMATION

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United States Department of the Interior

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In Reply Refer To:

12/21/2025 18:35:11 UTC

Project code: 2026-0029639

Project Name: Federal Participation in the Aquatic Plant Control Program for Water Chestnut Management in Maryland

Federal Nexus: yes

Federal Action Agency (if applicable): Army Corps of Engineers

Subject: Federal agency coordination under the Endangered Species Act, Section 7 for 'Federal Participation in the Aquatic Plant Control Program for Water Chestnut Management in Maryland'

Dear Kristina May:

This letter records your determination using the Information for Planning and Consultation (IPaC) system provided to the U.S. Fish and Wildlife Service (Service) on December 21, 2025, for 'Federal Participation in the Aquatic Plant Control Program for Water Chestnut Management in Maryland' (here forward, Project). This project has been assigned Project Code 2026-0029639 and all future correspondence should clearly reference this number. **Please carefully review this letter. Your Endangered Species Act (Act) requirements may not be complete.**

Ensuring Accurate Determinations When Using IPaC

The Service developed the IPaC system and associated species' determination keys in accordance with the Endangered Species Act of 1973 (ESA; 87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.) and based on a standing analysis. All information submitted by the Project proponent into IPaC must accurately represent the full scope and details of the Project.

Failure to accurately represent or implement the Project as detailed in IPaC or the Northern Long-eared Bat and Tricolored Bat Range-wide Determination Key (DKey), invalidates this letter. ***Answers to certain questions in the DKey commit the project proponent to implementation of conservation measures that must be followed for the ESA determination to remain valid. Note that conservation measures for northern long-eared bat and tricolored bat may differ. If both bat species are present in the action area and the key suggests more conservative measures for one of the species for your Project, the Project may need to apply***

the most conservative measures in order to avoid adverse effects. If unsure which conservation measures should be applied, please contact the appropriate Ecological Services Field Office.

Determination for the Northern Long-Eared Bat and Tricolored Bat

Based on your IPaC submission and a standing analysis completed by the Service, you determined the proposed Project will have the following effect determinations:

Species	Listing Status	Determination
Northern Long-eared Bat (<i>Myotis septentrionalis</i>)	Endangered	NLAA
Tricolored Bat (<i>Perimyotis subflavus</i>)	Proposed Endangered	NLAA

Federal agencies must consult with U.S. Fish and Wildlife Service under section 7(a)(2) of the Endangered Species Act (ESA) when an action *may affect* a listed species. Tricolored bat is proposed for listing as endangered under the ESA, but not yet listed. For actions that may affect a proposed species, agencies cannot consult, but they can *confer* under the authority of section 7(a)(4) of the ESA. Such conferences can follow the procedures for a consultation and be adopted as such if and when the proposed species is listed. Should the tricolored bat be listed, agencies must review projects that are not yet complete, or projects with ongoing effects within the tricolored bat range that previously received a NE or NLAA determination from the key to confirm that the determination is still accurate.

Unless the Service advises you within 15 days of the date of this letter that your IPaC-assisted determination was incorrect, this letter verifies that consultation on the Action is complete for northern long-eared bat and/or tricolored bat and no further action is necessary unless either of the following occurs:

- new information reveals effects of the action that may affect the northern long-eared bat or tricolored bat in a manner or to an extent not previously considered; or,
- the identified action is subsequently modified in a manner that causes an effect to the northern long-eared bat or tricolored bat that was not considered when completing the determination key.

15-Day Review Period

As indicated above, the Service will notify you within 15 calendar days if we determine that this proposed Action does not meet the criteria for a “may affect, not likely to adversely affect” (NLAA) determination for the northern long-eared bat and/or tricolored bat. If we do not notify you within that timeframe, you may proceed with the Action under the terms of the NLAA concurrence provided here. This verification period allows the identified Ecological Services Field Office to apply local knowledge to evaluation of the Action, as we may identify a small subset of actions having impacts that we did not anticipate when developing the key. In such cases, the identified Ecological Services Field Office may request additional information to verify the effects determination reached through the Northern Long-eared Bat and Tricolored Bat DKey.

Other Species and Critical Habitat that May be Present in the Action Area

The IPaC-assisted determination key for the northern long-eared bat and tricolored bat does not apply to the following ESA-protected species and/or critical habitat that also may occur in your Action area:

- Green Floater *Lasmigona subviridis* Proposed Threatened
- Monarch Butterfly *Danaus plexippus* Proposed Threatened
- Small Whorled Pogonia *Isotria medeoloides* Threatened

You may coordinate with our Office to determine whether the Action may affect the species and/or critical habitat listed above. Note that reinitiation of consultation would be necessary if a new species is listed or critical habitat designated that may be affected by the identified action before it is complete.

If you have any questions regarding this letter or need further assistance, please contact the Assistant Regional Director-Ecological Services and reference Project Code 2026-0029639 associated with this Project.

Action Description

You provided to IPaC the following name and description for the subject Action.

1. Name

Federal Participation in the Aquatic Plant Control Program for Water Chestnut Management in Maryland

2. Description

The following description was provided for the project 'Federal Participation in the Aquatic Plant Control Program for Water Chestnut Management in Maryland':

The project is Federal participation in a cost-shared project with the Metropolitan Washington Council of Governments (MWWOG) to manage water chestnut across a broad geographic scope, to include Maryland, Washington D.C., and Virginia. Implementation of management measures by MWWOG is scheduled to begin in the summer of 2026 and will initially target 42 waterbodies within Virginia and Maryland with observations of water chestnut presence. The cost-shared project and treatment of water chestnut under a cost-share agreement will continue into future years as funding is available and work is necessary to manage the spread of these invasive aquatic plants in Maryland, D.C., and Virginia.

The preferred alternative includes a suite of management methods that could be used alone or in conjunction to reduce the populations and spread of these two species of water chestnut, and to enable rapid response to new infestations. Management methods included in the preferred alternative include:

Manual removal of water chestnut by hand-pulling localized populations of plants, accessed by wading or small boats.

Mechanical management of water chestnut through the use of mechanical harvesters, such as cutters or hydro-rakes. This method includes cutting, pulling, or tilling to eliminate unwanted vegetation. Mechanical harvesting is most effective in densely invaded areas (>25% water chestnut surface area coverage), where plants are growing in mats.

Chemical treatment of water chestnut with herbicides registered and licensed for aquatic use by the U.S. Environmental Protection Agency and covered by General Permits for aquatic pesticide use in Maryland, Virginia, and Washington D.C. Herbicides used for treatment will primarily include imazamox, flumioxazin, 2,4-D, trichlopyr, and fluridone; although, other licensed herbicides proven effective for water chestnut treatment could be used in future management efforts.

The approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@38.8269454,-77.16204006462435,14z>



DETERMINATION KEY RESULT

Based on the answers provided, the proposed Action is consistent with a determination of “may affect, but not likely to adversely affect” for a least one species covered by this determination key.

QUALIFICATION INTERVIEW

1. Does the proposed project include, or is it reasonably certain to cause, intentional take of listed bats or any other listed species?

Note: Intentional take is defined as take that is the intended result of a project. Intentional take could refer to research, direct species management, surveys, and/or studies that include intentional handling/encountering, harassment, collection, or capturing of any individual of a federally listed threatened, endangered or proposed species?

No

2. Is the action area wholly within Zone 2 of the year-round active area for northern long-eared bat and/or tricolored bat?

Automatically answered

No

3. Does the action area intersect Zone 1 of the year-round active area for northern long-eared bat and/or tricolored bat?

Automatically answered

No

4. Does any component of the action involve leasing, construction or operation of wind turbines? Answer 'yes' if the activities considered are conducted with the intention of gathering survey information to inform the leasing, construction, or operation of wind turbines.

No

5. Is the proposed action authorized, permitted, licensed, funded, or being carried out by a Federal agency in whole or in part?

Note for projects in Pennsylvania: Projects requiring authorization under Section 404 of the Clean Water Act and/or Section 10 of the Rivers and Harbors Act would be considered as having a federal nexus. Since the U.S. Army Corps of Engineers (Corps) has issued the Pennsylvania State Programmatic General Permit (PASPGP), which may be verified by the PA Department of Environmental Protection or certain Conservation Districts, the need to receive a Corps authorization to perform the work under the PASPGP serves as a federal nexus. As such, if proposing to use the PASPGP, you would answer ‘yes’ to this question.

Yes

6. Is the Federal Highway Administration (FHWA), Federal Railroad Administration (FRA), or Federal Transit Administration (FTA) funding or authorizing the proposed action, in whole or in part?

No

7. Are you an employee of the federal action agency or have you been officially designated in writing by the agency as its designated non-federal representative for the purposes of Endangered Species Act Section 7 informal consultation per 50 CFR § 402.08?

Note: This key may be used for federal actions and for non-federal actions to facilitate section 7 consultation and to help determine whether an incidental take permit may be needed, respectively. This question is for information purposes only.

Yes

8. Is the lead federal action agency the Environmental Protection Agency (EPA) or Federal Communications Commission (FCC)? Is the Environmental Protection Agency (EPA) or Federal Communications Commission (FCC) funding or authorizing the proposed action, in whole or in part?

No

9. Is the lead federal action agency the Federal Energy Regulatory Commission (FERC)?

No

10. [Semantic] Is the action area located within 0.5 miles of a known bat hibernaculum or winter roost? Note: The map queried for this question contains proprietary information and cannot be displayed. If you need additional information, please contact your state wildlife agency.

Automatically answered

No

11. Does the action area contain any winter roosts or caves (or associated sinkholes, fissures, or other karst features), mines, rocky outcroppings, or tunnels that could provide habitat for hibernating bats?

No

12. Will the action cause effects to a bridge?

Note: Covered bridges should be considered as bridges in this question.

No

13. Will the action result in effects to a culvert or tunnel at any time of year?

No

14. Are trees present within 1000 feet of the action area?

Note: If there are trees within the action area that are of a sufficient size to be potential roosts for bats answer "Yes". If unsure, additional information defining suitable summer habitat for the northern long-eared bat and tricolored bat can be found in Appendix A of the USFWS' Range-wide Indiana Bat and Northern long-eared bat Survey Guidelines at: <https://www.fws.gov/media/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines>.

Yes

15. Does the action include the intentional exclusion of bats from a building or building-like structure? **Note:** Exclusion is conducted to deny bats' entry or reentry into a building. To be effective and to avoid harming bats, it should be done according to established standards. If your action includes bat exclusion and you are unsure whether northern long-eared bats or tricolored bats are present, answer "Yes." Answer "No" if there are no signs of bat use in the building/structure. If unsure, contact your local Ecological Services Field Office to help assess whether northern long-eared bats or tricolored bats may be present. Contact a Nuisance Wildlife Control Operator (NWCO) for help in how to exclude bats from a structure safely without causing harm to the bats (to find a NWCO certified in bat standards, search the Internet using the search term "National Wildlife Control Operators Association bats"). Also see the White-Nose Syndrome Response Team's guide for bat control in structures.

No

16. Does the action involve removal, modification, or maintenance of a human-made building-like structure (barn, house, or other building) **known or suspected to contain roosting bats?**

No

17. Will the action cause construction of one or more new roads open to the public?

For federal actions, answer 'yes' when the construction or operation of these facilities is either (1) part of the federal action or (2) would not occur but for an action taken by a federal agency (federal permit, funding, etc.).

No

18. Will the action include or cause any construction or other activity that is reasonably certain to increase average night-time traffic permanently or temporarily on one or more existing roads? **Note:** For federal actions, answer 'yes' when the construction or operation of these facilities is either (1) part of the federal action or (2) would not occur but for an action taken by a federal agency (federal permit, funding, etc.). .

No

19. Will the action include or cause any construction or other activity that is reasonably certain to increase the number of travel lanes on an existing thoroughfare?

For federal actions, answer 'yes' when the construction or operation of these facilities is either (1) part of the federal action or (2) would not occur but for an action taken by a federal agency (federal permit, funding, etc.).

No

20. Will the proposed Action involve the creation of a new water-borne contaminant source (e.g., leachate pond, pits containing chemicals that are not NSF/ANSI 60 compliant)?

Note: For information regarding NSF/ANSI 60 please visit <https://www.nsf.org/knowledge-library/nsf-ansi-standard-60-drinking-water-treatment-chemicals-health-effects>

No

21. Will the proposed action involve the creation of a new point source discharge from a facility other than a water treatment plant or storm water system?

No

22. Will the action include drilling or blasting?

No

23. Will the action involve military training (e.g., smoke operations, obscurant operations, exploding munitions, artillery fire, range use, helicopter or fixed wing aircraft use at night)?

No

24. Will the proposed action involve the use of herbicides or pesticides (e.g., fungicides, insecticides, or rodenticides)?

Yes

25. Will the action include or result in herbicide use that may affect suitable summer habitat for the northern long-eared bat or tricolored bat?

Note: Additional information defining suitable summer habitat for the northern long-eared bat and tricolored bat can be found in Appendix A of the USFWS' Range-wide Indiana Bat and Northern long-eared bat Survey Guidelines at: <https://www.fws.gov/media/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines>.

No

26. Will the action include or cause the application or drift of pesticides (e.g., fungicides, insecticides, or rodenticides) into forested areas that are suitable summer habitat for the northern long-eared bat or tricolored bat?

Answer "Yes" if the application may result in transport (e.g., in water) or aerial drift of the pesticide into forested areas that are suitable summer habitat for the northern long-eared bat or tricolored bat.

Note: Additional information defining suitable summer habitat for the northern long-eared bat and tricolored bat can be found in Appendix A of the USFWS' Range-wide Indiana Bat and Northern long-eared bat Survey Guidelines at: <https://www.fws.gov/media/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines>.

No

27. Will the action include or cause activities that are reasonably certain to cause chronic or intense nighttime noise (above current levels of ambient noise in the area) in suitable summer habitat for the northern long-eared bat or tricolored bat during the active season?

Chronic noise is noise that is continuous or occurs repeatedly again and again for a long time. Sources of chronic or intense noise that could cause adverse effects to bats may include, but are not limited to: road traffic; trains; aircraft; industrial activities; gas compressor stations; loud music; crowds; oil and gas extraction; construction; and mining.

Note: Additional information defining suitable summer habitat for the northern long-eared bat and tricolored bat can be found in Appendix A of the USFWS' Range-wide Indiana Bat and Northern long-eared bat Survey Guidelines at: <https://www.fws.gov/media/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines>.

No

28. Does the action include, or is it reasonably certain to cause, the use of permanent or temporary artificial lighting within 1000 feet of suitable northern long-eared bat or tricolored bat roosting habitat?

Note: Additional information defining suitable summer habitat for the northern long-eared bat and tricolored bat can be found in Appendix A of the USFWS' Range-wide Indiana Bat and Northern long-eared bat Survey Guidelines at: <https://www.fws.gov/media/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines>.

No

29. Will the action include tree cutting or other means of knocking down or bringing down trees, tree topping, or tree trimming?

No

30. Will the proposed action result in the use of prescribed fire?

Note: If the prescribed fire action includes other activities than application of fire (e.g., tree cutting, fire line preparation) please consider impacts from those activities within the previous representative questions in the key. This set of questions only considers impacts from flame and smoke.

No

31. Does the action area intersect the northern long-eared bat species list area?

Automatically answered

Yes

32. [Semantic] Is the action area located within 0.5 miles of radius of an entrance/opening to any known NLEB hibernacula or winter roost? Note: The map queried for this question contains proprietary information and cannot be displayed. If you need additional information, please contact your State wildlife agency.

Automatically answered

No

33. [Semantic] Is the action area located within 0.25 miles of a culvert that is known to be occupied by northern long-eared or tricolored bats? **Note:** The map queried for this question contains proprietary information and cannot be displayed. If you need additional information, please contact your State wildlife agency.

Automatically answered

No

34. [Semantic] Is the action area located within 150 feet of a documented northern long-eared bat roost site?

Note: The map queried for this question contains proprietary information and cannot be displayed. If you need additional information, please contact your State wildlife agency. Have you contacted the appropriate agency to determine if your action is within 150 feet of any documented northern long-eared bat roosts?

Note: A document with links to Natural Heritage Inventory databases and other state-specific sources of information on the locations of northern long-eared bat roosts is available here. Location information for northern long-eared bat roosts is generally kept in state natural heritage inventory databases – the availability of this data varies by state. Many states provide online access to their data, either directly by providing maps or by providing the opportunity to make a data request. In some cases, to protect those resources, access to the information may be limited.

Automatically answered

No

35. Is suitable summer habitat for the northern long-eared bat present within 1000 feet of project activities?

If unsure, answer "Yes."

Note: Additional information defining suitable summer habitat for the northern long-eared bat and tricolored bat can be found in Appendix A of the USFWS' Range-wide Indiana Bat and Northern long-eared bat Survey Guidelines at: <https://www.fws.gov/media/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines>.

Yes

36. Does the action area intersect the tricolored bat species list area?

Automatically answered

Yes

37. Is the action area located within 0.5-mile of radius of an entrance/opening to any known tricolored bat hibernacula or winter roost?

Note: The map queried for this question contains proprietary information and cannot be displayed. If you need additional information, please contact your state wildlife agency.

Automatically answered

No

38. [Semantic] Is the action area located within 0.25 miles of a culvert that is known to be occupied by northern long-eared or tricolored bats? **Note:** The map queried for this question contains proprietary information and cannot be displayed. If you need additional information, please contact your State wildlife agency.

Automatically answered

No

39. Is suitable summer habitat for the tricolored bat present within 1000 feet of project activities?
(If unsure, answer ""Yes."")

Note: If there are trees within the action area that may provide potential roosts for tricolored bats (e.g., clusters of leaves in live and dead deciduous trees, Spanish moss (*Tillandsia usneoides*), clusters of dead pine needles of large live pines) answer ""Yes."" For a complete definition of suitable summer habitat for the tricolored bat, please see Appendix A in the [Service's Range-wide Indiana Bat and Northern long-eared Bat Survey Guidelines](#).

Yes

40. Do you have any documents that you want to include with this submission?

No

PROJECT QUESTIONNAIRE

IPAC USER CONTACT INFORMATION

Agency: Army Corps of Engineers
Name: Kristina May
Address: 2 Hopkins Plaza
Address Line 2: Planning Division
City: Baltimore
State: MD
Zip: 21201
Email: kristina.k.may@usace.army.mil
Phone: 4109626100

Endangered Species Act Review

EVALUATING: RUSTY PATCHED BUMBLEBEE RANGEWIDE DETERMINATION KEY

Qualification interview

The following questions will determine whether this key applies to your project and provide guidance to help you make appropriate determinations for the species covered by this key.

1. Does the proposed action involve wind or solar energy? 0.0

☒ No

2. Is the action authorized, funded, or being carried out by a Federal agency? 1.0

☒ Yes

3. Are you the Federal agency or designated non-federal representative? 1.1

☒ Yes

4. Does the action area overlap with a rusty patched bumble bee high potential zone? 1.3

☒ Automatically answered

Yes

5. Does the action include - or is it reasonably certain to cause - intentional take of rusty patched bumble bee (rusty patched bumble bee) that is not covered under a scientific recovery permit under section 10(A)1(a) of the Endangered Species Act or under a cooperative agreement with a state agency? 13.0

Note: This could include, for example, surveys or studies that include handling or capture of the species. Whether "Project Review" surveys using USFWS protocols were conducted as part of the action is addressed later in this key.

☒ No

6. Will the action be authorized, funded, or carried out by the U.S. Forest Service for implementation on the Monongahela, George Washington, or Jefferson National Forest? 14.1

☒ No

7. Does the action include – or is it reasonably certain to result in – construction of one or more new roads or rail lines that will increase vehicle traffic in a rusty patched bumble bee HPZ? 18.0

☒ No

8. Does the action include – or is it reasonably certain to result in – the addition of travel lanes that are likely to increase vehicle traffic on one or more existing roads that will increase vehicle traffic in a rusty patched bumble bee HPZ? 19.0

☒ No

9. Is an increase in vehicular traffic in one or more HPZs a likely outcome of the federal action? 20.0

☒ No

10. Does the action include – or is it reasonably certain to cause – the use of commercial/managed bees (e.g., the use of honeybees or managed bumble bees to pollinate crops). 21.0

☒ No

11. Is there habitat for nesting, foraging, and/or overwintering for the rusty patched bumble bee in the action area? 22.0

Note: Please refer to the [ESA Section 7\(a\)\(2\) Voluntary Implementation technical assistance for Rusty Patched Bumble Bee](#) .

☒ Yes

12. Have “Project Review” surveys for rusty patched bumble bees already been conducted in the action area according to [Service-approved protocols](#)? If you don't know, answer 'no'. 24.0

☒ No

13. Does the action include collection of seed from native species?

26.0

☒ No

14. Does the action include, or will it cause the application of insecticides or fungicides?

29.0

☒ Yes

EVALUATION PROGRESS

You have reached a preliminary determination of may affect for species covered by this determination key.



COMMONWEALTH of VIRGINIA

Department of Historic Resources

2801 Kensington Avenue, Richmond, Virginia 23221

Roger W. Kirchen
Director
Tel: (804) 367-2323
www.dhr.virginia.gov

February 20, 2026

Mr. Ethan Bean
U.S. Army Corps of Engineers - Baltimore District
2 Hopkins Plaza
Baltimore, MD 21201

Re: Aquatic Plant Control Program for Water Chestnut Management
Albemarle County, Fairfax County, Fauquier County, Loudoun County, Orange County, and
Prince William County, Virginia
DHR File No. 2026-3098

Dear Mr. Bean:

The Department of Historic Resources (DHR) has received for our review and comment the Aquatic Plant Control Program for Water Chestnut Management project (DHR File No. 2026-3098) for our review and comment. Our comments are provided to the U.S Army Corps of Engineers (Corps) as assistance in meeting its responsibilities under Section 106 of the National Historic Preservation Act (NHPA). It is our understanding that the Corps is proposing water chestnut management methods to reduce the populations and spread of two species of water chestnut, *Trapa bispinosa* var. *iinumai* and *Trapa natans*, in Albemarle County, Fairfax County, Fauquier County, Loudoun County, Orange County, and Prince William County.

Architecture

Due to the low-impact characteristics of this proposed undertaking, it is DHR's opinion that the Project will have No Adverse Effects on historic architectural properties. In the event any architectural features, including but not limited to, historic district signage, piers, fencing, or headframes are proposed to be removed, DHR recommends the Corps reopen Section 106 consultation.

Archaeology

DHR understands from the submitted materials that the proposed project has the potential to impact two previously identified archaeological sites that have not yet been evaluated for the National Register of Historic Places (NRHP): Sites 44FX3674 and 44FX1782. Both sites date to the precontact period and were identified by Fairfax County Park Authority archaeologists. Although neither site has undergone systematic archaeological survey, each was reported to contain surface artifacts or features. Site 44FX3674 is also reported to extend approximately 100 feet into the artificial lake.

Eastern Region Office
2801 Kensington Avenue
Richmond, VA 23221
Tel: (804) 367-2323
Fax: (804) 367-2391

Western Region Office
962 Kime Lane
Salem, VA 24153
Tel: (540) 387-5443
Fax: (540) 387-5446

Northern Region Office
5357 Main Street
PO Box 519
Stephens City, VA 22655
Tel: (540) 868-7029
Fax: (540) 868-7033

While the proposed project primarily concerns herbicide application, some vegetation removal will occur and may involve less than one vertical foot of ground disturbance. To understand the potential effects of this work on archaeological resources, DHR requests additional information regarding the proximity of any proposed ground disturbance and construction staging areas to Sites 44FX3674 and 44FX1782.

To support this review, DHR requests project design plans that include an overlay of Sites 44FX3674 and 44FX1782, so that potential impacts to these two archaeological sites can be evaluated.

Site 44FX0112 was also identified by the Corps within the Area of Potential Effects (APE). However, because DHR previously determined this site not eligible for NRHP-listing, DHR has no additional concerns and does not require any additional information regarding this location.

Thank you for your consideration of historic resources. Please continue to consult with DHR so that we may successfully complete the Section 106 process.

Sincerely,



Chardé Reid, Archaeologist
Review and Compliance Division

Eastern Region Office
2801 Kensington Avenue
Richmond, VA 23221
Tel: (804) 367-2323
Fax: (804) 367-2391

Western Region Office
962 Kime Lane
Salem, VA 24153
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Fax: (540) 387-5446

Northern Region Office
5357 Main Street
PO Box 519
Stephens City, VA 22655
Tel: (540) 868-7029
Fax: (540) 868-7033

Seiple, Jacqueline A CIV USARMY CENAB (USA)

From: Seiple, Jacqueline A CIV USARMY CENAB (USA)
Sent: Monday, March 16, 2026 2:26 PM
To: Seiple, Jacqueline A CIV USARMY CENAB (USA)
Subject: Response to: DHR File No. 2026-3098

From: Sara Tangren <stangren@mwkog.org>
Date: Monday, March 9, 2026 at 10:34 AM
To: Seiple, Jacqueline A CIV USARMY CENAB (USA) <jacqueline.a.seiple@usace.army.mil>
Subject: FW: [EXTERNAL]Heads up! Archaeological sites / Corps Cost Share

Hi Jacqui,

Please see the email from NoVA SWCD, below.

From: Baron, Scott
Sent: Friday, March 6, 2026 9:45 AM
To: 'Sara Tangren' <stangren@mwkog.org>; Cimbale, Erin <Erin.Cimbale@fairfaxcounty.gov>
Subject: RE: [EXTERNAL]Heads up! Archaeological sites / Corps Cost Share

Sara,

Lake Martin and Burke Lake are both monitored and treated for Trapa by contract under the Northern Virginia Soil and Water Conservation District. It is performed annually from spring to fall.

Trapa is treated with Flumioxazin, a foliar herbicide.

We don't manage Trapa through manual or mechanical means. Some Trapa is sampled, which does involve pulling them. This will likely cause limited soil disturbance.

At Burke Lake Park, the contractor launches their boat at the marina.

At Lake Martin, the contractor launches their boat from the shoreline near the driveway for 3133 Trenholm Drive, Oakton. The coordinates for this spot are approximately 38.884133, -77.336404.

Trapa likes shallow water so it tends to occur along the edge of a waterbody.

I know that our contractors have used jon boats on at least some of the lakes and ponds in our program. I assume that it includes Lake Martin and Burke Lake but I am not sure.

Let me know whether I've adequately answered your questions. Basically, disturbance to the land and water along the shore is minimal under normal circumstances.

Scott Baron (he/him/his)
Urban Conservation Specialist II

Northern Virginia Soil and Water Conservation District
12055 Government Center Parkway, Suite 905
Fairfax, VA 22035-5512
scott.baron@fairfaxcounty.gov
703 481 4026 (office)

Chesapeake Bay Landscape Professional, level 1
Certification number 6-00146

Virginia Nutrient Management Planner, Turf and Landscape
Certificate number 819

I can best be reached via email.

From: Sara Tangren <stangren@mwkog.org>
Sent: Wednesday, March 4, 2026 2:45 PM
To: Cimbal, Erin <Erin.Cimbal@fairfaxcounty.gov>; Baron, Scott <Scott.Baron@fairfaxcounty.gov>
Subject: [EXTERNAL]Heads up! Archaeological sites / Corps Cost Share

CAUTION: THIS EMAIL ORIGINATED FROM OUTSIDE OF FAIRFAX COUNTY GOVERNMENT. Do not click links or open attachments unless you recognize the sender and know the content is safe!

Hi Scott and Erin,

I wanted to reach out to ensure we are well-prepared for our interactions with the Virginia Department of Historical Resources regarding the two sites listed below:

BURL-VA = Burke Lake, 38.76095 -77.30139, waterbody managed by VA DWR, land managed by Fairfax Parks Authority, trapa management contracted through Northern Virginia Soil & Water Conservation District.
MARL-VA = Lake Martin, 38.88477 -77.33928, privately owned with trapa management handled by Fairfax County DPW.

While we are still awaiting more precise information about the archaeological locations, which appear to be situated along the shoreline or possibly extending into the lake, I wanted to proactively inform you so as to minimize approval delays.

DHR has requested clarification on two key points (their letter is attached):

- Will trapa plants be managed using herbicides or manual removal?
- What specific activities are planned for the shore, and where will these occur?

Our primary goal is to assure DHR that our management activities will not disturb the soil profile. Any actions such as manual plant removal, walking in waders, or dragging boats could potentially impact buried artifacts or archaeological features. The Corps has asked DHR to provide the exact locations of archaeological concern so that we can be more specific in our responses. If DHR agrees to share these with us, I will promptly pass the information on to you.

To streamline this process, it might be helpful if you could send an email describing your contractor's trapa control methods. If the approach involves applying herbicides from a shallow-bottomed boat and limiting shore activities to existing paved boat ramps or parking lots, this should satisfy DHR's concerns regardless of the precise locations of the archaeological zones.

Please let me know if you have questions or need further details!

Best,
Sara

Sara Tangren, Ph.D.

Program Coordinator, NatCap PRISM

Metropolitan Washington Council of Governments

Watch here: [Is it difficult to paddle through a two-horned trapa infestation?](#)

<https://www.youtube.com/watch?app=desktop&>



Seiple, Jacqueline A CIV USARMY CENAB (USA)

From: Seiple, Jacqueline A CIV USARMY CENAB (USA)
Sent: Monday, March 16, 2026 2:15 PM
To: Seiple, Jacqueline A CIV USARMY CENAB (USA)
Subject: FW: Aquatic Plant Control Program for Water Chestnut Management (DHR File No. 2026-3098) | e-Mail #05107

From: Charde Reid <Charde.Reid@dhr.virginia.gov>
Sent: Monday, March 16, 2026 10:59 AM
To: Bean, Ethan A CIV USARMY CENAB (USA) <ETHAN.A.BEAN@usace.army.mil>
Subject: [Non-DoD Source] Aquatic Plant Control Program for Water Chestnut Management (DHR File No. 2026-3098) | e-Mail #05107

Dear Mr. Bean,

Thank you for requesting comments from the Department of Historic Resources (DHR) on the referenced project. DHR appreciates the additional information provided and understands that only herbicide application and no vegetation removal will take place within previously identified sites 44FX3674 and 44FX1782. Based upon the documentation provided, it is our opinion that the historic properties within the Area of Potential Effects will not be adversely affected by the proposed undertaking.

Implementation of the undertaking in accordance with the finding of *No Adverse Effect* as documented fulfills the Federal agency's responsibilities under Section 106 of the National Historic Preservation Act. If the scope of the undertaking changes or if the undertaking cannot be completed as proposed in the application submitted and reviewed by DHR, please contact our office for guidance on reinitiating consultation under Section 106.

If you have any questions or require any further assistance, please contact me.

Sincerely,

Chardé Reid

Department of Historic Resources
Review and Compliance Division
Phone: 804-309-3111
Charde.Reid@dhr.virginia.gov

▪

From: [Stanhope, Jennifer W](#)
To: [May, Kristina K CIV USARMY CENAB \(USA\)](#)
Cc: [Virginia Field Office, FW5](#)
Subject: [Non-DoD Source] RE: [EXTERNAL] Water Chestnut Management in Maryland, Washington, D.C., and Virginia-Self Certification Letter
Date: Monday, February 9, 2026 1:41:24 PM
Attachments: [image001.png](#)
[image002.png](#)

Kristina,

Thank you for sharing the shapefile.

For Virginia, we have no comments or additional questions. The self-certification letter for Virginia you provided is fine.

I believe CBFO may have comments; please coordinate with their office directly.

cbfoprojectreview@fws.gov

Thank you,

Jen

Jennifer Stanhope
Fish and Wildlife Biologist
U.S. Fish and Wildlife Service - Virginia Field Office
6669 Short Lane
Gloucester, VA 23061
Office: 804-905-9781
<https://www.fws.gov/office/virginia-ecological-services>



From: May, Kristina K CIV USARMY CENAB (USA) <Kristina.K.May@usace.army.mil>
Sent: Monday, February 9, 2026 12:29 PM
To: Stanhope, Jennifer W <jennifer_stanhope@fws.gov>
Subject: RE: [EXTERNAL] Water Chestnut Management in Maryland, Washington, D.C., and Virginia-Self Certification Letter

Jennifer,

Please see the shapefile attached.

Thanks,
Kristina May
Biologist, Planning Division
U.S. Army Corps of Engineers, Baltimore District
2 Hopkins Plaza, Baltimore, MD 21201
Cube 10-E-10
Email: kristina.k.may@usace.army.mil
BUILDING STRONG®



From: Stanhope, Jennifer W <jennifer_stanhope@fws.gov>
Sent: Monday, February 9, 2026 11:44 AM
To: May, Kristina K CIV USARMY CENAB (USA) <Kristina.K.May@usace.army.mil>
Subject: [Non-DoD Source] RE: [EXTERNAL] Water Chestnut Management in Maryland, Washington, D.C., and Virginia-Self Certification Letter

Dear Kristina,

I'm reviewing the reference project. Thank you for submitting this. Would you be able to provide the shapefile for the 2026 project locations? There apparently was a glitch in the dkey when it looked at VA and MD so I wanted to verify that there is a no effect for green floater and any other mussels.

Thank you.

Jen

Jennifer Stanhope
Fish and Wildlife Biologist
U.S. Fish and Wildlife Service - Virginia Field Office
6669 Short Lane
Gloucester, VA 23061
Office: 804-905-9781
<https://www.fws.gov/office/virginia-ecological-services>



From: May, Kristina K CIV USARMY CENAB (USA) <Kristina.K.May@usace.army.mil>
Sent: Wednesday, January 14, 2026 2:26 PM
To: Virginia Field Office, FW5 <virginiafieldoffice@fws.gov>
Cc: Deeley, Sabrina M <sabrina_deeley@fws.gov>; Seiple, Jacqueline A CIV USARMY CENAB (USA) <Jacqueline.A.Seiple@usace.army.mil>; Chandler, Joseph W CIV USARMY CENAB (USA) <Joseph.W.Chandler@usace.army.mil>
Subject: [EXTERNAL] Water Chestnut Management in Maryland, Washington, D.C., and Virginia-Self Certification Letter

This email has been received from outside of DOI - Use caution before clicking on links, opening attachments, or responding.

To whom it may concern:

Please see the attached self-certification letter and review package for the Federal Participation in the Aquatic Plant Control Program for Water Chestnut Management in Maryland, Washington, D.C., and Virginia.

Please contact me if you have any questions.

Thanks,
Kristina May
Biologist, Planning Division
U.S. Army Corps of Engineers, Baltimore District
2 Hopkins Plaza, Baltimore, MD 21201
Cube 10-E-10
Email: kristina.k.may@usace.army.mil
BUILDING STRONG®

From: [Katharine McCarthy](#)
To: [May, Kristina K CIV USARMY CENAB \(USA\)](#)
Cc: [Seiple, Jacqueline A CIV USARMY CENAB \(USA\)](#); [Lori Byrne -DNR-](#)
Subject: [Non-DoD Source] Re: FW: [EXTERNAL] RE: Water Chestnut Management in Maryland, Washington, D.C., and Virginia-Self Certification Letter
Date: Thursday, February 19, 2026 4:04:58 PM
Attachments: [image001.png](#)
[image002.png](#)

Hi Kristina,
The Natural Heritage Program has no records for Puritan tiger beetle or any other state rare, threatened or endangered species within this tidal pond.
Thank you for consulting with us.
Kathy

On Wed, Feb 18, 2026 at 9:47 AM May, Kristina K CIV USARMY CENAB (USA) <Kristina.K.May@usace.army.mil> wrote:

Hi Kathy,

I have been coordinating with Raquel Wetzell at USFWS on a project we are working on to remove water chestnut from various waterbodies in Maryland and Virginia. Raquel wanted me to check with you to confirm that removal of water chestnut from a tidal pond adjacent to the Sassafras River labeled as 'Ponds Bar' would have no effect on the Puritan tiger beetle (see screenshot below). Please let me know if you need any additional information.

Thanks,

Kristina May

Biologist, Planning Division

U.S. Army Corps of Engineers, Baltimore District

2 Hopkins Plaza, Baltimore, MD 21201

Cube 10-E-10

Email: kristina.k.may@usace.army.mil

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From: CBFO Project Review, FW5 <cbfoprojectreview@fws.gov>

Sent: Wednesday, February 18, 2026 8:35 AM

To: May, Kristina K CIV USARMY CENAB (USA) <Kristina.K.May@usace.army.mil>

Cc: Deeley, Sabrina M <sabrina_deeley@fws.gov>; Seiple, Jacqueline A CIV USARMY CENAB (USA) <Jacqueline.A.Seiple@usace.army.mil>

Subject: [Non-DoD Source] Re: [EXTERNAL] RE: Water Chestnut Management in Maryland, Washington, D.C., and Virginia-Self Certification Letter

Hi Kristina,

In the limited area shown on your image, you should be outside the Puritan Tiger Beetle buffer and there should be no effect on the species. I would confirm with Kathy McCarthy at Maryland Department of Natural Resources (katharine.mccarthy@maryland.gov). Otherwise, I have no additional comments.

Thanks!

Raquel Wetzell

US Fish and Wildlife Service

Chesapeake Bay Field Office

177 Admiral Cochrane Dr.

Annapolis, MD 21401

From: May, Kristina K CIV USARMY CENAB (USA) <Kristina.K.May@usace.army.mil>

Sent: Wednesday, February 18, 2026 8:15 AM

To: CBFO Project Review, FW5 <cbfoprojectreview@fws.gov>

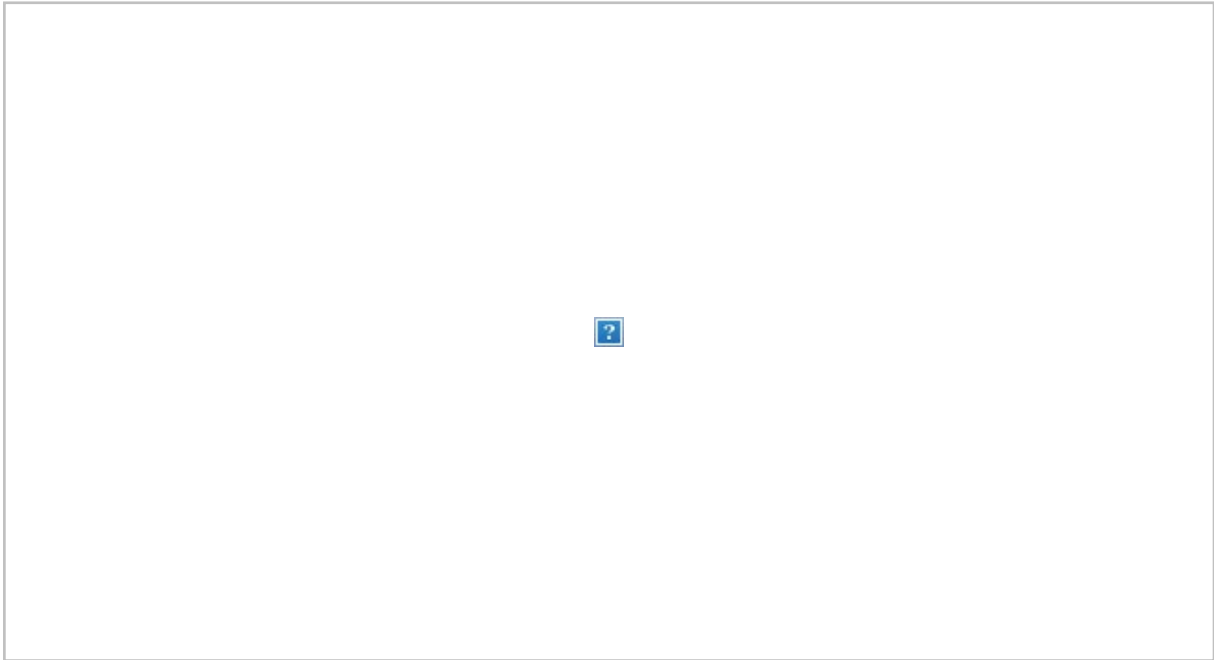
Cc: Deeley, Sabrina M <sabrina_deeley@fws.gov>; Seiple, Jacqueline A CIV USARMY CENAB (USA) <Jacqueline.A.Seiple@usace.army.mil>

Subject: [EXTERNAL] RE: Water Chestnut Management in Maryland, Washington, D.C., and Virginia-Self Certification Letter

This email has been received from outside of DOI - Use caution before clicking on links, opening attachments, or responding.

Hi Raquel,

See a screenshot of the location below. *Trapa natans* is in a tidal pond adjacent to the Sassafras River labeled as Ponds Bar. Let us know if there will be any issues with the tiger beetles in that location.



Thanks,

Kristina May

Biologist, Planning Division

U.S. Army Corps of Engineers, Baltimore District

2 Hopkins Plaza, Baltimore, MD 21201

Cube 10-E-10

Email: kristina.k.may@usace.army.mil

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From: CBFO Project Review, FW5 <cbfoprojectreview@fws.gov>
Sent: Wednesday, February 11, 2026 9:16 AM
To: May, Kristina K CIV USARMY CENAB (USA) <Kristina.K.May@usace.army.mil>
Cc: Deeley, Sabrina M <sabrina_deeley@fws.gov>; Virginia Field Office, FW5 <virginiafieldoffice@fws.gov>
Subject: [Non-DoD Source] Re: Water Chestnut Management in Maryland, Washington, D.C., and Virginia-Self Certification Letter

Hello Kristin,

CBFO has received your review package for the Federal Participation in the Aquatic Plant Control Program for Water Chestnut Management in Maryland, Washington, D.C., and Virginia. Upon reviewing your Maryland locations, we noticed one site between Cheshaven and Kentmore Park that was of interest (attached - according to your Table 2, I believe this is Chester-Sassafras (02060002) Cecil County, MD). This site is located right outside the shoreline buffer for Puritan Tiger beetle, which is listed as threatened under the ESA. I wanted to confirm that the action area drawn for this site is accurate and that the project does not intend for any activities on the shoreline (in-channel work is fine).

Thanks,

Raquel Wetzell

US Fish and Wildlife Service

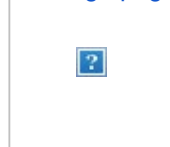
Chesapeake Bay Field Office

177 Admiral Cochrane Dr.

Annapolis, MD 21401

--

MD Logo.png



dnr.maryland.gov

Katharine A. McCarthy
Southern Region Ecologist
Natural Heritage Program
Wildlife and Heritage Service
Department of Natural Resources
580 Taylor Avenue, E-1
Annapolis, MD 21401
[410-260-8569](tel:410-260-8569) (office)
410-260-8596 (fax)
katharine.mccarthy@maryland.gov



[Website](#) | [Facebook](#) | [Twitter](#)



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Assistant Regional Director-Ecological Services
5600 American Blvd. West
Bloomington, MN 55437-1458
Phone: (612) 713-5350 Fax: (612) 713-5292



In Reply Refer To:

02/12/2026 15:10:23 UTC

Project code: 2026-0030202

Project Name: Aquatic Plant Control Program for Water Chestnut Management - Programmatic, MD, VA, DC

Federal Nexus: yes

Federal Action Agency (if applicable): Army Corps of Engineers

Subject: Concurrence letter for 'Aquatic Plant Control Program for Water Chestnut Management - Programmatic, MD, VA, DC' for rusty patched bumble bee that may occur in your proposed project location consistent with the Rusty Patched Bumble Bee Range Wide Determination Key (RPBB DKey).

Dear Kristina May:

This letter records your determination using the RPBB DKey within the Information for Planning and Consultation (IPaC) system provided to the U.S. Fish and Wildlife Service (USFWS) on **February 12, 2026**, for 'Aquatic Plant Control Program for Water Chestnut Management - Programmatic, MD, VA, DC' (here forward, Project). This project has been assigned Project Code '2026-0030202' and all future correspondence should clearly reference this number. **Please carefully review this letter. Your Endangered Species Act (Act) requirements are not complete.**

Ensuring Accurate Determinations When Using IPaC Determination Keys

The USFWS developed the IPaC system and associated species' determination keys in accordance with the Endangered Species Act of 1973 (ESA; 87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.). All information submitted by the Project proponent into the IPaC must accurately represent the full scope and details of the Project. **Failure to accurately represent or implement the Project as detailed in IPaC or the RPBB DKey, invalidates this letter.**

Determination for the Rusty Patched Bumble Bee

Based on your answers and the assistance of the USFWS' RPBB DKey, you made the following effect determination for the proposed Action:

Species	Listing Status	Determination
---------	----------------	---------------

Rusty Patched Bumble Bee (*Bombus affinis*)

Endangered

NLAA

The proposed Action may affect but is not likely to adversely affect (NLAA) rusty patched bumble bee. The Service will notify you within 30 calendar days if we determine that this proposed Action does not meet the criteria for a NLAA determination for rusty patched bumble bee. If we do not notify you within that timeframe, you may proceed with the Action under the terms of the NLAA concurrence provided here and pending your review of effects to other federally listed species.

Other Species and Critical Habitat that May be Present in the Action Area

The IPaC-assisted determination key for the rusty patched bumble bee **does not** apply to the following ESA-protected species and/or critical habitat that also may occur in your Action area:

- Appalachian Monkeyface (pearlymussel) *Theliderma sparsa* Endangered
- Atlantic Pigtoe *Fusconaia masoni* Threatened
- Bermuda Petrel *Pterodroma cahow* Endangered
- Big Sandy Crayfish *Cambarus callainus* Threatened
- Birdwing Pearlymussel *Lemiox rimosus* Endangered
- Blackside Dace *Phoxinus cumberlandensis* Threatened
- Bog Turtle *Glyptemys muhlenbergii* Threatened
- Candy Darter *Etheostoma osburni* Endangered
- Carolina Northern Flying Squirrel *Glaucomys sabrinus coloratus* Endangered
- Cracking Pearlymussel *Hemistena lata* Endangered
- Cumberland Moccasinshell *Medionidus conradicus* Proposed Endangered
- Cumberland Monkeyface (pearlymussel) *Theliderma intermedia* Endangered
- Cumberlandian Combshell *Epioblasma brevidens* Endangered
- Dromedary Pearlymussel *Dromus dromas* Endangered
- Duskytail Darter *Etheostoma percnurum* Endangered
- Dwarf Wedgemussel *Alasmidonta heterodon* Endangered
- Eastern Black Rail *Laterallus jamaicensis jamaicensis* Threatened
- Eastern Hellbender *Cryptobranchus alleganiensis alleganiensis* Proposed Endangered
- Eastern Prairie Fringed Orchid *Platanthera leucophaea* Threatened
- Fanshell *Cyprogenia stegaria* Endangered
- Finerayed Pigtoe *Fusconaia cuneolus* Endangered
- Flat-spined Three-toothed Snail *Triodopsis platysayoides* Threatened
- Fluted Kidneyshell *Ptychobrachus subtentus* Endangered
- Gray Bat *Myotis grisescens* Endangered
- Green Floater *Lasmigona subviridis* Proposed Threatened

- Green Sea Turtle *Chelonia mydas* Threatened
- Harperella *Ptilimnium nodosum* Endangered
- Hawksbill Sea Turtle *Eretmochelys imbricata* Endangered
- Hay's Spring Amphipod *Stygobromus hayi* Endangered
- Indiana Bat *Myotis sodalis* Endangered
- James Spinemussel *Parvaspina collina* Endangered
- Kemp's Ridley Sea Turtle *Lepidochelys kempii* Endangered
- Leatherback Sea Turtle *Dermochelys coriacea* Endangered
- Lee County Cave Isopod *Lirceus usdagalun* Endangered
- Loggerhead Sea Turtle *Caretta caretta* Threatened
- Longsolid *Fusconaia subrotunda* Threatened
- Madison Cave Isopod *Antrolana lira* Threatened
- Maryland Darter *Etheostoma sellare* Endangered
- Michaux's Sumac *Rhus michauxii* Endangered
- Mitchell's Satyr Butterfly *Neonympha mitchellii mitchellii* Endangered
- Monarch Butterfly *Danaus plexippus* Proposed Threatened
- Northeastern Beach Tiger Beetle *Habroscelimorpha dorsalis dorsalis* Threatened
- Northeastern Bulrush *Scirpus ancistrochaetus* Endangered
- Northern Long-eared Bat *Myotis septentrionalis* Endangered
- Oyster Mussel *Epioblasma capsaeformis* Endangered
- Peter's Mountain Mallow *Iliamna corei* Endangered
- Pink Mucket (pearlymussel) *Lampsilis abrupta* Endangered
- Piping Plover *Charadrius melodus* Threatened
- Puritan Tiger Beetle *Ellipsoptera puritana* Threatened
- Purple Bean *Villosa perpurpurea* Endangered
- Red-cockaded Woodpecker *Dryobates borealis* Threatened
- Roan Mountain Bluet *Hedyotis purpurea* var. *montana* Endangered
- Rock Gnome Lichen *Gymnoderma lineare* Endangered
- Roseate Tern *Sterna dougallii dougallii* Endangered
- Rough Pigtoe *Pleurobema plenum* Endangered
- Rough Rabbitsfoot *Quadrula cylindrica strigillata* Endangered
- Rufa Red Knot *Calidris canutus rufa* Threatened
- Salamander Mussel *Simpsonaias ambigua* Proposed Endangered
- Sandplain Gerardia *Agalinis acuta* Endangered
- Seabeach Amaranth *Amaranthus pumilus* Threatened
- Sensitive Joint-vetch *Aeschynomene virginica* Threatened

- Shale Barren Rock Cress *Boechera serotina* Endangered
- Sheepnose Mussel *Plethobasus cyphyus* Endangered
- Shenandoah Salamander *Plethodon shenandoah* Endangered
- Shiny Pigtoe *Fusconaia cor* Endangered
- Sickie Darter *Percina williamsi* Threatened
- Slabside Pearlymussel *Pleuroaia dolabelloides* Endangered
- Slender Chub *Erimystax cahni* Threatened
- Small Whorled Pogonia *Isotria medeoloides* Threatened
- Small-anthered Bittercress *Cardamine micranthera* Endangered
- Smooth Coneflower *Echinacea laevigata* Threatened
- Snuffbox Mussel *Epioblasma triquetra* Endangered
- Spectaclecase (mussel) *Cumberlandia monodonta* Endangered
- Spotfin Chub *Erimonax monachus* Threatened
- Spreading Avens *Geum radiatum* Endangered
- Spruce-fir Moss Spider *Microhexura montivaga* Endangered
- Swamp Pink *Helonias bullata* Threatened
- Tan Riffleshell *Epioblasma florentina walkeri* (= *E. walkeri*) Endangered
- Tennessee Clubshell *Pleurobema oviforme* Proposed Endangered
- Tennessee Pigtoe *Pleuroaia barnesiana* Proposed Endangered
- Tricolored Bat *Perimyotis subflavus* Proposed Endangered
- Virginia Big-eared Bat *Corynorhinus* (= *Plecotus*) *townsendii virginianus* Endangered
- Virginia Fringed Mountain Snail *Polygyriscus virginianus* Endangered
- Virginia Round-leaf Birch *Betula uber* Threatened
- Virginia Sneezeweed *Helenium virginicum* Threatened
- Virginia Spiraea *Spiraea virginiana* Threatened
- Whorled Sunflower *Helianthus verticillatus* Endangered
- Yellow Lance *Elliptio lanceolata* Threatened
- Yellowfin Madtom *Noturus flavipinnis* Experimental Population, Non-Essential
U.S.A. (TN, VA-specified portions of the Holston River and watershed; see 17.84(e)(1)(i))
- Yellowfin Madtom *Noturus flavipinnis* Threatened
Wherever found, except where listed as an experimental population

Critical Habitats:

- Atlantic Pigtoe *Fusconaia masoni* Threatened
- Candy Darter *Etheostoma osburni* Endangered
- Cumberlandian Combshell *Epioblasma brevidens* Endangered

- Fluted Kidneyshell *Ptychobranhus subtentus* Endangered
- Green Floater *Lasmigona subviridis* Proposed Threatened
- Longsolid *Fusconaia subrotunda* Threatened
- Maryland Darter *Etheostoma sellare* Endangered
- Oyster Mussel *Epioblasma capsaeformis* Endangered
- Purple Bean *Villosa perpurpurea* Endangered
- Rough Rabbitsfoot *Quadrula cylindrica strigillata* Endangered
- Sheepnose Mussel *Plethobasus cyphus* Endangered
- Sickie Darter *Percina williamsi* Threatened
- Slabside Pearlymussel *Pleuronaia dolabelloides* Endangered
- Slender Chub *Erimystax cahni* Threatened
- Snuffbox Mussel *Epioblasma triquetra* Endangered
- Spectaclecase (mussel) *Cumberlandia monodonta* Endangered
- Spotfin Chub *Erimonax monachus* Threatened
- Yellow Lance *Elliptio lanceolata* Threatened
- Yellowfin Madtom *Noturus flavipinnis* Threatened

Coordination with the USFWS is advised for any species and/or critical habitat listed above.

You should coordinate with our Office to determine whether the Action may affect the species and/or critical habitat listed above and if further consultation is required. Note that reinitiation of consultation would be necessary if a new species is listed or critical habitat designated that may be affected by the identified action before it is complete.

If you have any questions regarding this letter or need further assistance, please contact the local Ecological Services Field Office and reference Project Code '2026-0030202' associated with this Project. See the top of this letter for the Project Code.

Additional Information

Sufficient project details: Please provide sufficient project details on your project homepage in IPaC (Define Project, Project Description) to support your conclusions. Failure to disclose important aspects of your project that would influence the outcome of your effects determinations may negate your determinations and invalidate this letter. If you have site-specific information that leads you to believe a different determination is more appropriate for your project than what the Dkey concludes, you can and should proceed based on the best available information.

Future project changes: The Service recommends that you contact the local Ecological Services Field Office or re-evaluate the project in IPaC if: 1) the scope or location of the proposed Action is changed; 2) new information reveals that the action may affect rusty patched bumble bee in a manner or to an extent not previously considered; 3) the Action is modified in a manner that causes effects to rusty patched bumble bee; or 4) or critical habitat is designated. If any of the

above conditions occur, additional consultation with the Service should take place before project changes are final or resources are committed.

Species-specific information

Bald and Golden Eagles: Bald eagles, golden eagles, and their nests are protected under the Bald and Golden Eagle Protection Act (54 Stat. 250, as amended, 16 U.S.C. 668a-d) (Eagle Act). The Eagle Act prohibits, except when authorized by an Eagle Act permit, the “taking” of bald and golden eagles and defines “take” as “pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb.” The Eagle Act’s implementing regulations define disturb as “... to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, (1) injury to an eagle, (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior.”

If you observe a bald eagle nest in the vicinity of your proposed project, you should follow the National Bald Eagle Management Guidelines (May 2007). For more information on eagles and conducting activities in the vicinity of an eagle nest, please visit our regional eagle website or contact the local Ecological Services Field Office. If the Action may affect bald or golden eagles, additional coordination with the Service under the Eagle Act may be required.

Action Description

You provided to IPaC the following name and description for the subject Action.

1. Name

Aquatic Plant Control Program for Water Chestnut Management - Programmatic, MD, VA, DC

2. Description

The following description was provided for the project 'Aquatic Plant Control Program for Water Chestnut Management - Programmatic, MD, VA, DC':

Includes a suite of management methods that could be used alone or in combination to reduce the populations and spread of these two species of water chestnut, and to enable rapid response to new infestations. Management methods included in the preferred alternative include:

- Manual removal of water chestnut by hand-pulling localized populations of plants, accessed by wading or small boats.
- Mechanical management of water chestnut through the use of mechanical harvesters, such as cutters or hydro-rakes. This method includes cutting, pulling, or tilling to eliminate unwanted vegetation. Mechanical harvesting is most effective in densely invaded areas (>25% water chestnut surface area coverage), where plants are growing in mats.
- Chemical treatment of water chestnut with herbicides registered and licensed for aquatic use by the U.S. Environmental Protection Agency and covered by General Permits for aquatic pesticide use in Maryland, Virginia, and Washington D.C. Herbicides used for treatment will primarily include imazamox, flumioxazin, 2,4-D, trichlopyr, and fluridone; although other licensed herbicides proven effective for water chestnut treatment could be used in future management efforts.

The approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@38.2229098,-77.74126012654976,14z>



QUALIFICATION INTERVIEW

1. Is the action authorized, funded, or being carried out by a Federal agency?

Yes

2. Are you the Federal agency or designated non-federal representative?

Yes

3. Does the action area overlap with a rusty patched bumble bee high potential zone?

Automatically answered

Yes

4. Does the action include - or is it reasonably certain to cause - intentional take of rusty patched bumble bee (rusty patched bumble bee) that is not covered under a scientific recovery permit under section 10(A)1(a) of the Endangered Species Act or under a cooperative agreement with a state agency?

Note: This could include, for example, surveys or studies that include handling or capture of the species. Whether "Project Review" surveys using USFWS protocols were conducted as part of the action is addressed later in this key.

No

5. Will the action be authorized, funded, or carried out by the U.S. Forest Service for implementation on the Monongahela, George Washington, or Jefferson National Forest?

No

6. Does the action include – or is it reasonably certain to result in – construction of one or more new roads or rail lines that will result in vehicle traffic speeds at 45mph or higher in a rusty patched bumble bee HPZ? For example, answer NO if the project will construct a low speed (< 30 mph) road (Such as Forest Service Road Maintenance Levels 1 -3 (refer to <https://www.fs.usda.gov/eng/pubs/pdf/05771205.pdf>)).

No

7. Does the action include – or is it reasonably certain to result in – the addition of one or more travel lanes that are likely to increase vehicle speeds to at least 45mph on one or more existing roads in a rusty patched bumble bee HPZ? For example, answer NO if considering a travel lane addition that maintains road with low speeds (< 30 mph).

No

8. Is an increase in vehicular traffic speeds to over 45mph to an existing road in one or more HPZs a likely outcome of the federal action? For example, answer NO if the federal action will increase if traffic speeds would stay relatively low (e.g., 30 mph).

No

9. Does the action include – or is it reasonably certain to cause – the use of commercial/ managed bees (e.g., the use of honeybees or managed bumble bees to pollinate crops).

No

10. Is there habitat for nesting, foraging, and/or overwintering for the rusty patched bumble bee in the action area?

Note: Please refer to the [ESA Section 7\(a\)\(2\) Voluntary Implementation technical assistance for Rusty Patched Bumble Bee](#).

Yes

11. Have “Project Review” surveys for rusty patched bumble bees already been conducted in the action area according to [Service-approved protocols](#)? If you don't know, answer 'no'.

No

12. Does the action include collection of seed from native species?

No

13. Does the action include, or will it cause the application of insecticides or fungicides?

No

14. Does the action include, or will it cause activities to control native rodent species?

No

15. Does the action include, or will it cause planting or seeding of non-native plant species?

No

16. Will the action include or cause herbicide use?

Yes

17. Will herbicide application methods include only wiping individual plants with a wick or glove, cut-stump, spot-spraying, or basal bark treatments?

No

18. Will herbicides be applied when the rusty patched bumble bee is likely to be foraging on the affected plants in a manner that could result in direct exposure of individuals to the herbicide mixture?

No

19. Will the action cause an increase in the extent or duration of surface flooding or soil saturation in rusty patched bumble bee overwintering or nesting habitat in a High Potential Zone?

Note: This may occur, for example, as a result of activities or structures that impound water, otherwise alter or interrupt existing drainage patterns, or that affect surface runoff.

No

20. Will the action cause ground disturbance in rusty patched bumble bee habitat within a High Potential Zone?

No

21. Will the action include or cause effects to native vegetation in rusty patched bumble bee habitat?

No

IPAC USER CONTACT INFORMATION

Agency: Army Corps of Engineers
Name: Kristina May
Address: 2 Hopkins Plaza
Address Line 2: Planning Division
City: Baltimore
State: MD
Zip: 21201
Email: kristina.k.may@usace.army.mil
Phone: 4109626100

**Aquatic Plant Control Program for Water Chestnut Management in
Maryland, Washington, D.C., and Virginia
Programmatic Environmental Assessment**

APPENDIX C – CHEMICAL PRODUCT LABELS

GROUP 14 HERBICIDE

Clipper® SC

AQUATIC HERBICIDE

**FOR THE MANAGEMENT OF UNDESIRABLE AQUATIC VEGETATION
IN SLOW MOVING OR QUIESCENT WATERS**

ACTIVE INGREDIENT:

Flumioxazin* 44.0%

OTHER INGREDIENTS: 56.0%

TOTAL: 100.0%

*2-[7-fluoro-3,4-dihydro-3-oxo-4-(2-propynyl)-2H-1,4-benzoxazin-6-yl]-4,5,6,7-tetrahydro-1H-isoindole-1,3(2H)-dione
Clipper SC contains 4 pounds flumioxazin per gallon.

Shake Well Before Use

KEEP OUT OF REACH OF CHILDREN

**Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle.
(If you do not understand the label, find someone to explain it to you in detail.)**

SEE INSIDE BOOKLET FOR ADDITIONAL PRECAUTIONARY STATEMENTS

For Chemical Spill, Leak, Fire,
or Exposure, Call CHEMTREC
(800) 424-9300
For Medical Emergencies Only,
Call (877) 325-1840

EPA REG. NO. 71368-114

Manufactured for
Nufarm Inc.
11901 S. Austin Ave.
Alsip, IL 60803



Grow a better tomorrow.

PRECAUTIONARY STATEMENTS HAZARDS TO HUMANS AND DOMESTIC ANIMALS

Harmful if inhaled or absorbed through the skin. Causes moderate eye irritation. Avoid breathing spray mist. Avoid contact with skin, eyes or clothing.

HOT LINE NUMBER

Have the product container or label with you when calling a poison control center or doctor, or going for treatment.

You may also contact 1-877-325-1840 for emergency medical treatment information.

PERSONAL PROTECTIVE EQUIPMENT (PPE):

Some of the materials that are chemical-resistant to this product are listed below.

Applicators and other handlers must wear: long-sleeved shirt and long pants, chemical-resistant gloves made of any waterproof material such as polyethylene or polyvinyl chloride, shoes and socks.

Follow manufacturer's instructions for cleaning/maintaining PPE. If there are no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

USER SAFETY RECOMMENDATIONS

Users Should:

- Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.
- Remove clothing/PPE immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
- Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

ENVIRONMENTAL HAZARDS

This product can be toxic to non-target plants and aquatic invertebrates. Do not apply to water except as specified on the label. Drift and runoff may be hazardous to non-target plants and aquatic organisms in neighboring areas, if not used in accordance to label directions. Do not apply where runoff is likely to occur. Do not apply when weather conditions favor drift from treated areas. Do not contaminate water when disposing of equipment washwaters.

This pesticide is toxic to plants and should be used strictly in accordance with the drift and run-off precautions on this label in order to minimize off-site exposures.

PHYSICAL OR CHEMICAL HAZARDS

Do not mix or allow coming in contact with oxidizing agent. Hazardous chemical reaction may occur.

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

Read the entire label before using this product. Use strictly in accordance with label precautionary statements and directions, and with applicable state and federal regulations.

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your State or Tribe, consult the agency responsible for pesticide regulation.

RISKS OF USING THIS PRODUCT

The Buyer and User (referred to collectively herein as "Buyer") of this product should be aware that there are inherent unintended risks associated with the use of this product which are impossible to eliminate. These risks include, but are not limited to, injury to plants and crops to which this product is applied, lack of control of the target pests or weeds, resistance of the target pest or weeds to this product, injury caused by drift, and injury to rotational crops caused by carryover in the soil. Such risks of crop injury, non-performance, resistance or other unintended consequences are unavoidable and may result because of such factors as weather, soil conditions, disease, moisture conditions, irrigation practices, condition of the crop at the time of application, presence of other materials either applied in the tank mix with this product or prior to application of this product, cultural practices or the manner of use or application, (or a combination of such factors) all of which are factors beyond the control of Nufarm. The Buyer should be aware that these inherent unintended risks may reduce the harvested yield of the crop in all or a portion of the treated acreage, or otherwise affect the crop such that additional care, treatment and expense are required to take the crop to harvest. If the Buyer chooses not to accept these risks, THEN THIS PRODUCT SHOULD NOT BE APPLIED. By applying this product Buyer acknowledges and accepts these inherent unintended risks AND TO THE FULLEST EXTENT ALLOWED BY LAW, AGREES THAT ALL SUCH RISKS ASSOCIATED WITH THE APPLICATION AND USE ARE ASSUMED BY THE BUYER.

Nufarm shall not be responsible for losses or damages (including, but not limited to, loss of yield, increased expenses of farming the crop or such incidental, consequential or special damages that may be claimed) resulting from use of this product in any manner not set forth on the label. Buyer assumes all risks associated with the use of this product in any manner or under conditions not specifically directed or approved on the label.

See also **WARRANTY DISCLAIMER** and **LIMITATION OF LIABILITY** sections of the label for additional information.

RESISTANCE MANAGEMENT

This product is a Group 14 herbicide. Any weed population may contain or develop plants naturally resistant to this product and other Group 14 herbicides. Weed species with acquired resistance to Group 14 herbicides may eventually dominate the weed population if Group 14 herbicides are used repeatedly in the same field or in successive years as the primary method of control for targeted species. This may result in partial or total loss of control of those species by this product or other Group 14 herbicides.

To delay herbicide resistance consider:

- Avoiding the consecutive use of this product or other target site of action Group 14 herbicides that might have a similar target site of action, on the same weed species.
- Using tank mixtures or premixes with herbicides from different target site of action Groups as long as the involved products are all registered for the same use, have different sites of action and are both effective at the tank mix or prepack rate on the weed(s) of concern.
- Basing herbicide use on a comprehensive Integrated Pest Management (IPM) program.
- Monitoring treated weed populations for loss of field efficacy.
- Contacting your local extension specialist, certified crop advisors and/or manufacturer for herbicide resistance management and/or integrated weed management recommendations for specific crops and resistant weed biotypes.

For further information or to report suspected resistance, you may contact Nufarm at (800) 345-3330.

TANK MIXES

NOTICE: Tank mixing or use of this product with any other product which is not specifically and expressly authorized by the label shall be the exclusive risk of user, applicator and/or application advisor, to the extent allowed by applicable law.

Read and follow the entire label of each product to be used in the tank mix with this product.

PRODUCT INFORMATION

This product is a fast acting contact herbicide that controls selected submersed, emergent, and floating aquatic weeds. It is most effective when applied to young, actively growing weeds in water with a pH of less than 8.5.

This product may be applied to the following quiescent or slow moving bodies of water:

- Bayous
- Canals
- Drainage ditches
- Lakes
- Marshes
- Ponds (including golf course ponds)
- Reservoirs

Application of this product to public aquatic areas may require special approval and/or permits. Consult with local state agencies, if required.

USE PRECAUTIONS AND RESTRICTIONS

- Do not apply to intertidal or estuarine areas.
- There is no post-application holding restriction against use of treated water for drinking or recreational purposes (e.g. swimming, fishing).
- In areas with dense weed vegetation only treat 1/2 the water body at one time and wait 10-14 days before treating the remaining area. Do not retreat the same section of water within 28 days of application.
- Treated water may not be used for irrigation purposes on food crops until at least five (5) days after application.
- Treated water may be used for irrigation purposes on turf and landscape ornamentals as outlined in the *Irrigation Restrictions Following Application* table.
- Do not use in water utilized for crawfish farming.
- Do not re-treat the same section of water with this product more than 6 times per year.
- Do not exceed 400 ppb of this product during any one application.

IRRIGATION RESTRICTIONS FOLLOWING APPLICATION

Application Method	Application Rate	Average Water Depth	Turf and Landscape Ornamentals	Ornamentals grown for production in Greenhouse and Nursery
Surface Spray	6 to 12 oz per surface acre	Greater than 3 feet	None	5 days
		Less than 3 feet	12 hours	5 days
Subsurface	Less than 200 ppb	N/A	1 day	5 days
	200 to 300 ppb	N/A	2 days	5 days
	300 to 400 ppb	N/A	3 days	5 days

SPRAY DRIFT MANAGEMENT FOR FOLIAR OR SURFACE APPLICATIONS

Avoiding spray drift at the application site is the responsibility of the applicator. The interaction of many equipment and weather-related factors determine the potential for spray drift. The applicator is responsible for considering all these factors when making decisions.

Do not spray this product under circumstances where spray droplets may drift on to unprotected persons, or plantings of food, forage or crops that might be damaged, or rendered unfit for sale, use or consumption. These precautions are not applicable for subsurface injection by closed systems.

- Use the largest droplet size consistent with acceptable efficacy. Formation of very small droplets may be minimized by appropriate nozzle selection, by orienting nozzles away from the air stream as much as possible and by avoiding excessive spray boom pressure. For ground boom and aerial applications, use medium or coarser spray nozzles according to ASAE 572 definition for standard nozzles or a volume mean diameter (VMD) of 300 microns or greater for spinning atomizer nozzles.
- Make aerial, ground or watercraft-based surface applications when wind velocity favors on-target product deposition. Apply only when the wind speed is less than or equal to 10 mph.
- Do not make aerial or ground applications into areas of temperature inversions. Inversions are characterized by stable air and increasing temperatures with increasing distance above the ground. Mist or fog may indicate the presence of an inversion in humid areas. Where permissible by local regulations, the applicator may detect the presence of an inversion by producing smoke and observing a smoke layer near the ground surface.
- Low humidity and high temperatures increase the evaporation rate of spray droplets, and therefore the likelihood of increased spray drift. Avoid spraying during conditions of low humidity and/or high temperatures.

Properly maintain and calibrate all aerial, ground and water based application equipment.

Where states have more stringent regulations, they should be observed.

APPLICATION AND SPRAYER INFORMATION

Mixing Instructions

- Mix with water having pH of 5 to 7. If pH is higher than 7, use an appropriate buffer to reduce pH to desirable range.
- Fill clean spray tank 1/2 full of desired level with water and add buffering agent if necessary.
- Add the required amount of this product to the spray tank while agitating.
- Fill spray tank to desired level with water. Ensure that this product is thoroughly mixed before making applications. Agitation should continue until spray solution has been applied.
- Mix only the amount of spray solution that can be applied the day of mixing. Apply this product within 12 hours of mixing.

ADDITIVES

When applying this product to the foliage of floating or emerged aquatic weeds, mix with an adjuvant approved for use in aquatic sites. Mix this product with a non-ionic surfactant containing at least 80% active ingredient. Follow adjuvant manufacturer's label rates. Mixing compatibility should be verified by a jar test before using.

JAR TEST TO DETERMINE COMPATIBILITY OF ADJUVANTS AND CLIPPER SC

A jar test should be performed before mixing commercial quantities of this product, when using this product for the first time, when using new adjuvants or when a new water source is being used.

1. Add 1 pint of the water to a quart jar. The water should be from the same source and temperature as which will be used in the spray tank mixing operation.
2. Add 1 milliliter of this product to the quart jar for every 3 fluid ounces of this product per acre being applied (4 milliliters if 12 fluid ounces per acre is the desired rate of this product), gently mix until product goes into suspension.
3. Add 60 milliliters (4 Tablespoons or 2 fluid ounces) of the crop oil or methylated seed oil to the quart jar or 1 milliliter of non-ionic surfactant if it is being used in place of oil, gently mix.
4. If nitrogen is being used, add 16 milliliters (1 Tablespoon. or 0.5 ounce) of the 28 to 32% nitrogen source to the quart jar. If ammonium sulfate is being used, add 19 g AMS to the quart jar in place of the 28 to 32% nitrogen.
5. Place cap on jar, invert 10 times, let stand for 15 minutes, evaluate.
6. An ideal tank mix combination will be uniform. If any of the following conditions are observed the choice of adjuvant should be questioned:
 - a) Layer of oil or globules on the mixture's surface.
 - b) Flocculation: fine particles in suspension or as a layer on the bottom of the jar.
 - c) Clabbering: Thickening texture (coagulated) like gelatin.

(continued)

Sprayer Cleanup

If spray equipment is dedicated to application of aquatic herbicides, the following steps are recommended to clean the spray equipment:

- Completely drain the spray tank and rinse the application equipment thoroughly, including the inside and outside of the tank and all in-line screens.

If spray equipment will be used for purposes other than applying aquatic herbicides, it must be thoroughly cleaned following application of this product. The following steps must be used to clean the spray equipment:

1. Completely drain the spray tank and rinse the application equipment thoroughly, including the inside and outside of the tank and all in-line screens.
2. Fill the tank with clean water and flush all hoses, booms, screens and nozzles.
3. Top off tank with clean water.
4. Circulate through sprayer for 5 minutes.
5. Then flush all hoses, booms, screens and nozzles for a minimum of 15 minutes.
6. Drain tank completely.
7. Remove all nozzles and screens and rinse them with clean water.

AERIAL APPLICATION

To obtain satisfactory weed control, aerial application of this product, must provide uniform coverage of surface weeds and sufficient contact time. When applied by air, this product may not provide adequate control of some submersed weeds. Do not apply by air when significant drift on to non-target plants may occur or when wind velocity is more than 10 mph. Avoid spraying this product within 200 feet of dwellings, adjacent sensitive crops or environmentally sensitive areas. To obtain satisfactory application and avoid drift, the following directions must be observed:

Volume and Pressure

Apply this product in a minimum of 5 gallons of water per acre with a maximum spray pressure of 40 PSI. Application at less than 5 gallons per acre may not provide adequate weed control. Higher gallonage applications generally provide more consistent weed control.

Nozzles and Nozzle Operation

Use nozzles that produce flat or hollow cone spray patterns. Use non-drip type nozzles such as diaphragm type nozzles to avoid unwanted discharge of spray solution. The nozzle must be directed toward the rear of the aircraft, at an angle between 0° and 15° downward. Do not place nozzles on the outer 25% of the wings or rotors.

Adjuvants

Refer to the additive section or the tank mix partners label for adjuvant recommendation.

DIRECTIONS FOR USE

TO CONTROL FLOATING AND EMERGED WEEDS USING SURFACE APPLICATION

This product will control weeds and algae listed in Table 1 when applied as a broadcast spray with appropriate equipment. For best results, apply this product to the foliage of actively growing weeds.

Table 1. Floating and Emerged Weeds

Common Name	Scientific Name
Alligator Weed	<i>Alternanthera philoxeroides</i>
Duckweed*	<i>Lemna</i> spp.
Frog's-bit	<i>Limnobium spongia</i>
Water Fern	<i>Salvinia</i> spp.
Water Lettuce	<i>Pistia stratiotes</i>
Watermeal*	<i>Wolffia</i> spp.
Water Pennywort	<i>Hydrocotyle</i> spp.
Filamentous algae	<i>Pithophara</i>
Filamentous algae	<i>Cladophora</i>

*200 ppb water concentration rate may be required to treat duckweed and watermeal – see **DIRECTIONS FOR USE TO CONTROL SUBMERSED AND FLOATING WEEDS USING SUBSURFACE APPLICATIONS** section for additional application information.

Surface Application

Apply this product as a broadcast spray at 6 to 12 fluid ounces of formulated product per acre plus an adjuvant approved for use in aquatics.

This product is a contact herbicide that quickly degrades in the water column so plants that do not initially come in contact with the herbicide will not be controlled. Apply this product in a minimum of 30 gallons of water per acre to all areas of the water body where weeds exist. Coverage is essential for effective control as all floating weeds need to be exposed to lethal concentrations in all parts of the water body. Any untreated escapes or re-introductions of plants that were not treated will reestablish in areas where surface weeds had previously been controlled. If a second application is required to provide control, it is recommended that a treatment be made once the return of these weeds is first observed, but no sooner than 28 days after the last treatment.

Application of this product during early morning hours may enhance weed control. When applying to densely packed actively growing surface weeds, ensure adequate coverage. Rapid decomposition of vegetation resulting from herbicide treatment can result in loss of oxygen in water. A sudden decrease in dissolved oxygen can result in fish suffocation. If aquatic vegetation is dense, treat floating surface weeds in sections to avoid a rapid decrease in dissolved oxygen.

This product may be tank mixed with 2,4-D, diquat, glyphosate or other registered foliar applied herbicides for enhanced control of floating and emergent weeds.

Consult a manufacturer's label for specific rate restrictions and weeds controlled. Always follow the most restrictive label restrictions and precautions for all products used when making an applications involving tank mixes.

Application Equipment

Apply this product with sprayers equipped with nozzles designed to deliver the desired spray pressure and spray volume. Apply by backpack or handgun sprayer, airboat, helicopter, airplane or other application equipment that will ensure thorough coverage of target plant foliage.

DIRECTIONS FOR USE TO CONTROL SUBMERSED AND FLOATING WEEDS USING SUBSURFACE APPLICATIONS

This product will control submersed and floating weeds listed in Table 2, *Submersed and Floating Weeds Controlled by Subsurface Application*, when applied subsurface with appropriate equipment.

Table 2. Submersed and Floating Weeds Controlled by Subsurface Application

Common Name	Scientific Name
Coontail	<i>Ceratophyllum demersum</i>
Duckweed	<i>Lemna</i> spp.
Fanwort	<i>Cabomba caroliniana</i>
Hydrilla	<i>Hydrilla verticillata</i>
Hygrophila	<i>Hygrophila polysperma</i>
Naiad, Southern	<i>Najas guadalupensis</i>
Pondweed, Curlyleaf	<i>Potamogeton crispus</i>
Pondweed, Sago	<i>Potamogeton pectinatus</i>
Pondweed, Variable-Leaf	<i>Potamogeton diversifolius</i>
Water Fern	<i>Salvinia</i> spp.
Water Lettuce	<i>Pistia stratiotes</i>
Watermeal	<i>Wolffia</i> spp.
Watermilfoil, Eurasian	<i>Myriophyllum spicatum</i>
Watermilfoil, Variable-Leaf	<i>Myriophyllum heterophyllum</i>

Subsurface Application

Apply this product at a rate that will produce an initial concentration of 200 to 400 ppb (of active ingredient flumioxazin) in the water column.

This product is rapidly absorbed by target plants, but also breaks down quickly in water with a pH greater than 8.5. The pH of water surrounding mats of submersed vegetation can exceed 8.5 by early to mid-day, due to photosynthetic processes. Application of this product under these conditions may provide only partial weed control, and regrowth is likely. For best control, apply this product in a minimum of 30 gallons of water per acre in the early morning to actively growing weeds and early in the season before surface matting occurs. Complete coverage and sufficient contact time of submersed weeds with this product is required for optimal performance. Application of this product with subsurface trailing hoses designed to distribute the herbicide within the plant stand will provide more effective and longer term control of submersed weeds. Use Table 3, *Subsurface Application Rates* to determine the amount of this product needed to achieve desired concentration at different water depths. Use higher concentrations when weed biomass is heavy and/or weeds are more mature and topped out. Any untreated plants that are left in the water column can re-infest treated areas that had previously been controlled. If a second application is required to provide control, it is recommended that a treatment be made once the return of these weeds is first observed, but no sooner than 28 days after the last treatment.

When applying this product to densely packed actively growing submersed weeds, a rapid decomposition of vegetation resulting from herbicide treatment can result in loss of oxygen in water. A sudden decrease in dissolved oxygen can result in fish suffocation. If aquatic vegetation is dense, treat submersed weeds in sections to avoid a rapid decrease in dissolved oxygen.

This product may be tank mixed with other registered submersed applied herbicides for enhanced control of submersed and floating weeds.

Application Equipment for Water Column Treatment

To improve distribution in the water column and ensure adequate coverage, when possible apply this product with subsurface trailing hoses in order to place the herbicide under the surface and throughout the biomass of aquatic vegetation. Keep swath width to a minimum in order to maximize contact with submersed aquatic vegetation. In small shallow water bodies, surface sprays may be required to apply this product. Apply by backpack or handgun sprayer or other application equipment that will ensure adequate coverage of target plant.

Information on Hydrilla Control in Florida

This product should be applied as a subsurface treatment for hydrilla control. For best control of hydrilla apply during the late Winter/early Spring and/or early to late Fall. Efficacy of this product will be enhanced at these timings due to lower potential biomass present and lower pH of the water. If applied to mature topped out hydrilla, this product will cause some discoloration and loss of growing tips, but regrowth will be rapid.

Tank mixing this product with other registered herbicides is recommended, especially if hydrilla is approaching maturity or biomass is heavy.

Table 3. Subsurface Application Rates

Water Depth (feet)	1.2 Pints of Clipper SC Aquatic Herbicide Required Per Surface Acre to Achieve Desired Water Concentration		
	200 ppb	300 ppb	400 ppb
1	1.1	1.6	2.1
2	2.1	3.2	4.2
3	3.2	4.8	6.4
4	4.2	6.4	8.5
5	5.3	8.0	10.6
6	6.4	9.5	12.7
7	7.4	11.1	14.8

Example: to achieve an initial concentration of 200 ppb of flumioxazin in a 4 foot deep water column, apply 5 pints of this product per surface acre.

STORAGE AND DISPOSAL

Do not contaminate water, food or feed by storage, disposal or cleaning of equipment.

PESTICIDE STORAGE

Keep pesticide in original container. Store in a cool, dry, secure place. Do not put formulation or dilute spray solution into food or drink containers. Do not contaminate food or foodstuffs. Do not store or transport near feed or food. Not for use or storage in or around the home. For help with any spill, leak, fire or exposure involving this material, call day or night CHEMTREC (800) 424-9300.

PESTICIDE DISPOSAL

Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility.

CONTAINER HANDLING:

[Nonrefillable Containers 5 gallons or less:] Nonrefillable container. Do not reuse or refill this container. Offer for recycling if available. Triple rinse container (or equivalent) promptly after emptying. **Triple rinse as follows:**

Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container 1/4 full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by other procedures approved by State and local authorities. Plastic containers are also disposable by incineration, or, if allowed by State and local authorities, by burning. If burned stay out of smoke.

[Nonrefillable containers larger than 5 gallons:] Nonrefillable container. Do not reuse or refill this container. Offer for recycling if available. If recycling or reconditioning not available, puncture and dispose of in a sanitary landfill, or by other procedures approved by State and local authorities. Plastic containers are also disposable by incineration, or, if allowed by State and local authorities, by burning. If burned stay out of smoke. Triple rinse or pressure rinse container (or equivalent) promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank. Fill the container 1/4 full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Turn the container over onto its other end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Repeat this procedure two more times. Pressure rinse as follows: Empty the remaining contents into application equipment or a mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank or collect rinsate for later use or disposal. Insert pressure rinsing nozzle in the side of the container, and rinse at about 40 psi for at least 30 seconds. Drain for 10 seconds after the flow begins to drip.

[Refillable containers larger than 5 gallons:] Refillable container. Refill this container with pesticide only. Do not reuse this container for any other purpose. Cleaning the container before final disposal is the responsibility of the person disposing of the container. Cleaning before refilling is the responsibility of the refiller. To clean the container before final disposal, empty the remaining contents from this container into application equipment or a mix tank. Fill the container about 10% full with water. Agitate vigorously or recirculate water with the pump for two minutes. Pour or pump rinsate into application equipment or rinsate collection system. Repeat this rinsing procedure two more times.

WARRANTY DISCLAIMER

The directions for use of this product must be followed carefully. **TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, (1) THE GOODS DELIVERED TO YOU ARE FURNISHED "AS IS" BY MANUFACTURER OR SELLER AND (2) MANUFACTURER AND SELLER MAKE NO WARRANTIES, GUARANTEES, OR REPRESENTATIONS OF ANY KIND TO BUYER OR USER, EITHER EXPRESS OR IMPLIED, OR BY USAGE OF TRADE, STATUTORY OR OTHERWISE, WITH REGARD TO THE PRODUCT SOLD, INCLUDING, BUT NOT LIMITED TO MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, USE, OR ELIGIBILITY OF THE PRODUCT FOR ANY PARTICULAR TRADE USAGE.** UNINTENDED CONSEQUENCES, INCLUDING BUT NOT LIMITED TO INEFFECTIVENESS, MAY RESULT BECAUSE OF SUCH FACTORS AS THE PRESENCE OR ABSENCE OF OTHER MATERIALS USED IN COMBINATION WITH THE GOODS, OR THE MANNER OF USE OR APPLICATION, INCLUDING WEATHER, ALL OF WHICH ARE BEYOND THE CONTROL OF MANUFACTURER OR SELLER AND ASSUMED BY BUYER OR USER. THIS WRITING CONTAINS ALL OF THE REPRESENTATIONS AND AGREEMENTS BETWEEN BUYER, MANUFACTURER AND SELLER, AND NO PERSON OR AGENT OF MANUFACTURER OR SELLER HAS ANY AUTHORITY TO MAKE ANY REPRESENTATION OR WARRANTY OR AGREEMENT RELATING IN ANY WAY TO THESE GOODS.

LIMITATION OF LIABILITY

TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, IN NO EVENT SHALL MANUFACTURER OR SELLER BE LIABLE FOR SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, OR FOR DAMAGES IN THEIR NATURE OF PENALTIES RELATING TO THE GOODS SOLD, INCLUDING USE, APPLICATION, HANDLING, AND DISPOSAL. TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, MANUFACTURER OR SELLER SHALL NOT BE LIABLE TO BUYER OR USER BY WAY OF INDEMNIFICATION TO BUYER OR TO CUSTOMERS OF BUYER, IF ANY, OR FOR ANY DAMAGES OR SUMS OF MONEY, CLAIMS OR DEMANDS WHATSOEVER, RESULTING FROM OR BY REASON OF, OR ARISING OUT OF THE MISUSE, OR FAILURE TO FOLLOW LABEL WARNINGS OR INSTRUCTIONS FOR USE, OF THE GOODS SOLD BY MANUFACTURER OR SELLER TO BUYER. TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, ALL SUCH RISKS SHALL BE ASSUMED BY THE BUYER, USER, OR ITS CUSTOMERS. TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, BUYER'S OR USER'S EXCLUSIVE REMEDY, AND MANUFACTURER'S OR SELLER'S TOTAL LIABILITY SHALL BE FOR DAMAGES NOT EXCEEDING THE COST OF THE PRODUCT.

If you do not agree with or do not accept any of the directions for use, the warranty disclaimers, or limitations on liability, do not use the product, and return it unopened to the Seller, and the purchase price will be refunded.

RV031616

Clipper is a registered trademark of Valent U.S.A. Corporation.



FLUMIOXAZIN GROUP 14 HERBICIDE

FLUMIGARD™

Herbicide

FOR USE IN CONTAINER AND FIELD GROWN CONIFERS (INCLUDING CHRISTMAS TREES) AND DECIDUOUS TREES, AROUND ESTABLISHED WOODY ORNAMENTALS IN LANDSCAPES, TO MAINTAIN BARE GROUND NON-CROP AREAS, CONIFER AND POPLAR RE-FORESTATION SITES*, AND DORMANT TURFGRASS, FOR THE MANAGEMENT OF UNDESIRABLE AQUATIC VEGETATION IN SLOW MOVING OR QUIESCENT WATERS (TO CONTROL FLOATING AND EMERGED WEEDS USING SURFACE AND SUBSURFACE APPLICATIONS)

*Not approved for use in conifer and poplar re-forestation sites in California.

ACTIVE INGREDIENT:	By Wt
Flumioxazin*	51.0%
OTHER INGREDIENTS:	49.0%
TOTAL:	100.0%

*(2-[7-flouro-3,4-dihydro-3-oxo-4-(2-propynyl)-2H-1,4-benzoxazin-6-yl]-4,5,6,7-tetrahydro-1H-isindole-1,3(2H)-dione)

Alligare FLUMIGARD™ Herbicide is a water dispersible granule containing 51% active ingredient.

EPA Reg. No. 81927-68 EPA Est. No. 81927-AL-001^{PM}; 37429-GA-001^{BT}
Letter(s) in lot number correspond(s) to superscript in EPA Est. No.

KEEP OUT OF REACH OF CHILDREN

CAUTION

Manufactured for: Alligare, LLC
1565 5th Avenue • Opelika, AL 36801

Net Weight: 5 lbs.

FIRST AID

If inhaled: Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth, if possible. Call a poison control center or doctor for further treatment advice.

If on skin or clothing: Take off contaminated clothing. Rinse skin immediately with plenty of water for 15 to 20 minutes. Call a poison control center or doctor for treatment advice.

If in eyes: Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for treatment advice.

If swallowed: Call a poison control center or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by a poison control center or doctor. Do not give anything by mouth to an unconscious person.

HOT LINE NUMBER: Have the product container or label with you when calling a poison control center or doctor, or going for treatment. You may also contact 1-800-424-9300 for emergency medical treatment information.

See inside label booklet for Precautionary Statements and Directions for Use.



EPA 20180928

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PRECAUTIONARY STATEMENTS
HAZARDS TO HUMANS AND DOMESTIC ANIMALS
CAUTION

Harmful if inhaled or absorbed through the skin. Causes moderate eye irritation. Avoid breathing dust and spray mist. Avoid contact with skin, eyes or clothing. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, or using tobacco. Remove and wash contaminated clothing before reuse.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Applicators and other handlers must wear:

- Long-sleeved shirt and long pants
- Waterproof gloves
- Shoes and socks

USER SAFETY REQUIREMENTS

Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables exist, use detergent and hot water. Keep and wash PPE separately from other laundry.

USER SAFETY RECOMMENDATIONS

Users should:

- Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
- Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

ENVIRONMENTAL HAZARDS

Terrestrial Uses

This product is toxic to non-target plants and aquatic invertebrates. Do not apply directly to water, to areas where surface water is present or to intertidal areas below the mean high-water mark. Drift and runoff may be hazardous to non-target plants and aquatic organisms in neighboring areas. Do not apply where runoff is likely to occur. Do not apply when weather conditions favor drift from treated areas. Do not contaminate water when disposing of equipment washwaters or rinsate.

This pesticide is toxic to plants and must be used strictly in accordance with the drift and run-off precautions on this label in order to minimize off-site exposures.

Under some conditions this product may have a potential to run off to surface water or adjacent land. Where possible, use methods which reduce soil erosion, including no-till, limited till and contour plowing; these methods also reduce pesticide run-off. Use of vegetation filter strips along rivers, creeks, streams, wetlands or on the downhill side of fields where run-off could occur will minimize water run-off.

Aquatic Uses

If not used in accordance with directions on the label, this product can be toxic to non-target plants and aquatic invertebrates. Do not apply to water except as specified on the label. Drift and runoff may be hazardous to non-target plants and aquatic organisms in neighboring areas, if not used in accordance to label directions. Do not apply where runoff is likely to occur. Do not apply when weather conditions favor drift from treated areas. Do not contaminate water when disposing of equipment washwaters.

This pesticide is toxic to plants and must be used strictly in accordance with the drift and run-off precautions on this label in order to minimize off-site exposures.

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

READ ENTIRE LABEL. USE STRICTLY IN ACCORDANCE WITH PRECAUTIONARY STATEMENTS AND DIRECTIONS, AND WITH APPLICABLE STATE AND FEDERAL REGULATIONS.

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your State or Tribe, consult the agency responsible for pesticide regulation.

AGRICULTURAL USE REQUIREMENTS

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR Part 170. This Standard contains requirements for the protections of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific statements on this label about personal protective equipment (PPE), and restricted-entry interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

Do not enter or allow worker entry into treated areas during the restricted entry interval (REI) of 12 hours.

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, including plants, soil, or water, is:

- Coveralls
- Waterproof gloves
- Shoes plus socks

NON-AGRICULTURAL USE REQUIREMENTS

The requirements in this box apply to uses of this product that are NOT within the scope of the Worker Protection Standards for agricultural pesticides (40 CFR, Part 170). The WPS applies when this product is used to produce agricultural plants on farms, forests, nurseries, or greenhouses.

Keep all unprotected persons out of operating areas, or vicinity where there may be drift.

Do not enter or allow others to enter treated areas until sprays have dried.

TANK MIXES

NOTICE: Tank mixing or use of this product with any other product which is not specifically and expressly authorized by the label shall be the exclusive risk of user, applicator and/or application advisor, to the extent allowed by applicable law.

It is the pesticide user's responsibility to ensure that all products are registered for the intended use. Read and follow the applicable restrictions and limitations and directions for use on all product labels involved in tank mixing. Users must follow the most restrictive directions for use and precautionary statements of each product in the tank mixture.

PRODUCT INFORMATION

Terrestrial Uses

Alligare FLUMIGARD Herbicide is a preemergence and early postemergence herbicide for control of selected grass and broadleaf weeds in and around ornamental woody shrubs, deciduous trees and conifers (including Christmas trees) grown outdoors in containers or in the field (in ground), to maintain bare ground non-crop areas, conifer and poplar reforestation and dormant warm season turfgrass.

Alligare FLUMIGARD Herbicide controls weeds by inhibiting protoporphyrinogen oxidase, an essential enzyme required by plants for chlorophyll biosynthesis. Seedling weeds are controlled preemergence when exposed to sunlight following contact with the soil applied herbicide.

Alligare FLUMIGARD Herbicide may cause spotting or speckling on foliage if the spray solution directly contacts actively growing plant foliage or green bark. Leaves that receive indirect (drift) spray contact may be affected in a similar manner. Translocation of Alligare FLUMIGARD Herbicide is limited, and under most conditions established and vigorously growing woody ornamentals will rapidly outgrow any injury symptoms. **However, direct application to actively growing foliage can cause severe injury or death with sensitive ornamental plant species, especially in herbaceous bedding plants and flowers.**

IMPORTANT: When applied as directed, plants listed on

this label have shown tolerance to Alligare FLUMIGARD Herbicide. However, Alligare FLUMIGARD Herbicide is a very active herbicide. Exercise responsible judgment and caution until familiarity is gained with this product. Due to variability within species, crop growth stage, environmental conditions and application techniques, it is advised that users test this product under local growing conditions on a small number of plants and evaluate for 4 to 6 weeks for phytotoxicity. Testing Alligare FLUMIGARD Herbicide on a small number of plants will determine if the herbicide can be used safely on a widespread application. Neither the seller nor the manufacturer of Alligare FLUMIGARD Herbicide has investigated the safety to plants not listed on the label.

TERRESTRIAL USE RESTRICTIONS

- Do not apply more than 12 oz (0.38 lb ai/A) of Alligare FLUMIGARD Herbicide per acre per application.
- Do not apply more than 24 oz (0.76 lb ai/A) of Alligare FLUMIGARD Herbicide per acre per year.
- Do not apply within 300 feet of non-dormant pome or stone fruit crops.
- Do not apply in enclosed greenhouse structures if plants are present.
- Do not move plants for 24 hours into enclosed greenhouses until the Alligare FLUMIGARD Herbicide treated area has been watered.
- Do not apply when weather conditions favor spray drift from treated areas.
- Do not graze treated fields or hay to livestock.
- Do not incorporate into soil after application.
- Do not apply this product through any type of irrigation system.
- Do not apply when plants are under stress from insects, diseases, animals or winter injury, planting shock or any other stresses. Only apply to healthy established trees and ornamentals.

TERRESTRIAL USE PRECAUTIONS

- Treatment of powdery, dry soil or light sandy soil, or light sandy soil when there is little to no likelihood of rainfall soon after may result in off target movement and possible damage to actively growing susceptible crops when soil

particles are moved by wind or water. Do not apply when these soil and environmental conditions are present.

Aquatic Uses

Alligare FLUMIGARD Herbicide is a fast-acting contact herbicide that controls selected submersed, emergent and floating aquatic weeds. It is most effective when applied to young, actively growing weeds in water with a pH of less than 8.5.

Alligare FLUMIGARD Herbicide may be applied to the following quiescent or slow-moving bodies of water:

- Bayous
- Canals
- Drainage ditches
- Lakes
- Marshes
- Ponds (including golf course ponds)
- Reservoirs

Application of Alligare FLUMIGARD Herbicide to public aquatic areas may require special approval and/or permits. Consult with local state agencies, if required.

AQUATIC USE RESTRICTIONS

- Do not exceed 400 ppb of Alligare FLUMIGARD Herbicide during any one application.
- Do not apply to intertidal or estuarine areas.
- Do not use in water utilized for crawfish farming.
- Do not re-treat the same section of water with Alligare FLUMIGARD Herbicide more than 6 times per year.
- Do not re-treat the same section of water within 28 days of application.

There is no post-application holding restriction against use of treated water for drinking or recreational purposes (e.g., swimming, fishing). In areas with dense weed vegetation, only treat ½ the water body at one time and wait 10-14 days before treating the remaining area. Treated water may not be used for irrigation purposes on food crops until at least five (5) days after application. Treated water may be used for irrigation purposes on turf and landscape ornamentals as outlined in the *Irrigation Restrictions Following Application* table.

IRRIGATION RESTRICTIONS FOLLOWING APPLICATION

Application Method	Application Rate	Average Water Depth	Turf and Landscape Ornamentals	Ornamentals grown for production in Greenhouse and Nursery
Surface Spray	6 to 12 oz per surface acre	Greater than 3 feet	None	5 days
		Less than 3 feet	12 hours	5 days
Subsurface	Less than 200 ppb	N/A	1 day	5 days
	200 to 300 ppb	N/A	2 days	5 days
	300 to 400 ppb	N/A	3 days	5 days

RESISTANCE MANAGEMENT

For resistance management, Alligare FLUMIGARD Herbicide is a Group 14 herbicide. Any weed population may contain or develop plants naturally resistant to Alligare FLUMIGARD Herbicide and other Group 14 herbicides. The resistant biotypes may dominate the weed population if these herbicides are used repeatedly in the same use site. Follow appropriate resistance-management strategies.

To delay herbicide resistance take one or more of the following steps:

- Avoid the consecutive use of Alligare FLUMIGARD Herbicide or other target site of action Group 14 herbicides that might have a similar target site of action, on the same weed species.
- Use tank mixtures or premixes with herbicides from different target site of action Groups as long as the involved products are all registered for the same use, have different sites of action and are both effective at the tank mix or prepack rate on the weed(s) of concern.
- Base herbicide use on a comprehensive Integrated Pest Management (IPM) program.
- Scout fields prior to application to identify the weed species present and their growth state to determine if the intended application will be effective.

- Scout fields after application to verify that the treatment was effective and to monitor weed populations for early signs of resistance development.
- Contact your local extension specialist, certified crop advisors and/or manufacturer for herbicide resistance management and/or integrated weed management recommendations for specific crops and resistant weed biotypes.

Suspected herbicide-resistant weeds may be identified by these indicators:

- o Failure to control a weed species normally controlled by the herbicide at the dose applied, especially if control is achieved on adjacent weeds;
- o A spreading patch of non-controlled plants of a particular weed species; and
- o Surviving plants mixed with controlled individuals of the same species.

Report any incidence of non-performance of this product against a particular weed species to your Alligare LLC retailer, representative or call 888-252-4427. If resistance is suspected, treat weed escapes with an herbicide having a different mechanism of action and/or use non-chemicals means to remove escapes, as practical, with the goal of preventing further seed production.

PREEMERGENCE APPLICATION

Preemergence weed control with Alligare FLUMIGARD Herbicide is most effective when applied to clean, weed free soil surfaces prior to weed emergence. Moisture is necessary to activate Alligare FLUMIGARD Herbicide on soil for residual weed control. Dry weather following application of Alligare FLUMIGARD Herbicide may reduce effectiveness. However, when adequate moisture is received after dry conditions, Alligare FLUMIGARD Herbicide will control susceptible germinating weeds.

POSTEMERGENCE APPLICATION

The most effective postemergence weed control with Alligare FLUMIGARD Herbicide occurs when applied in combination with a surfactant to weeds less than 2 inches in height. Apply Alligare FLUMIGARD Herbicide only to actively growing weeds. Applying Alligare FLUMIGARD Herbicide under conditions that do not promote active weed growth will reduce herbicide effectiveness. Alligare FLUMIGARD Herbicide is most effective when applied under sunny conditions at temperatures above 65°F.

Alligare FLUMIGARD Herbicide is rainfast one hour after application. Do not apply if rain is expected within one hour of application or efficacy may be reduced.

SOIL CHARACTERISTICS

Application of Alligare FLUMIGARD Herbicide to soils with high organic matter and/or high clay content may require higher dosages than with soils with low organic matter and/or low clay content. Application to cloddy seedbeds can result in reduced weed control.

CARRIER VOLUME AND SPRAY PRESSURE

PREEMERGENCE APPLICATION

To ensure uniform coverage when using boom sprayers, use at least 10 gals of spray solution per acre. When making backpack applications, apply 50 to 100 gals of spray solution per acre. Nozzle selection must meet manufacturer's gallonage and pressure specifications for preemergence herbicide application.

POSTEMERGENCE APPLICATION

To ensure thorough coverage when using boom sprayers, apply at least 15 gals of spray solution per acre. Apply at least 20 gals per acre when using a boom sprayer if dense vegetation or heavy residue is present on the soil surface. When applying with a backpack sprayer, apply 1 gal of spray solution per 500 to 1,000 sq ft. Nozzle selection must meet manufacturer's gallonage and pressure specifications for postemergence herbicide application.

ADDITIVES

POSTEMERGENCE APPLICATION

When applying Alligare FLUMIGARD Herbicide after weeds emerge, mix with an agronomically approved adjuvant. Mix Alligare FLUMIGARD Herbicide with a crop oil concentrate that contains at least 15% emulsifiers and 80% oil or a non-ionic surfactant containing at least 80% active ingredient when applying Alligare FLUMIGARD Herbicide as part of a postemergence weed control program. Verify mixing compatibility by a jar test before using. Do not mix Alligare FLUMIGARD Herbicide with a surfactant when applying over the top of dormant woody ornamentals or conifer trees.

Buffering Agents and Water Conditioners - A spray-grade nitrogen source (either ammonium sulfate at 2.0 to 2.5 lb/A or a 28 to 32% nitrogen solution at 1 to 2 qts/A) may be added to the spray mixture along with a crop oil concentrate or non-ionic surfactant to enhance weed control. The addition of a nitrogen source does not replace the need for crop oil concentrate or non-ionic surfactant.

JAR TEST TO DETERMINE COMPATIBILITY OF ADJUVANTS AND ALLIGARE FLUMIGARD HERBICIDE

Perform a jar test before mixing commercial quantities of Alligare FLUMIGARD Herbicide, when using Alligare FLUMIGARD Herbicide for the first time, when using new adjuvants or when a new water source is being used.

1. Add 1 pt. of water to a quart jar. Use water from the same source and the same temperature as the water used in the spray tank mixing operation.

2. Add 3 grams (approximately 1 level tsp) of Alligare FLUMIGARD Herbicide for the 8 oz/A rate or 4 grams (approximately 1 ½ tsp) for 12 oz/A rate to the jar. Gently mix until product disperses.
3. Add 60 ml (4 Tbsp or 2 fl oz) of additive to the quart jar and gently mix.
4. If nitrogen is being used, add 16 ml (1 Tbsp) of the 28 to 32% nitrogen source to the quart jar. If ammonium sulfate is being used, add 19 grams of AMS to the quart jar in place of the 28 to 32% nitrogen.
5. Place cap on jar, invert 10 times, let stand for 15 minutes, evaluate.
6. An ideal tank mix combination will be uniform and free of suspended particles. If any of the following conditions are observed question the choice of adjuvant:
 - a) Layer of oil or globules on the solution surface.
 - b) Flocculation: Fine particles in suspension or as a layer on the bottom of the jar.
 - c) Clabbering: Thickening texture (coagulated) like gelatin.

APPLICATION EQUIPMENT

Important: Thoroughly clean spray equipment, including all tanks, hoses, booms, screens and nozzles, after application of Alligare FLUMIGARD Herbicide. Equipment with Alligare FLUMIGARD Herbicide residue remaining in the system may result in crop injury to subsequently treated crops.

SPRAYER PREPARATION

Before applying Alligare FLUMIGARD Herbicide, clean the spray tank, as well as all hoses and booms to ensure no residue from the previous spraying operation remains in the sprayer. Some pesticides, including but not limited to the sulfonyleurea and phenoxy herbicides, are active at very small amounts and can cause crop injury when applied to susceptible crops. Clean spray equipment according to the manufacturer's directions for the last product used before the equipment is used to apply Alligare FLUMIGARD Herbicide. If two or more products were tank mixed prior to Alligare FLUMIGARD Herbicide application, follow the most restric-

tive cleanup procedure on the label of all products.

MIXING INSTRUCTIONS

1. Fill clean spray tank 1/2 to 2/3 of desired level with clean water.
2. To ensure a uniform spray mixture, pre-slurry the required amount of Alligare FLUMIGARD Herbicide with water prior to addition to the spray tank. Use a minimum of 1 gal of water per 10 oz of Alligare FLUMIGARD Herbicide.
3. While agitating, slowly add the pre-slurried Alligare FLUMIGARD Herbicide to the spray tank. Agitation creates a rippling or rolling action of the water surface.
4. If tank mixing Alligare FLUMIGARD Herbicide with other labeled herbicides, add water soluble bags first, followed by dry formulations, flowables, emulsifiable concentrates and then solutions. Prepare no more spray mixture than is required for the immediate spray operation.
5. Add any required adjuvants.
6. Fill spray tank to desired level with water. **Continue agitation until spray solution has been applied.**
7. Mix only the amount of spray solution that can be applied the day of mixing. **Apply Alligare FLUMIGARD Herbicide within 12 hours of mixing.**

SPRAYER CLEANUP

Spray equipment must be cleaned each day following Alligare FLUMIGARD Herbicide application. After Alligare FLUMIGARD Herbicide is applied, the following steps must be used to clean the spray equipment:

- Completely drain the spray tank and rinse the sprayer thoroughly, including the inside and outside of the tank and all in-line screens.
- Fill the tank with clean water and flush all hoses, booms, screens and nozzles.
- Top off tank with clean water and household ammonia. Use 1 gal of 3% household ammonia for every 100 gals of water.
- Circulate through sprayer for 5 minutes.
- Then flush all hoses, booms, screens and nozzles for a minimum of 15 minutes.

- Loosen any diaphragms before flushing the spray system, allowing cleaning solution to spray through the open diaphragm.
- Drain tank completely.
- Add enough clean water to the spray tank to flush hoses, booms, screens and nozzles for 2 minutes.
- Remove all nozzles and screens and rinse them with clean water.

APPLICATION EQUIPMENT

Application equipment must be clean and in good repair. Nozzles must be uniformly spaced on boom and frequently checked for accuracy.

BROADCAST APPLICATION

Apply Alligare FLUMIGARD Herbicide, and Alligare FLUMIGARD Herbicide tank mixes, with ground equipment using standard commercial sprayers equipped with nozzles designed to deliver the desired spray pressure and spray volume.

BAND APPLICATION

When banding, use proportionately less water and Alligare FLUMIGARD Herbicide per acre.

HANDGUN APPLICATION

Applications may also be made using a handgun sprayer. Use a spray volume of at least 40 gals per acre to ensure uniform coverage.

BACKPACK APPLICATION

When applying Alligare FLUMIGARD Herbicide with a backpack sprayer follow all above restrictions. Calibrate backpack sprayers to deliver 1 gal of spray solution per 500 to 1,000 sq ft.

For Backpack Applications of Alligare FLUMIGARD Herbicide at 10 oz per acre

Application Volume	Amount of Alligare FLUMIGARD Herbicide to mix in 1 gal of water	Amount of Alligare FLUMIGARD Herbicide to mix in 2 gals of water	Amount of Alligare FLUMIGARD Herbicide to mix in 3 gals of water
1 gal per 500 sq ft (= 87 GPA)	1 ¼ tsp	2 ½ tsp	3 ¾ tsp
1 gal per 750 sq ft (= 58 GPA)	1 ¾ tsp	3 ½ tsp	5 ¼ tsp
1 gal per 1,000 sq ft (= 43.5 GPA)	2 ½ tsp	5 tsp	7 ½ tsp

1 level teaspoon (tsp) holds 2.8 grams of Alligare FLUMIGARD Herbicide.

Example: Applicator wants to spray 1 gal of Alligare FLUMIGARD Herbicide solution per 1,000 sq ft of ground bed, and wants to mix up 2 gals of spray solution. Therefore, mix 5 teaspoons of Alligare FLUMIGARD Herbicide in 2 gals of water.

AERIAL APPLICATION

To obtain satisfactory weed control with aerial application of Alligare FLUMIGARD Herbicide, coverage must be uniform. Do not spray when drift is possible or when wind velocity is more than 10 mph. Avoid spraying Alligare FLUMIGARD Herbicide within 200 feet of dwellings, adjacent sensitive crops or environmentally sensitive areas. To obtain satisfactory application and drift, the following directions must be observed:

- **Volume Pressure**

Apply Alligare FLUMIGARD Herbicide in 5 to 10 gals of water per acre, with a maximum spray pressure of 40 PSI. Application at less than 5 gals per acre may not provide adequate weed control. Higher gallonage applications provide more consistent weed control.

- **Nozzles and Nozzle Operation**

Use nozzles that produce flat or hollow cone spray patterns. Use non-drip type nozzles to avoid unwanted discharge of spray solution. The nozzle must be directed toward the rear of the aircraft, at an angle between 0 and 15° downward. Do not place nozzles on the outer 25% of the wings or rotors.

- **Adjuvants**

Refer to the additive section or the tank mix partners label for adjuvant directions.

CALIBRATION TABLE

ALLIGARE FLUMIGARD HERBICIDE RATES OZ/A	ALLIGARE FLUMIGARD HERBICIDE RATES GRAMS/GAL	ALLIGARE FLUMIGARD HERBICIDE RATES PER GAL
8	2.3	$\frac{3}{4}$ tsp
10	2.8	1 level tsp
12	3.4	1 $\frac{1}{4}$ tsp

SPRAY DRIFT MANAGEMENT

SPRAY DRIFT REDUCTION

Terrestrial Uses

Do not apply under circumstances where possible drift to unprotected persons or to food, forage or other plantings that might be damaged or crops thereof rendered unfit for sale, use or consumption can occur.

- Use the largest droplet size consistent with acceptable efficacy. Formation of very small droplets may be minimized by appropriate nozzle selection, by orienting nozzles away from the air stream as much as possible and by avoiding excessive spray boom pressure. For ground boom and aerial applications, use medium or coarser spray nozzles according to ASAE 572 definition for standard nozzles or a volume mean diameter (VMD) of 300 microns or greater for spinning atomizer nozzles.
- Make aerial or ground applications when the wind velocity favors on-target product deposition. Apply only when the wind speed is less than or equal to 10 mph. For all non-aerial applications, wind speed must be measured adjacent to the application site on the upwind side, immediately prior to application.
- Do not make aerial or ground applications into areas of temperature inversions. Inversions are characterized by stable air and increasing temperatures with increasing distance above the ground. Mist or fog may indicate the presence of an inversion in humid areas. Where permissible by local regulations, the applicator may detect the presence of an inversion by producing smoke and observing a smoke layer near the ground surface.
- Low humidity and high temperatures increase the evaporation rate of spray droplets and therefore the likelihood of increased spray drift. Avoid spraying during conditions of low humidity and/or high temperatures.
- All aerial and ground application equipment must be properly maintained and calibrated using appropriate carriers.
- For ground boom applications, apply with nozzle height no more than 4 ft above the ground or crop canopy.

Aquatic Uses

Avoiding spray drift at the application site is the responsibility of the applicator. The interaction of many equipment and weather-related factors determine the potential for spray drift. The applicator is responsible for considering all these factors when making decisions.

Do not spray Alligare FLUMIGARD Herbicide under circumstances where spray droplets may drift on to unprotected persons, or plantings of food, forage or crops that might be damaged, or rendered unfit for sale, use or consumption. These precautions are not applicable for subsurface injection by closed systems.

- Use the largest droplet size consistent with acceptable efficacy. Formation of very small droplets may be minimized by appropriate nozzle selection, by orienting nozzles away from the air stream as much as possible and by avoiding excessive spray boom pressure. For ground boom and aerial applications, use medium or coarser spray nozzles according to ASAE 572 definition for standard nozzles or a volume mean diameter (VMD) of 300 microns or greater for spinning atomizer nozzles.
- Make aerial, ground or watercraft-based surface applications when wind velocity favors on-target product deposition. Apply only when the wind speed is less than or equal to 10 mph.
- Do not make aerial or ground applications into areas of temperature inversions. Inversions are characterized by stable air and increasing temperatures with increasing distance above the ground. Mist or fog may indicate the presence of an inversion in humid areas. Where permissible by local regulations, the applicator may detect the presence of an inversion by producing smoke and observing a smoke layer near the ground surface.
- Low humidity and high temperatures increase the evaporation rate of spray droplets, and therefore the likelihood of increased spray drift. Avoid spraying during conditions of low humidity and/or high temperatures.

Properly maintain and calibrate all aerial, ground and water-based application equipment.

Where states have more stringent regulations, they must be observed.

TERRESTRIAL WEEDS CONTROLLED

When Alligare FLUMIGARD Herbicide is applied preemergence or postemergence at specified rates and weed stages, the following grasses and broadleaf weeds are controlled.

TABLE 1. WEEDS CONTROLLED BY ALLIGARE FLUMIGARD HERBICIDE

Common Name	Scientific Name
Alyssum, Hoary	<i>Berteroa incana</i>
Amaranth	
Palmer	<i>Amaranthus palmeri</i>
Spiny	<i>Amaranthus spinosus</i>
American Burnweed	<i>Erechtites hieracifolia</i>
Barnyardgrass*	<i>Echinochloa crus-galli</i>
Beggarweed, Florida	<i>Desmodium tortuosum</i>
Bittercress, Hairy	<i>Cardamine hirsuta</i>
Bluegrass, Annual	<i>Poa annua</i>
Burclover, California	<i>Medicago polymorpha</i>
Carpetweed	<i>Mollugo verticillata</i>
Chamberbitter	<i>Phyllanthus urinaria</i>
Chickweed	
Common	<i>Stellaria media</i>
Mouseear	<i>Cerastium vulgatum</i>
Crabgrass	
Large*	<i>Digitaria sanguinalis</i>
Smooth*	<i>Digitaria ischaemum</i>
Southern*	<i>Digitaria ciliaris</i>
Croton, Tropic	<i>Croton glandulosus</i> var. <i>septentrionalis</i>
Dandelion*	<i>Taraxacum officinale</i>
Dogfennel	<i>Eupatorium capillifolium</i>
Doveweed	<i>Murdannia nudiflora</i>
Eclipta	<i>Eclipta prostrata</i>
Filaree, Redstem*	<i>Erodium cicutarium</i>

Common Name	Scientific Name
Foxtail	
Bristly*	<i>Setaria verticillata</i>
Giant*	<i>Setaria faberi</i>
Green*	<i>Setaria viridis</i>
Yellow*	<i>Setaria glauca</i>
Galinsoga, Hairy	<i>Galinsoga ciliata</i>
Geranium, Carolina	<i>Geranium carolinianum</i>
Goosegrass*	<i>Eleusine indica</i>
Groundsel, Common	<i>Senecio vulgaris</i>
Groundsel Tree	<i>Baccharis halimifolia</i>
Henbit	<i>Lamium amplexicaule</i>
Horseweed*	<i>Conyza canadensis</i>
Indigo, Hairy	<i>Indigofera hirsuta</i>
Ivy, Ground*	<i>Glechoma hederacea</i>
Jimsonweed	<i>Datura stramonium</i>
Kochia	<i>Kochia scoparia</i>
Kyllinga, Green*	<i>Kyllinga brevifolia</i>
Ladysthumb	<i>Polygonum persicaria</i>
Lambsquarters, Common	<i>Chenopodium album</i>
Liverwort	<i>Marchantia polymorpha</i>
Lovegrass, California*	<i>Eragrostis diffusa</i>
Mallow	
Common	<i>Malva neglecta</i>
Little	<i>Malva parviflora</i>
Venice	<i>Hibiscus trionum</i>
Marsh Parsley	<i>Apium leptophyllum</i>
Marsh Yellowcress	<i>Rorippa islandica</i>
Mayweed*	<i>Anthemis cotula</i>
Morningglory	
Entireleaf	<i>Ipomoea hederacea</i> var. <i>integrifolia</i>
Ivyleaf	<i>Ipomoea hederacea</i>
Red/Scarlet	<i>Ipomoea coccinea</i>
Smallflower	<i>Jacquemontia tamnifolia</i>
Tall	<i>Ipomoea purpurea</i>
Moss	<i>Bryum</i> spp.
Mulberry Weed	<i>Fatua villosa</i>
Mustard	
Tumble	<i>Sisymbrium altissimum</i>
Wild	<i>Brassica kaber</i>

Common Name	Scientific Name
Nightshade	
Black	<i>Solanum nigrum</i>
Eastern Black	<i>Solanum ptychanthum</i>
Hairy	<i>Solanum sarrachoides</i>
Northern Willowherb	<i>Epilobium ciliatum</i>
Panicum	
Fall*	<i>Panicum dichotomiflorum</i>
Texas*	<i>Panicum texanum</i>
Parsley-Piert	<i>Alchemilla arvensis</i>
Pearlwort, Birdseye*	<i>Sagina procumbens</i>
Pennycress, Field	<i>Thlaspi arvense</i>
Phyllanthus, Longstalked	<i>Phyllanthus tenellus</i>
Pigweed	
Prostrate	<i>Amaranthus blitoides</i>
Redroot	<i>Amaranthus retroflexus</i>
Smooth	<i>Amaranthus hybridus</i>
Tumble	<i>Amaranthus albus</i>
Pineappleweed*	<i>Matricaria matricarioides</i>
Plantain	
Broadleaf*	<i>Plantago major</i>
Buckhorn*	<i>Plantago lanceolata</i>
Poinsettia, Wild	<i>Euphorbia heterophylla</i>
Puncturevine	<i>Tribulus terrestris</i>
Purslane, Common	<i>Portulaca oleracea</i>
Pusley, Florida	<i>Richardia scabra</i>
Ragweed	
Common	<i>Ambrosia artemisiifolia</i>
Giant	<i>Ambrosia trifida</i>
Redmaids	<i>Calandrinia ciliata</i>
Redweed	<i>Melochia corchorifolia</i>
Rocket, Yellow	<i>Barbarea vulgaris</i>
Senna, Coffee	<i>Cassia occidentalis</i>
Sesbania, Hemp	<i>Sesbania exaltata</i>
Shepherd's-Purse	<i>Capsella bursa-pastoris</i>
Sida, Prickly (Teaweed)	<i>Sida spinosa</i>
Signalgrass*	<i>Brachiaria platyphylla</i>
Smartweed, Pennsylvania	<i>Polygonum pennsylvanicum</i>
Sowthistle, Annual	<i>Sonchus oleraceus</i>
Spiderwort, Tropical	<i>Commelina benghalensis</i>

Common Name	Scientific Name
Spurge	
Petty	<i>Euphorbia peplus</i>
Prostrate	<i>Euphorbia humistrata</i> Engelm
Spotted	<i>Euphorbia maculata</i>
Starbur, Bristly*	<i>Acanthospermum hispidum</i>
Tassel-flower	<i>Emilia</i> spp.
Thickhead	<i>Crassocephalum crepidoides</i>
Thistle	
Canada*	<i>Cirsium arvense</i>
Russian	<i>Salsola iberica</i>
Velvetleaf	<i>Abutilon theophrasti</i>
Waterhemp	
Common	<i>Amaranthus rudis</i>
Tall	<i>Amaranthus tuberculatus</i>
Woodsorrel, Yellow*	<i>Oxalis stricta</i>

*Preemergence control only.

DIRECTIONS FOR USE TO MAINTAIN BARE GROUND NON- CROP AREAS

Alligare FLUMIGARD Herbicide, when used as directed, can be used for non-selective vegetation control to maintain bare ground non-crop areas that must be kept weed-free. Apply Alligare FLUMIGARD Herbicide to:

- Bare ground under guard rails, above-ground pipelines, and railroad beds, railroad yards and surrounding area.
- Bare ground in parking and storage areas, plant sites, substations, pumping stations, and tank farms
- Bare ground areas of airports, brick yards, industrial plant sites, lumber yards, military installations, and storage areas
- Bare ground around farm buildings, and along ungrazed fence rows, wind breaks and shelter belts
- Road surfaces, improved roadside areas and gravel shoulders

Follow all applicable directions as outlined above under

Product Information. See Table 1 for a list of broadleaf weeds and grasses controlled by Alligare FLUMIGARD Herbicide.

Alligare FLUMIGARD Herbicide offers residual and postemergence control of susceptible broadleaf and grass weeds as well as additional mode of action to assist in the control of ALS (acetolactate synthase) resistant weeds. The length of residual control is dependent on the rate applied as well as on rainfall and temperature conditions. Length of residual control will decrease as temperature and precipitation increase.

PREEMERGENCE APPLICATION

Apply 8 to 12 oz (0.25 to 0.38 lb ai/A) of Alligare FLUMIGARD Herbicide per broadcast acre as a preemergence application. Preemergence applications of Alligare FLUMIGARD Herbicide must be completed prior to weed emergence. Moisture is necessary to activate Alligare FLUMIGARD Herbicide on soil for residual weed control. Dry weather following application of Alligare FLUMIGARD Herbicide may reduce effectiveness. However, when adequate moisture is received after dry conditions, Alligare FLUMIGARD Herbicide will control susceptible germinating weeds.

POSTEMERGENCE APPLICATION

Apply 8 to 12 oz (0.25 to 0.38 lb ai/A) of Alligare FLUMIGARD Herbicide per broadcast acre plus an adjuvant (0.25% v/v non-ionic surfactant or 1 qt/A crop oil concentrate). The addition of an adjuvant enhances Alligare FLUMIGARD Herbicide activity on emerged weeds. Thorough spray coverage is necessary to maximize the postemergence activity of Alligare FLUMIGARD Herbicide. Emerged weeds are controlled postemergence with Alligare FLUMIGARD Herbicide, however, translocation of Alligare FLUMIGARD Herbicide within a weed is limited, and control is affected by spray coverage and by the addition of an adjuvant. The most effective postemergence weed control with Alligare FLUMIGARD Herbicide occurs when applied in combination with a surfactant to weeds less than 2 inches in height.

AERIAL APPLICATION

- Aerial applications are limited to maintaining weed free railroad beds, railroad yards and surrounding areas and military installations.

TANK MIX APPLICATION

In addition to weeds controlled by Alligare FLUMIGARD Herbicide used alone, tank mixtures with other preemergence and postemergence herbicides registered for use in non-crop areas provide a broader spectrum of weed control. Alligare FLUMIGARD Herbicide must be tank mixed with other non-crop herbicides including, but not limited to those products listed below.

TANK MIX COMBINATIONS FOR NON-SELECTIVE VEGETATION CONTROL

2,4-D	hexazinone	picloram
bromacil	imazapic	pramitol
chlorsulfuron	imazapyr	prodiamine
dicamba	metsulfuron methyl	simazine
diuron	norfurazon	sulfometuron methyl
clopyralid	oryzalin	tebuthiuron
glyphosate	pendimethalin	triclopyr

IMPORTANT: Completely read and follow the label of any potential Alligare FLUMIGARD Herbicide tank mix partner. It is the pesticide user's responsibility to ensure that all products are registered for the intended use. Read and follow the applicable restrictions and limitations and directions for use on all product labels involved in tank mixing. Users must follow the most restrictive directions for use and precautionary statements of each product in the tank mixture.

RESTRICTIONS AND LIMITATIONS

- Do not apply more than 2 applications at 12 oz/A (0.38 lb ai/A) or 3 applications at 8 oz/A (0.25 lb ai/A) per year.
- Do not re-apply Alligare FLUMIGARD Herbicide within 30 days.

DIRECTIONS FOR USE IN ESTABLISHED CONTAINER AND FIELD GROWN CONIFERS

(INCLUDING CHRISTMAS TREES)

Apply Alligare FLUMIGARD Herbicide as a single or split application to established container and field grown conifers, which includes applications to Christmas tree plantations. The conifers listed in Table 2 have exhibited tolerance to Alligare FLUMIGARD Herbicide only when the product is applied to dormant or hardened off plant material. If applied over the top of plant foliage, apply Alligare FLUMIGARD Herbicide before spring bud break or after conifers have sufficiently hardened off. During periods of cool, cloudy weather, use caution to ensure conifers have hardened off prior to herbicide application. Do not apply to conifers within 1 year of seedling emergence.

PREEMERGENCE APPLICATION

Apply 8 to 12 oz (0.25 to 0.38 lb ai/A) of Alligare FLUMIGARD Herbicide per broadcast acre before weeds emerge. Apply to weed free, established conifers grown in containers or in the field (in ground). If possible, irrigate treated area with 0.5 to 0.75 inch of water immediately following application. Alligare FLUMIGARD Herbicide may be sprayed directly over conifers listed in Table 2, provided bud break has not occurred or plants are hardened off. Needle burn may be observed on new flush if plants are actively growing at time of application. However, Alligare FLUMIGARD Herbicide will typically not affect subsequent growth. If conifers are not dormant or hardened off at time of application, and foliar injury cannot be tolerated, apply Alligare FLUMIGARD Herbicide as a directed spray, taking care to minimize direct contact or drift of spray onto foliage. Mechanically incorporating Alligare FLUMIGARD Herbicide after application will disturb soil surfaces, which may reduce herbicidal efficacy. When applied before weed germination, Alligare FLUMIGARD Herbicide will control broadleaf and grassy weeds listed in Table 1.

POSTEMERGENCE APPLICATION

Apply 8 to 12 oz (0.25 to 0.38 lb ai/A) of Alligare FLUMIGARD Herbicide per broadcast acre after weeds have emerged. Alligare FLUMIGARD Herbicide may be sprayed directly

over conifers listed in Table 2, provided bud break has not occurred or plants are hardened. Needle burn may be observed on new flush if plants are actively growing at time of application. However, Alligare FLUMIGARD Herbicide will typically not affect subsequent growth. If conifers are not dormant or hardened off at the time of application, and foliar injury cannot be tolerated, apply Alligare FLUMIGARD Herbicide as a directed spray, taking care to minimize direct contact or drift of spray onto foliage.

If applied when weeds are actively growing and no larger than 2 inches in height, Alligare FLUMIGARD Herbicide will provide postemergence control of broadleaf weeds and grasses listed in Table 1. Postemergence control of Alligare FLUMIGARD Herbicide may be more effective with certain weed species, and may not control mature, stressed or hardened off weeds that are not actively growing at the time of application.

TANK MIXTURES FOR CONTAINER AND FIELD GROWN CONIFERS

Tank mixing Alligare FLUMIGARD Herbicide with other preemergence and postemergence herbicides registered for use on conifers may provide a broader spectrum of weed control than Alligare FLUMIGARD Herbicide applied alone. Alligare FLUMIGARD Herbicide may also be applied as part of a postemergence burndown program for control of annual and perennial weeds. Tank mixing Alligare FLUMIGARD Herbicide with glyphosate will increase the speed of burndown compared to glyphosate applied alone. Alligare FLUMIGARD Herbicide may be tank mixed with products containing the following active ingredients labeled for use in conifers:

clethodim
glyphosate*
oryzalin
prodiamine
simazine*

*Do not apply glyphosate or simazine to containerized ornamentals.

IMPORTANT: Completely read and follow the label of any potential Alligare FLUMIGARD Herbicide tank mix partner.

When tank mixing Alligare FLUMIGARD Herbicide with other herbicides, always follow the most restrictive label limitations and precautions on the label of any tank mix partner.

TOLERANT CONIFERS

Alligare FLUMIGARD Herbicide may be applied to the conifer species listed in Table 2. If a desired conifer species is not listed in Table 2, evaluate the safety of Alligare FLUMIGARD Herbicide on a small number of plants under commercial growing conditions, and monitor plant response for four to six weeks for phytotoxicity. Testing Alligare FLUMIGARD Herbicide on a small number of plants will determine if Alligare FLUMIGARD Herbicide can be used safely on a widespread basis.

RESTRICTIONS AND LIMITATIONS

- Do not apply more than 2 applications at 12 oz/A (0.38 lb ai/A) or 3 applications at 8 oz/A (0.25 lb ai/A) per year.
- Do not re-apply Alligare FLUMIGARD Herbicide within 30 days.

TABLE 2. TOLERANT CONIFERS

Common Name	Scientific Name
Arborvitae	
American	<i>Thuja occidentalis</i>
Oriental	<i>Thuja orientalis</i>
Fir	
Concolor	<i>Abies concolor</i>
Cork Bark	<i>Abies lasiocarpa</i>
Douglas	<i>Pseudotsuga menziesii</i>
Fraser	<i>Abies fraseri</i>
Grand	<i>Abies grandis</i>
Noble	<i>Abies procera</i>
Turkish	<i>Abies bommuelleriana</i>
Hemlock	
Eastern	<i>Tsuga canadensis</i>
Western	<i>Tsuga heterophylla</i>

Common Name	Scientific Name
Juniper	
Blue Star	<i>Juniperus scopularum</i>
Creeping	<i>Juniperus horizontalis</i>
Japanese Garden	<i>Juniperus chinensis</i>
Tamarix	<i>Juniperus Sabina</i>
Pine	
Austrian	<i>Pinus nigra</i>
Eastern White	<i>Pinus strobus</i>
Jack	<i>Pinus banksiana</i>
Japanese Black	<i>Pinus thunbergiana</i>
Loblolly	<i>Pinus taeda</i>
Lodgepole	<i>Pinus contorta</i>
Longleaf	<i>Pinus palustris</i>
Mugo	<i>Pinus mugo</i>
Ponderosa	<i>Pinus ponderosa</i>
Sand	<i>Pinus clausa</i>
Scotch	<i>Pinus sylvestris</i>
Shortleaf	<i>Pinus echinata</i>
Slash	<i>Pinus elliotii</i>
Virginia	<i>Pinus virginiana</i>
Spruce	
Blue	<i>Picea pungens</i>
Dwarf Alberta	<i>Picea glauca conica</i>
Norway	<i>Picea abies</i>
Sitka	<i>Picea sitchensis</i>
Yew	
English	<i>Taxus baccata</i>
Japanese	<i>Taxus cuspidata</i>

DIRECTIONS FOR USE IN CONTAINER AND FIELD GROWN DECIDUOUS TREES AND NON-BEARING FRUIT AND NON- BEARING NUT TREES

Alligare FLUMIGARD Herbicide may be applied as single or split applications to container and field grown deciduous trees with an established root system. The deciduous trees listed in Table 3 have exhibited tolerance to Alligare FLUMIGARD Herbicide only when applied to the soil and base of plants. Application of Alligare FLUMIGARD

Herbicide to deciduous foliage or green bark may result in unacceptable injury.

Alligare FLUMIGARD Herbicide may be applied to established (or transplanted) container and field grown deciduous trees. Do not apply to trees that are less than one year old or have been transplanted less than one year, unless completely protected by non-porous wraps, grow tubes, waxed protectors or other forms of protection to young foliage and/or bark. Do not harvest fruit or nuts from treated trees within one year of application.

IMPORTANT: Direct application of Alligare FLUMIGARD Herbicide to the soil surface and away from plant foliage and bark. Avoid direct spray contact on plant surfaces, foliage and green bark or injury may result. Application of Alligare FLUMIGARD Herbicide after bud swell may cause injury if herbicide contacts foliage. Avoid application under environmental conditions that favor drift to non-targeted areas.

PREEMERGENCE APPLICATION

Apply 8 to 12 oz (0.25 to 0.38 lb ai/A) of Alligare FLUMIGARD Herbicide per broadcast acre as a preemergence (to weed emergence) application. Apply Alligare FLUMIGARD Herbicide to weed free deciduous trees grown in containers or in the field (in ground). If possible, irrigate treated area with 0.5 to 0.75 inch of water immediately following application. Alligare FLUMIGARD Herbicide may be applied to the soil surface and base of deciduous trees, provided that direct and indirect (drift) applications to plant foliage, flowers and green bark does not occur. Mechanically incorporating Alligare FLUMIGARD Herbicide will disturb soil surfaces, which may reduce herbicidal efficacy. The use of spray shields that limit exposure of foliage and bark to Alligare FLUMIGARD Herbicide is suggested. When applied before weed germination, Alligare FLUMIGARD Herbicide will control broadleaf and grassy weeds listed in Table 1.

POSTEMERGENCE APPLICATION

Apply 8 to 12 oz (0.25 to 0.38 lb ai/A) of Alligare FLUMIGARD Herbicide per broadcast acre plus an adjuvant (0.25% v/v non-ionic surfactant or 1 qt/A crop oil concentrate). Make

postemergence (to weed emergence) applications of Alligare FLUMIGARD Herbicide when weeds are actively growing and are no larger than 2 inches in height. The addition of a surfactant enhances Alligare FLUMIGARD Herbicide activity on emerged weeds. Thorough spray coverage is necessary to maximize the postemergence activity of Alligare FLUMIGARD Herbicide. When applied after weed germination, Alligare FLUMIGARD Herbicide will provide preemergence and postemergence control of broadleaf weeds and grasses listed in Table 1. If plant injury is a concern, use a spray shield to limit the exposure of trees to Alligare FLUMIGARD Herbicide.

Postemergence control of Alligare FLUMIGARD Herbicide may be more effective with certain weed species, and may not control mature, stressed or hardened off weeds that are not actively growing at the time of application.

TANK MIXTURES FOR FIELD AND CONTAINER GROWN DECIDUOUS TREES

Tank mixing Alligare FLUMIGARD Herbicide with other preemergence and postemergence herbicides registered for use on deciduous trees may provide a broader spectrum of weed control than Alligare FLUMIGARD Herbicide alone. Alligare FLUMIGARD Herbicide may also be applied as part of a postemergence burndown program of control of annual and perennial weeds. Tank mixing Alligare FLUMIGARD Herbicide with glyphosate will increase the speed of burn-down compared to glyphosate applied alone. Alligare FLUMIGARD Herbicide may be tank mixed with products containing the following active ingredient labeled for use in deciduous trees:

- clethodim
- glyphosate*
- oryzalin
- pendimethalin
- prodiamine
- simazine*

*Do not apply glyphosate or simazine to containerized plants.

IMPORTANT: Completely read and follow the label of any

herbicides mixed with Alligare FLUMIGARD Herbicide. It is the pesticide user's responsibility to ensure that all products are registered for the intended use. Read and follow the applicable restrictions and limitations and directions for use on all product labels involved in tank mixing. Users must follow the most restrictive directions for use and precautionary statements of each product in the tank mixture.

TOLERANT DECIDUOUS TREES, NON-BEARING FRUIT AND NON-BEARING NUT TREES

Alligare FLUMIGARD Herbicide may be applied as a directed spray to the deciduous, non-bearing fruit and non-bearing nut tree species listed in Table 3. If a desired tree species is not listed in Table 3, evaluate the safety of Alligare FLUMIGARD Herbicide on a small number of plants under commercial growing conditions and monitor plant response for four to six weeks for phytotoxicity. Testing Alligare FLUMIGARD Herbicide on a small number of plants will determine if Alligare FLUMIGARD Herbicide can be used safely on a widespread basis.

RESTRICTIONS AND LIMITATIONS

- Do not apply more than 2 applications at 12 oz/A (0.38 lb ai/A) or 3 applications at 8 oz/A (0.25 lb ai/A) per year.
- Do not re-apply Alligare FLUMIGARD Herbicide within 30 days.

TABLE 3. TOLERANT DECIDUOUS TREE SPECIES

Common Name	Scientific Name
Apricot*	<i>Prunus</i> spp.
Ash	<i>Fraxinus</i> spp.
Birch	<i>Betula</i> spp.
Buckeye	<i>Aesculus</i> spp.
Cherry*	<i>Prunus</i> spp.
Chestnut	<i>Castanea</i> spp.
Citrus*	<i>Citrus</i> spp.
Dogwood	<i>Cornus</i> spp.
Eucalyptus	<i>Eucalyptus</i> spp.
Ginkgo	<i>Ginkgo</i> spp.
Hawthorn	<i>Crataegus</i> spp.
Honeylocust	<i>Gleditsia</i> spp.
Larch	<i>Larix</i> spp.
Lilac	<i>Syringa</i> spp.
Maple**	<i>Acer</i> spp.
Mrytle, Crepe	<i>Lagerstroemia indica</i>
Oak	<i>Quercus</i> spp.
Poplar	<i>Populus</i> spp.
Peach*	<i>Prunus</i> spp.
Plum*	<i>Prunus</i> spp.
Pecan*	<i>Carya</i> spp.
Redbud	<i>Cercis canadensis</i>
Sweetgum	<i>Liquidambar styraciflua</i>
Sycamore	<i>Platanus</i> spp.
Walnut, Black	<i>Juglans nigra</i>
Willow	<i>Salix</i> spp.

*Non-bearing trees only.

**Not for use on maple trees used for production of maple sap or syrup.

DIRECTIONS FOR USE AROUND ESTABLISHED WOODY LANDSCAPE ORNAMENTALS AND TO MAINTAIN BARE GROUND NON-CROP AREAS

In residential and commercial landscapes, Alligare FLUMIGARD Herbicide can only be applied by commercial licensed applicators. Application of Alligare FLUMIGARD

Herbicide in the vicinity of ornamental plants is limited to directed sprays around well-established woody shrubs and trees including azalea, euonymus, holly, and the conifers and deciduous trees listed in Tables 2 and 3. Alligare FLUMIGARD Herbicide may also be applied to maintain bare ground in non-crop areas in apartment complexes, fence rows, gravel surfaces, ground mats, golf courses, office complexes, parks, recreational sites, schools, sidewalks, and other similar sites. Do not apply Alligare FLUMIGARD Herbicide within any enclosed structure in residential or commercial landscapes.

Alligare FLUMIGARD Herbicide offers postemergence and residual control of susceptible grasses and broadleaf weeds, as well as additional mode of action to assist in the control of resistant weeds. The length of residual control is dependent on the rate applied, rainfall and temperature. Length of residual control will decrease as temperature and precipitation increase.

IMPORTANT: Contact with Alligare FLUMIGARD Herbicide spray or spray drift may cause severe injury or destruction of certain desirable plants, especially herbaceous species including bedding plants or direct seeded annual and perennial flowers. Therefore, do not apply Alligare FLUMIGARD Herbicide over the top of ornamental plants growing in the landscape, and do not allow Alligare FLUMIGARD Herbicide spray to contact, drift or splash from soil onto the foliage, green stems, exposed roots or fruit of desirable plants. Avoid application of Alligare FLUMIGARD Herbicide under conditions that favor drift of sprays onto desired ornamentals or turfgrass. Spray shields must be used to limit the plant exposure to Alligare FLUMIGARD Herbicide when applying near desirable plants.

Do not apply Alligare FLUMIGARD Herbicide around landscape ornamentals until plants have been actively growing for at least 30 days after transplanting, or for at least two months before ornamentals will be planted into treated areas.

PREEMERGENCE APPLICATION (NO WEEDS ARE PRESENT)

Mix 1 ¼ to 2 ½ tsp of Alligare FLUMIGARD Herbicide per gal (10 oz/A) of spray solution, and apply 1 gal of spray solution to 500 – 1,000 sq ft (10 oz/A) prior to weed germination (see calibration table for backpack sprayers). Apply Alligare FLUMIGARD Herbicide to weed free soil, mulch or gravel surfaces. Moisture is necessary to activate Alligare FLUMIGARD Herbicide on soil for residual weed control. When applied before weed germination, Alligare FLUMIGARD Herbicide will control the broadleaf weeds and grasses listed in Table 1.

Established landscape ornamentals have shown tolerance to Alligare FLUMIGARD Herbicide **only** when applied to the soil at the base of the plant. For maximum plant safety when using around desirable ornamentals, direct applications of Alligare FLUMIGARD Herbicide to the soil, and leave a sufficient untreated buffer to ensure spray solution does not contact desired plants. Do not harvest fruit or nuts from treated trees within one year of application.

POSTEMERGENCE APPLICATION (WEEDS ARE PRESENT)

Mix 1 ¼ to 2 ½ tsp of Alligare FLUMIGARD Herbicide per gal (10 oz/A) and apply 1 gal of spray solution to 500 – 1,000 sq ft to actively growing weeds (see calibration chart for backpack sprayers). Tank mixing Alligare FLUMIGARD Herbicide with glyphosate will increase the spectrum of postemergence weed control over Alligare FLUMIGARD Herbicide alone, provide faster postemergence weed control than glyphosate alone, and provide pre- and postemergence control of the broadleaf weeds and grasses listed in Table 1.

Established landscape ornamentals have shown tolerance to applications of Alligare FLUMIGARD Herbicide plus glyphosate **only** when applied to the soil at the base of the plant, and sprays do not directly contact or drift onto desirable plants. For maximum plant safety when using around desirable ornamentals, direct applications of Alligare FLUMIGARD Herbicide plus glyphosate towards the soil, and leave a sufficient non-treated buffer to ensure the spray solution does not contact desired plants.

Thorough spray coverage of weeds is necessary to maximize weed control. Apply uniformly, but do not spray to the point of runoff.

Do not harvest fruit or nuts from treated trees within one year of application.

IMPORTANT: Completely read and follow the glyphosate label. When tank mixing Alligare FLUMIGARD Herbicide with other products, always follow the most restrictive use conditions on either label.

RESTRICTIONS AND LIMITATIONS

- Do not apply more than 2 applications at 10 oz/A (0.32 lb ai/A) per year.
- Do not re-apply Alligare FLUMIGARD Herbicide within 30 days.

DIRECTIONS FOR USE TO MAINTAIN BARE GROUND NON-CROP AREAS IN AND AROUND ORNAMENTAL NURSERIES

Alligare FLUMIGARD Herbicide, when used as directed, can be used for non-selective vegetation control to maintain bare ground non-crop areas that must be kept weed-free. Apply Alligare FLUMIGARD Herbicide only to:

- Bare ground areas around buildings and other structures. Do not apply within any enclosed structure.
- Bare ground along fence rows.
- Gravel surfaces and driveways.
- Ground matting and gravel pads prior to the addition of containerized plants (conifers, deciduous trees and ornamentals).

IMPORTANT: Follow all applicable directions as outlined above under Product Information. See Table 1 for a list of grasses and broadleaf weeds controlled by Alligare FLUMIGARD Herbicide.

Alligare FLUMIGARD Herbicide offers residual and postemergence control of susceptible grasses and broadleaf weeds as well as additional mode of action to assist in the

control of resistant weeds. The length of residual control is dependent on the rate applied as well as on rainfall and temperature conditions. Length of residual control will decrease as temperature and precipitation increase.

PREEMERGENCE APPLICATION

Apply 8 to 12 oz (0.25 to 0.38 lb ai/A) of Alligare FLUMIGARD Herbicide per broadcast acre as a preemergence application. Preemergence applications of Alligare FLUMIGARD Herbicide must be completed prior to weed emergence. Moisture is necessary to activate Alligare FLUMIGARD Herbicide for residual weed control. Dry weather following application of Alligare FLUMIGARD Herbicide may reduce effectiveness. However, when adequate moisture is received after dry conditions, Alligare FLUMIGARD Herbicide will control susceptible germinating weeds.

POSTEMERGENCE APPLICATION

Apply 8 to 12 oz (0.25 to 0.38 lb ai/A) of Alligare FLUMIGARD Herbicide per broadcast acre plus a surfactant (0.25% v/v non-ionic surfactant or 1 qt/A crop oil concentrate). The addition of a surfactant enhances Alligare FLUMIGARD Herbicide activity on emerged weeds. Thorough spray coverage is necessary to maximize the postemergence activity of Alligare FLUMIGARD Herbicide. Emerged weeds are controlled postemergence with Alligare FLUMIGARD Herbicide, however, translocation of Alligare FLUMIGARD Herbicide within a weed is limited, and control is affected by spray coverage and by the addition of a surfactant. The most effective postemergence weed control with Alligare FLUMIGARD Herbicide occurs when applied in combination with a surfactant to weeds less than 2 inches in height.

RESTRICTIONS AND LIMITATIONS

- Do not apply more than 2 applications at 12 oz/A (0.38 lb ai/A) or 3 applications at 8 oz/A (0.25 lb ai/A) per year.
- Do not re-apply Alligare FLUMIGARD Herbicide within 30 days.

DIRECTIONS FOR USE IN CONIFER RE-FORESTATION SITES FOLLOWING TIMBER HARVEST

(Not for use in California)

Alligare FLUMIGARD Herbicide is a preemergence and postemergence herbicide for control of selected grass and broadleaf weeds in conifer re-forestation sites following timber harvest operations. Alligare FLUMIGARD Herbicide may be used as a site preparation treatment prior to transplanting of conifers or as a conifer release treatment after stand establishment.

Apply Alligare FLUMIGARD Herbicide in at least 10 gals of water per acre to achieve uniform spray coverage using ground or aerial spray equipment.

Site Preparation – Application Before Transplanting

Apply 8 to 12 oz of Alligare FLUMIGARD Herbicide (0.25 to 0.38 lb ai) per acre. Transplant operations must take place at least 2 months after application. To obtain optimal weed control, apply Alligare FLUMIGARD Herbicide before weed emergence or after a burndown herbicide has controlled existing vegetation. If existing weed canopy is less than 40%, Alligare FLUMIGARD Herbicide may be tank mixed with a burndown herbicide to provide preemergence weed control.

Conifer Release Treatments – Applications only within 3 years after transplanting.

Apply 8 to 12 oz of Alligare FLUMIGARD Herbicide (0.25 to 0.38 lb ai) per acre over the top of trees prior to budbreak in the spring or after dormancy in fall. Do not apply Alligare FLUMIGARD Herbicide over the top of trees after budbreak or needle spotting and defoliation may occur. Alligare FLUMIGARD Herbicide will not affect new growth of trees. See Table 4 for a list of tolerant conifers for over the top treatments. Do not apply Alligare FLUMIGARD Herbicide over the top unless trees are more than two years past seedling, also known as 1+1 stock.

TANK MIXING – Conifer Release Treatments

Certain liquid formulations of other pesticides may increase the postemergence activity of Alligare FLUMIGARD Herbicide, but may also increase the potential for injury when applied over the top of various plants. Therefore, tank mixtures of these materials with Alligare FLUMIGARD Herbicide may be more injurious than Alligare FLUMIGARD Herbicide applied alone and need to be tested to determine if they can be used safely on a widespread basis.

It is the pesticide user's responsibility to ensure that all products are registered for the intended use. Read and follow the applicable restrictions and limitations and directions for use on all product labels involved in tank mixing. Users must follow the most restrictive directions for use and precautionary statements of each product in the tank mixture.

ADJUVANTS – Conifer Release Treatments

When using as a Conifer Release Treatment, do not mix Alligare FLUMIGARD Herbicide with any adjuvant or fertilizer.

IMPORTANT: When applied as directed, the conifers listed in Table 4 have shown tolerance to Alligare FLUMIGARD Herbicide. However, Alligare FLUMIGARD Herbicide is a very active herbicide. Exercise responsible judgment and caution until familiarity is gained with this product. If a desired conifer species is not listed in Table 4, evaluate the safety of Alligare FLUMIGARD Herbicide on a small number of plants under commercial growing conditions, and monitor plant response for four to six weeks for phytotoxicity. Test Alligare FLUMIGARD Herbicide on a small number of plants to determine if Alligare FLUMIGARD Herbicide can be used safely on a widespread basis. The use of nylon mesh wraps, commonly used to deter animal browsing, may increase plant injury if placed on plants after over the top application of Alligare FLUMIGARD Herbicide.

RESTRICTIONS AND LIMITATIONS

- Do not apply more than 2 applications at 12 oz/A (0.38 lb ai/A) or 3 applications at 8 oz/A (0.25 lb ai/A) per year.

- Do not re-apply Alligare FLUMIGARD Herbicide within 30 days.

TABLE 4: TOLERANT CONIFER TREE SPECIES:

Common Name	Scientific Name
Fir	
Concolor	<i>Abies concolor</i>
Cork Bark	<i>Abies lasiocarpa</i>
Douglas	<i>Pseudotsuga menziesii</i>
Fraser	<i>Abies fraseri</i>
Grand	<i>Abies grandis</i>
Noble	<i>Abies procera</i>
Turkish	<i>Abies bommuelleriana</i>
Hemlock	
Eastern	<i>Tsuga canadensis</i>
Western	<i>Tsuga heterophylla</i>
Pine	
Austrian	<i>Pinus nigra</i>
Eastern White	<i>Pinus strobus</i>
Jack	<i>Pinus banksiana</i>
Japanese Black	<i>Pinus thunbergiana</i>
Loblolly	<i>Pinus taeda</i>
Lodgepole	<i>Pinus contorta</i>
Longleaf	<i>Pinus palustris</i>
Mugo	<i>Pinus mugo</i>
Ponderosa	<i>Pinus ponderosa</i>
Sand	<i>Pinus clausa</i>
Scotch	<i>Pinus sylvestris</i>
Shortleaf	<i>Pinus echinata</i>
Slash	<i>Pinus elliotii</i>
Virginia	<i>Pinus virginiana</i>
Spruce	
Blue	<i>Picea pungens</i>
Dwarf Alberta	<i>Picea glauca conica</i>
Norway	<i>Picea abies</i>
Sitka	<i>Picea sitchensis</i>

DIRECTIONS FOR USE IN POPLAR PLANTATIONS AND TIMBER RE-FORESTATION SITES (Not for use in California)

Alligare FLUMIGARD Herbicide is a preemergence and postemergence herbicide for control of selected grass and broadleaf weeds in poplar plantations and timber reforestation sites following timber harvest operations. Alligare FLUMIGARD Herbicide may be used as a site preparation treatment prior to transplanting of trees or as a release treatment after stand establishment.

Apply Alligare FLUMIGARD Herbicide in at least 10 gals of water per acre to achieve uniform spray coverage using ground or aerial spray equipment.

Site Preparation-Application Before Transplanting

Apply 8 to 12 oz of Alligare FLUMIGARD Herbicide (0.25 to 0.38 lb ai) per acre. Transplant operations must take place at least 3 months after application. To obtain optimal weed control, apply Alligare FLUMIGARD Herbicide before weed emergence or after a burndown herbicide has controlled existing vegetation. If existing weed canopy is less than 40%, Alligare FLUMIGARD Herbicide may be tank mixed with a burndown herbicide to provide preemergence weed control.

Release Treatments – Applications Within 3 Years After Transplanting

Apply 8 to 12 oz of Alligare FLUMIGARD Herbicide (0.25 to 0.38 lb ai) per acre over the top of trees prior to budbreak in the spring or after dormancy in fall. Do not apply Alligare FLUMIGARD Herbicide over the top of trees after budbreak or leaf spotting and defoliation may occur. Alligare FLUMIGARD Herbicide will not affect new growth of trees of tolerant poplars for over the top treatments. Do not apply Alligare FLUMIGARD Herbicide over the top unless trees are more than one year old.

TANK MIXING – Poplar Release Treatments

Certain liquid formulations of other pesticides may increase the postemergence activity of Alligare FLUMIGARD

Herbicide, but may also increase the potential for injury when applied over the top of various plants. Therefore, tank mixtures of these materials with Alligare FLUMIGARD Herbicide may be more injurious than Alligare FLUMIGARD Herbicide applied alone and need to be tested to determine if they can be used safely on a widespread basis.

It is the pesticide user's responsibility to ensure that all products are registered for the intended use. Read and follow the applicable restrictions and limitations and directions for use on all product labels involved in tank mixing. Users must follow the most restrictive directions for use and precautionary statements of each product in the tank mixture.

ADJUVANTS – Poplar Release Treatments

When applying Release Treatments, do not mix Alligare FLUMIGARD Herbicide with any adjuvant or fertilizer.

IMPORTANT: When applied as directed, poplars (*Populus balsamifera*, *P. grandidentata*, *P. niger* and *P. tremuloides*), hybrid poplars (*P. sp. x sp.*), and cottonwoods (*P. deltoides* and *P. trichocarpa*) have shown tolerance to Alligare FLUMIGARD Herbicide. However, Alligare FLUMIGARD Herbicide is a very active herbicide. Exercise responsible judgment and caution until familiarity is gained with this product. Test Alligare FLUMIGARD Herbicide on a small number of plants to determine if Alligare FLUMIGARD Herbicide can be used safely on a widespread basis.

RESTRICTIONS AND LIMITATIONS

- Do not apply more than 2 applications at 12 oz/A (0.38 lb ai/A) or 3 applications at 8 oz/A (0.25 lb ai/A) per year.
- Do not re-apply Alligare FLUMIGARD Herbicide within 30 days.

DIRECTIONS FOR USE ON DORMANT WARM-SEASON TURFGRASS GROWN ON RESIDENTIAL SITES, GOLF COURSES, SOD PRODUCTION AND SIMILAR AREAS

Alligare FLUMIGARD Herbicide may be applied as a single or split application to well established dormant turfgrass listed in Table 5. Alligare FLUMIGARD Herbicide will provide preemergence and early postemergence control of annual bluegrass, chickweed, henbit and other winter annual weeds found in Table 1. Alligare FLUMIGARD Herbicide will provide preemergence control of crabgrass, goosegrass and other summer annual weeds found in Table 1. Alligare FLUMIGARD Herbicide may be applied to dormant turfgrass in such areas as apartment complexes, golf courses, sod farms, roadsides, sports fields, campgrounds, office complexes, parks, parking areas, recreational sites, schools and other similar sites. Bermudagrass exhibits tolerance to Alligare FLUMIGARD Herbicide only when applied to semi-dormant or completely dormant turf in the late fall and before active growth resumes in the late winter/early spring. Application of Alligare FLUMIGARD Herbicide to actively growing turfgrass (warm season and cool season) or during green-up may cause unacceptable injury.

BROADCAST APPLICATIONS

Apply 8 to 12 oz of Alligare FLUMIGARD Herbicide (0.25 to 0.38 lb ai) per broadcast acre as a preemergence (to weed emergence) application. If weeds are present at the time of application apply Alligare FLUMIGARD Herbicide plus an adjuvant (0.25% v/v non-ionic surfactant). Make postemergence (to weed emergence) applications of Alligare FLUMIGARD Herbicide when weeds are actively growing and no larger than 2 inches in height. Thorough spray coverage is necessary to maximize the postemergence activity of Alligare FLUMIGARD Herbicide. When applied after weed germination, Alligare FLUMIGARD Herbicide will provide preemergence and postemergence control of broadleaf weeds and grasses listed in Table 1. Postemergence control of Alligare FLUMIGARD Herbicide may be more effective on certain weed species, and may not control mature, stressed or hardened off weeds that are not actively growing at the time of application.

Alligare FLUMIGARD Herbicide will provide best control of annual bluegrass when applied in the late fall while plants are small. Control may be less effective when applied in the winter under cold conditions when weeds are not actively growing. A second application of Alligare FLUMIGARD Herbicide may be required to provide adequate season-long annual bluegrass control. Alligare FLUMIGARD Herbicide will provide best control of crabgrass, goosegrass and other summer annual weeds when applied in the late winter before turfgrass resumes active growth.

SPOT TREATMENTS

Mix 2 ½ tsp per gal of Alligare FLUMIGARD Herbicide and 2 tsp (1/3 fl oz) of non-ionic surfactant in one gal of water and apply one gal of spray solution per 1,000 sq ft. Occasionally shake the spray solution while spraying to ensure the spray solution remains well mixed. Spray the target weeds until the leaves are wet.

TANK MIXING WITH OTHER TURFGRASS HERBICIDES

Alligare FLUMIGARD Herbicide will suppress, but will not effectively control established winter perennial weeds including dandelion and clover. Alligare FLUMIGARD Herbicide may be tank mixed with metsulfuron to control winter perennial weeds.

IMPORTANT: If applied in the fall to semi-dormant turfgrass, Alligare FLUMIGARD Herbicide may accelerate dormancy. If applied in the spring after turfgrass resumes active growth, Alligare FLUMIGARD Herbicide will cause temporary discoloration of turf and delay greenup.

It is the pesticide user's responsibility to ensure that all products are registered for the intended use. Read and follow the applicable restrictions and limitations and directions for use on all product labels involved in tank mixing. Users must follow the most restrictive directions for use and precautionary statements of each product in the tank mixture.

USE PRECAUTIONS

Use around Bentgrass and Poa Greens: Alligare FLUMIGARD Herbicide has limited potential for lateral movement on level terrain, but can potentially move down

slope after excessive rainfall and effect sensitive turf species including bentgrass and *Poa trivialis*. When applied upslope from bentgrass greens or bermudagrass greens overseeded with *Poa trivialis*, allow an adequate buffer zone between greens and the treated area. If uncertain about the size of the buffer, 15 feet is suggested. Risk of movement is decreased when Alligare FLUMIGARD Herbicide is applied to soil at less than field capacity. Avoid application when heavy rain is imminent or when the soil is saturated.

RESTRICTIONS AND LIMITATIONS

- Do not apply more than 2 applications at 12 oz/A (0.38 lb ai/A) or 3 applications at 8 oz/A (0.25 lb ai/A) per year.
- Do not apply to golf course putting greens.
- Do not apply to warm season turfgrass that has been overseeded with cool season turfgrass (ex. perennial rye, *Poa trivialis*).
- Do not irrigate within 1 hour before or after application.
- Do not apply if rain is expected within 1 hour after application.
- Do not mow turfgrass within 12 hours after application.
- Do not apply within 30 days prior to cutting or lifting sod.
- Do not re-apply Alligare FLUMIGARD Herbicide within 30 days.
- Do not apply in fall before turfgrass has ceased active growth or in late winter/early spring after turfgrass has resumed active growth.
- Allow 8 weeks between application and seeding or sodding of turfgrass.

TABLE 5. TOLERANT TURFGRASS SPECIES

COMMON NAME	SCIENTIFIC NAME
Bermudagrass	<i>Cynodon</i> spp.
Centipedegrass	<i>Eremochloa ophiuroides</i>
Seashore Paspalum	<i>Paspalum vaginatum</i>
St. Augustinegrass	<i>Stenotaphrum secundatum</i>
Zoysiagrass	<i>Zoysia</i> spp.

FOR THE MANAGEMENT OF UNDESIRABLE AQUATIC VEGETATION IN SLOW MOVING OR QUIESCENT WATERS

APPLICATOR & SPRAYER INFORMATION

Mixing Instructions

- Fill clean spray tank ½ full of desired level with water and add buffering agent if necessary.
- Add the required amount of Alligare FLUMIGARD Herbicide to the spray tank while agitating.
- Fill spray tank to desired level with water. Ensure that Alligare FLUMIGARD Herbicide is thoroughly mixed before making applications. Continue agitation until spray solution has been applied.
- Mix only the amount of spray solution that can be applied the day of mixing. Apply Alligare FLUMIGARD Herbicide within 12 hours of mixing.

ADDITIVES

When applying Alligare FLUMIGARD Herbicide to the foliage of floating or emerged aquatic weeds, mix with an adjuvant approved for use in aquatic sites. Mix Alligare FLUMIGARD Herbicide with a non-ionic surfactant containing at least 80% active ingredient. It is the pesticide user's responsibility to ensure that all products are registered for the intended use. Read and follow the applicable restrictions and limitations and directions for use on all product labels involved in tank mixing. Users must follow the most restrictive directions for use and precautionary statements of each product in the tank mixture. Verify mixing compatibility by a jar test before using.

Jar Test to Determine Compatibility of Adjuvants and Alligare FLUMIGARD Herbicide

Conduct a jar test before mixing commercial quantities of Alligare FLUMIGARD Herbicide, when using for the first time, when using new adjuvants or when a new water source is being used.

1. Add 1 pt of water to a quart jar. Use water from the same source and the same temperature as the water

used in the spray tank mixing operation.

2. Add 3 grams (approximately 1 level tsp) of Alligare FLUMIGARD Herbicide for the 8 oz/A rate or 4 grams (approximately 1-1/2 tsp) for 12 oz/A rate to the jar. Gently mix until product disperses.
3. Add 60 ml (4 Tbsp or 2 fl oz) of additive to the quart jar and gently mix.
4. Place cap on jar, invert 10 times, let stand for 15 minutes, evaluate.
5. An ideal tank mix combination will be uniform and free of suspended particles. If any of the following conditions are observed, question the choice of adjuvant:
 - a) Layer of oil or globules on the solution surface.
 - b) Flocculation: Fine particles in suspension or as a layer on the bottom of the jar.
 - c) Clabbering: Thickening texture (coagulated) like gelatin.

Sprayer Cleanup

If spray equipment is dedicated to application of aquatic herbicides, follow the following steps to clean the spray equipment:

- Completely drain the spray tank and rinse the application equipment thoroughly, including the inside and outside of the tank and all in-line screens.

If spray equipment will be used for purposes other than applying aquatic herbicides, it must be thoroughly cleaned following application of Alligare FLUMIGARD Herbicide. The following steps must be used to clean the spray equipment:

1. Completely drain the spray tank and rinse the application equipment thoroughly, including the inside and outside of the tank and all in-line screens.
2. Fill the tank with clean water and flush all hoses, booms, screens and nozzles.
3. Top off tank with clean water.
4. Circulate through sprayer for 5 minutes.
5. Then flush all hoses, booms, screens and nozzles for a minimum of 15 minutes.
6. Drain tank completely.
7. Remove all nozzles and screens and rinse them with clean water.

AERIAL APPLICATION

To obtain satisfactory weed control, aerial application of Alligare FLUMIGARD Herbicide must provide uniform coverage of surface weeds and sufficient contact time. When applied by air, Alligare FLUMIGARD Herbicide may not provide adequate control of some submersed weeds. Do not apply by air when significant drift on to non-target plants may occur or when wind velocity is more than 10 mph. Avoid spraying Alligare FLUMIGARD Herbicide within 200 feet of dwellings, adjacent sensitive crops or environmentally sensitive areas. To obtain satisfactory application and avoid drift, the following direction must be observed:

- Volume Pressure

Apply Alligare FLUMIGARD Herbicide in a minimum of 10 gals of water per acre with a maximum spray pressure of 40 PSI. Application at less than 5 gals per acre may not provide adequate weed control. Higher gallonage applications provide more consistent weed control.

- Nozzles and Nozzle Operation

Use nozzles that produce flat or hollow cone spray patterns. Use non-drip type nozzles to avoid unwanted discharge of spray solution. The nozzle must be directed toward the rear of the aircraft, at an angle between 0° and 15° downward. Do not place nozzles on the outer 25% of the wings or rotors.

- Adjuvants

Refer to the additive section or the tank mix partners label for adjuvant directions.

DIRECTIONS FOR USE TO CONTROL FLOATING AND EMERGED WEEDS USING SURFACE APPLICATION

Alligare FLUMIGARD Herbicide will control weeds and algae listed in Table 6, *Floating and Emerged Weeds*, when applied as a broadcast spray with appropriate equipment. For best results, apply Alligare FLUMIGARD Herbicide to the foliage of actively growing weeds.

TABLE 6. FLOATING AND EMERGED WEEDS

Common Name	Scientific Name
Alligator Weed	<i>Alternanthera philoxeroides</i>
Duckweed	<i>Lemna</i> spp.
Frog's-bit	<i>Limnobium spongia</i>
Water Fern	<i>Salvinia</i> spp.
Water Lettuce	<i>Pistia stratiotes</i>
Watermeal	<i>Wolffia</i> spp.
Water Pennywort	<i>Hydrocotyle</i> spp.
Filamentous algae	<i>Pithophora</i>
Filamentous algae	<i>Cladophora</i>

Surface Application

Apply Alligare FLUMIGARD Herbicide as a broadcast spray at 6 to 12 ounces of formulated product (0.19 to 0.38 lb ai) per acre plus an adjuvant approved for use in aquatics.

Alligare FLUMIGARD Herbicide is a contact herbicide that quickly degrades in the water column so plants that do not initially come in contact with the herbicide will not be controlled. Apply Alligare FLUMIGARD Herbicide in a minimum of 30 gals of water per acre to all areas of the water body where weeds exist. Coverage is essential for effective control as all floating weeds need to be exposed to lethal concentrations in all parts of the water body. Any untreated escapes or re-introductions of plants that were not treated will reestablish in areas where surface weeds had previously been controlled. If a second application is required to provide control, apply once the return of these weeds is first observed, but no sooner than 28 days after the last treatment.

Application of Alligare FLUMIGARD Herbicide during early morning hours may enhance weed control. When applying to densely packed actively growing surface weeds, ensure adequate coverage. Rapid decomposition of vegetation resulting from herbicide treatment can result in loss of oxygen in water. A sudden decrease in dissolved oxygen can result in fish suffocation. If aquatic vegetation is dense, treat floating surface weeds in sections to avoid a rapid decrease in dissolved oxygen.

Alligare FLUMIGARD Herbicide may be tank mixed with 2,4-D, diquat, glyphosate or other registered foliar applied herbicides for enhanced control of floating and emergent weeds.

Consult a manufacturer's label for specific rate restrictions and weeds controlled. It is the pesticide user's responsibility to ensure that all products are registered for the intended use. Read and follow the applicable restrictions and limitations and directions for use on all product labels involved in tank mixing. Users must follow the most restrictive directions for use and precautionary statements of each product in the tank mixture.

Application Equipment

Apply Alligare FLUMIGARD Herbicide with sprayers equipped with nozzles designed to deliver the desired spray pressure and spray volume. Apply by backpack or handgun sprayer, airboat, helicopter, airplane or other application equipment that will ensure thorough coverage of target plant foliage.

DIRECTIONS FOR USE TO CONTROL SUBMERSED AND FLOATING WEEDS USING SUBSURFACE APPLICATION

Alligare FLUMIGARD Herbicide will control submersed and floating weeds listed in Table 7, *Submersed and Floating Weeds Controlled by Subsurface Application*, when applied subsurface with appropriate equipment.

TABLE 7. SUBMERSED AND FLOATING WEEDS CONTROLLED BY SUBSURFACE APPLICATION

Common Name	Scientific Name
Coontail	<i>Ceratophyllum demersum</i>
Duckweed	<i>Lemna</i> spp.
Fanwort	<i>Cabomba caroliniana</i>
Hydrilla	<i>Hydrilla verticillata</i>
Hygrophila	<i>Hygrophila polysperma</i>
Naiad, Southern	<i>Najas guadalupensis</i>
Pondweed, Curlyleaf	<i>Potamogeton crispus</i>
Pondweed, Sago	<i>Potamogeton pectinatus</i>
Pondweed, Variable-Leaf	<i>Potamogeton diversifolius</i>
Water Fern	<i>Salvinia</i> spp.
Water Lettuce	<i>Pistia stratiotes</i>
Watermeal	<i>Wolffia</i> spp.
Watermilfoil, Eurasian	<i>Myriophyllum spicatum</i>
Watermilfoil, Variable-Leaf	<i>Myriophyllum heterophyllum</i>

Subsurface Application

Apply Alligare FLUMIGARD Herbicide at a rate that will produce an initial concentration of 200 to 400 ppb (of active ingredient flumioxazin) in the water column.

Alligare FLUMIGARD Herbicide is rapidly absorbed by target plants, but also breaks down quickly in water with a pH greater than 8.5. The pH of water surrounding mats of submersed vegetation can exceed 8.5 by early to mid-day, due to photosynthetic processes. Application of Alligare FLUMIGARD Herbicide under these conditions may provide only partial weed control, and regrowth is likely. For best control, apply Alligare FLUMIGARD Herbicide in a minimum of 30 gals of water per acre in the early morning to actively growing weeds and early in the season before surface matting occurs. Complete coverage and sufficient contact time of submersed weeds with Alligare FLUMIGARD Herbicide is required for optimal performance. Application of Alligare FLUMIGARD Herbicide with subsurface trailing hoses designed to distribute the herbicide within the plant stand will provide more effective and longer term control of submersed weeds. Use Table 8, *Subsurface Application Rates* to determine the amount of Alligare FLUMIGARD Herbicide needed to achieve desired concentration at different water depths. Use higher concentrations when weed biomass is heavy and/or weeds are more mature and topped out. Any untreated plants that are left in the water column can re-infest treated areas that had been previously controlled. If a second application is required to provide control, make the treatment once the return of these weeds is first observed, but no sooner than 28 days after the last treatment.

When applying Alligare FLUMIGARD Herbicide to densely packed actively growing submersed weeds, a rapid decomposition of vegetation resulting from herbicide treatment can result in loss of oxygen in water. A sudden decrease in dissolved oxygen can result in fish suffocation. If aquatic vegetation is dense, treat submersed weeds in sections to avoid a rapid decrease in dissolved oxygen.

Alligare FLUMIGARD Herbicide may be tank mixed with other registered submersed applied herbicides for enhanced control of submersed and floating weeds. It is the pesticide user's responsibility to ensure that all products are registered for the intended use. Read and follow the applicable restric-

tions and limitations and directions for use on all product labels involved in tank mixing. Users must follow the most restrictive directions for use and precautionary statements of each product in the tank mixture.

Application Equipment

To improve distribution in the water column and ensure adequate coverage apply Alligare FLUMIGARD Herbicide with subsurface trailing hoses in order to place the herbicide under the surface and throughout the biomass of aquatic vegetation. Keep swath width to a minimum in order to maximize contact with submersed aquatic vegetation.

Information on Hydrilla Control in Florida

Apply Alligare FLUMIGARD Herbicide as a subsurface treatment for hydrilla control. For best control of hydrilla apply during the late Winter/early Spring and/or early to late Fall. Efficacy of Alligare FLUMIGARD Herbicide will be enhanced at these timings due to lower potential biomass present and lower pH of the water. If applied to mature topped out hydrilla, Alligare FLUMIGARD Herbicide will cause some discoloration and loss of growing tips, but regrowth will be rapid.

Tank mixing Alligare FLUMIGARD Herbicide with other registered herbicides is suggested, especially if hydrilla is approaching maturity or biomass is heavy.

TABLE 8. SUBSURFACE APPLICATION RATES

Water Depth (feet)	Pounds of Alligare FLUMIGARD Herbicide Required Per Surface Acre to Achieve Desired Water Concentration		
	200 ppb	300 ppb	400 ppb
1	1.1	1.6	2.1
2	2.1	3.2	4.2
3	3.2	4.8	6.4
4	4.2	6.4	8.5
5	5.3	8.0	10.6
6	6.4	9.5	12.7
7	7.4	11.1	14.8

Example: to achieve an initial concentration of 200 ppb of flumioxazin in a 4 foot deep water column, apply 4.2 lbs of Alligare FLUMIGARD Herbicide per surface acre.

STORAGE AND DISPOSAL

STORAGE: Keep pesticide in original container. Store in a cool, dry, secure place. Do not put formulation or dilute spray solution into food or drink containers. Do not store or transport near feed or food. Not for use or storage in or around the home. Do not contaminate water, food or feed by storage, disposal or cleaning equipment.

PESTICIDE DISPOSAL: Waste resulting from the use of this product may be disposed of on site or at an approved waste disposal facility.

CONTAINER HANDLING:

Nonrefillable container. Do not reuse or refill this container. Offer for recycling, if available. Triple rinse container (or equivalent) promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank. Fill the container $\frac{1}{4}$ full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. Then offer for recycling, if available or puncture and dispose of in a sanitary landfill.

CONDITION OF SALE AND LIMITATION OF WARRANTY AND LIABILITY

To the extent consistent with applicable law, upon purchase or use of this product, purchaser and user agree to the following terms:

Warranty: Alligare, LLC (the Company) warrants that this product conforms to the chemical description on the label in all material respects and is reasonably fit for the purpose referred to in the directions for use, subject to the exceptions noted below, which are beyond the Company's control. To the extent consistent with applicable law, the Company makes no other representation or warranty, express or implied, concerning the product, including no implied war-

ranty of merchantability or fitness for a particular purpose. To the extent consistent with applicable law, no such warranty shall be implied by law, and no agent or representative is authorized to make any such warranty on the Company's behalf.

Terms of Sale: The Company's directions for use of this product must be followed carefully. It is impossible to eliminate all risks inherently associated with use of this product. Crop injury, ineffectiveness or other unintended consequences may result because of such factors as weather conditions, presence of other materials, and the manner of use or application (including failure to adhere to label directions), all of which are beyond the Company's control. To the extent consistent with applicable law, all such risks are assumed by the user.

Limitation of Liability: To the extent consistent with applicable law, the exclusive remedy against the Company for any cause of action relating to the handling or use of this product is a claim for damages, and in no event shall damages or any other recovery of any kind exceed the price of the product which caused the alleged loss, damage, injury or other claim. To the extent consistent with applicable law, under no circumstances shall the Company be liable for any special, indirect, incidental or consequential damages of any kind, including loss of profits or income. Some states do not allow the exclusion or limitation of incidental or consequential damages.

The Company and the seller offer this product, and the purchaser and user accept this product, subject to the foregoing warranty, terms of sale and limitation of liability, which may be varied or modified only by an agreement in writing signed on behalf of the Company by an authorized representative.

FLUMIGARD™ is a trademark of ADAMA group company.

EPA 20180928



FLUMIGARD™

Herbicide

FOR USE IN CONTAINER AND FIELD GROWN CONIFERS (INCLUDING CHRISTMAS TREES) AND DECIDUOUS TREES, AROUND ESTABLISHED WOODY ORNAMENTALS IN LANDSCAPES, TO MAINTAIN BARE GROUND NON-CROP AREAS, CONIFER AND POPLAR RE-FORESTATION SITES*, AND DORMANT TURFGRASS, FOR THE MANAGEMENT OF UNDESIRABLE AQUATIC VEGETATION IN SLOW MOVING OR QUIESCENT WATERS (TO CONTROL FLOATING AND EMERGED WEEDS USING SURFACE AND SUBSURFACE APPLICATIONS)

*Not approved for use in conifer and poplar re-forestation sites in California.

ACTIVE INGREDIENT:	By Wt
Flumioxazin*	51.0%
OTHER INGREDIENTS:	49.0%
TOTAL:	100.0%
*(2-[7-fluoro-3,4-dihydro-3-oxo-4-(2-propynyl)-2H-1,4-benzoxazin-6-yl]-4,5,6,7-tetrahydro-1H-indole-1,3(2H)-dione)	

Alligare FLUMIGARD™ Herbicide is a water dispersible granule containing 51% active ingredient.

EPA Reg. No. 81927-68 EPA Est. No. 81927-AL-001^{PM}; 37429-GA-001^{BT}
Letter(s) in lot number correspond(s) to superscript in EPA Est. No.

KEEP OUT OF REACH OF CHILDREN CAUTION

PRECAUTIONARY STATEMENTS HAZARDS TO HUMANS AND DOMESTIC ANIMALS CAUTION

Harmful if inhaled or absorbed through the skin. Causes moderate eye irritation. Avoid breathing dust and spray mist. Avoid contact with skin, eyes or clothing. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, or using tobacco. Remove and wash contaminated clothing before reuse.

Manufactured for: Alligare, LLC
1565 5th Avenue • Opelika, AL 36801

Net Weight: 5 lbs.

FLUMIOXAZIN GROUP 14 HERBICIDE

FIRST AID

If inhaled: Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth, if possible. Call a poison control center or doctor for further treatment advice.

If on skin or clothing: Take off contaminated clothing. Rinse skin immediately with plenty of water for 15 to 20 minutes. Call a poison control center or doctor for treatment advice.

If in eyes: Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for treatment advice.

If swallowed: Call a poison control center or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by a poison control center or doctor. Do not give anything by mouth to an unconscious person.

HOT LINE NUMBER: Have the product container or label with you when calling a poison control center or doctor, or going for treatment. You may also contact 1-800-424-9300 for emergency medical treatment information.

STORAGE AND DISPOSAL

STORAGE: Keep pesticide in original container. Store in a cool, dry, secure place. Do not put formulation or dilute spray solution into food or drink containers. Do not store or transport near feed or food. Not for use or storage in or around the home. Do not contaminate water, food or feed by storage, disposal or cleaning equipment.

PESTICIDE DISPOSAL: Waste resulting from the use of this product may be disposed of on site or at an approved waste disposal facility.

CONTAINER HANDLING:

Nonrefillable container. Do not reuse or refill this container. Offer for recycling, if available. Triple rinse container (or equivalent) promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank. Fill the container ¼ full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. Then offer for recycling, if available or puncture and dispose of in a sanitary landfill.

See inside label booklet for additional Precautionary Statements
and Directions for Use.

EPA 20180928

PEEL BACK BOOK HERE



FLURIDONE

An herbicide for management of aquatic vegetation in fresh water ponds, lakes, reservoirs, potable water sources, drainage canals and irrigation canals.

ACTIVE INGREDIENT:

Fluridone: 1-methyl-3-phenyl-5-[3-(trifluoromethyl)phenyl]-4(1*H*)-pyridinone 41.7%

OTHER INGREDIENTS: 58.3%

TOTAL: 100.0%

Contains 4 pounds active ingredient per gallon.

EPA Reg. No. 81927-45 EPA Est. No. 81927-AL-001^{PM}

89332-GA-001^{MC}; 42750-MO-001^{ALB}

86088-PA-001^{CMC}

Letter(s) in lot number correspond(s) to superscript in EPA Est. No.

**KEEP OUT OF REACH OF
CHILDREN**

**CAUTION /
PRECAUCIÓN**

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand this label, find someone to explain it to you in detail.)

Alligare Fluridone contains fluridone, the same active ingredient found in Sonar® A.S. and Avast!® SC Aquatic herbicide.

Avast! SC and Sonar® A.S. are registered trademarks of SePRO Corp.

Alligare Fluridone is not manufactured or distributed by SePRO Corp., the manufacturer and seller of Sonar® A.S. and Avast!® SC.

Manufactured for:

Alligare, LLC
1565 5th Avenue
Opelika, AL 36801

Net Contents: 2.5 Gallons (9.46 liters)

FIRST AID

If in eyes:	• Hold eye open and rinse slowly and gently with water for 15-20 minutes. • Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. • Call a poison control center or doctor for treatment advice.
If on skin or clothing:	• Take off contaminated clothing. • Rinse skin immediately with plenty of water for 15-20 minutes. • Call a poison control center or doctor for treatment advice.
If swallowed:	• Immediately call a poison control center or doctor for treatment advice. • Have person sip a glass of water if able to swallow. • Do not induce vomiting unless told to do so by the poison control center or doctor. • Do not give anything by mouth to an unconscious person.
If inhaled:	• Move person to fresh air. • If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth to mouth if possible. • Call a poison control center or doctor for further treatment advice.

HOT LINE NUMBER

Have the product container or label with you when calling a poison control center or doctor, or going for treatment. You may also contact 1-800-424-9300 for emergency medical treatment information.

See inside label booklet for Precautionary Statements and Directions for Use including Storage and Disposal instructions.

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**PRECAUTIONARY STATEMENTS
HAZARDS TO HUMANS AND DOMESTIC ANIMALS
CAUTION / PRECAUCION**

Harmful if swallowed, absorbed through skin, or if inhaled. Causes moderate eye irritation. Avoid breathing of spray mist. Avoid contact with skin, eyes, or clothing. Wash thoroughly with soap and water after handling. Remove contaminated clothing and wash before reuse.

ENVIRONMENTAL HAZARDS

Follow use directions carefully so as to minimize adverse effects on nontarget organisms. Do not contaminate water when disposing of equipment washwaters. Trees, turf, and shrubs growing in water treated with Alligare Fluridone may occasionally develop chlorosis. Do not apply in tidewater/brackish water. Lowest rates should be used in shallow areas where the water depth is considerably less than the average depth of the entire treatment site, for example, shallow shoreline areas.

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling. Read all Directions for Use carefully before applying.

Shake well before using.

STORAGE AND DISPOSAL

Do not contaminate water, food or feed by storage or disposal.

PESTICIDE STORAGE: Store in original container only. Do not store near feed or foodstuffs. In case of leak or spill, use absorbent materials to contain liquids and dispose as waste.

PESTICIDE DISPOSAL: Wastes resulting from use of this product must be used according to label directions or disposed of at an approved waste disposal facility.

CONTAINER HANDLING: Nonrefillable container. Do not reuse or refill this container. Triple rinse container (or equivalent) promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container ¼ full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. Then offer for recycling if available or puncture and dispose of in a sanitary landfill, or by incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.

PRODUCT INFORMATION

Alligare Fluridone is a selective translocated aquatic herbicide. Applied to freshwater ponds, lakes, reservoirs, drainage canals and irrigation canals (including dry or dewatered areas of these sites), Alligare Fluridone helps manage undesirable aquatic weeds. Susceptible aquatic vascular plants absorb the product through the shoots and roots. For effective control, contact of this product with the target plants must be maintained for at least 45 days. Effective control is reduced if conditions exist that dilute the concentration of this product in the water.

The mode of action of Alligare Fluridone involves inhibition of carotene synthesis in the target weeds. Lack of carotene in plants causes the chlorophyll to break down when the plants are exposed to sunlight. New shoot growth on target weeds begins to turn chlorotic (white) or pink in color within 7 to 10 days of exposure to Alligare Fluridone. Ideally, 30 to 90 days of continuous exposure to this product will provide optimum control of target weeds. Some plant species may not be controlled by this product under all conditions. Factors affecting herbicide performance include growth stage of the target weed, the time of year when Alligare Fluridone is applied, and dilution or movement of treated water.

Optimum results are achieved when this product is applied before weeds begin to actively grow.

For mature plants, the higher application rates will be required and effects due to Alligare Fluridone treatment will take longer to observe.

A suitable analysis of the water to determine the concentration of this product is highly recommended. The most common method of water analysis for measuring fluridone concentrations which is recommended by Alligare, LLC is the Enzyme-Linked Immunoassay (ELISA Test). Contact Alligare, LLC for information on this test when using this product in treatment programs.

Application rates are shown in fluid ounces or quarts of this product to achieve a desired concentration of the active ingredient in parts per billion by weight (ppbw).

PRECAUTIONS

- **Permits:** Consult with appropriate state or local water authorities before applying this product since state or local agencies may require permits to use Alligare Fluridone.
- **Chemigation:** Do not apply this product through any type of irrigation system.
- **Hydroponic Farming:** Do not use Alligare Fluridone treated water for hydroponic farming.
- **Greenhouse and Nursery Plants:** Do not use water which has been treated with this product to irrigate greenhouse or nursery plants unless chemical assays of the water indicate fluridone residues are less than one part per billion (ppb).
- **Maximum Use Rates:** Do not apply more than a total of 90 ppb in ponds and 150 ppb in lakes and reservoirs per annual growth cycle. These maximum concentrations are the amounts of fluridone calculated as the target application rate, NOT the concentration determined by analysis of fluridone in the treated water.
- **Waiting Periods:** If application rates are 150 ppb or less, treated water may be used immediately with no waiting period for drinking (potable) water (including watering livestock and pets), fishing or swimming. See specific restrictions below for Potable Water Intakes and Irrigation.
- **Potable Water Intakes:** In lakes and reservoirs or other sources of potable water, **DO NOT APPLY** this product at application rates greater than 20 ppb within 1/4 mile (1320 feet) of any functioning potable water intake. If rates are between 6 and 20 ppb, this product **MAY BE APPLIED** where functioning potable water intakes are present.
Note: Existing potable water intakes which are no longer in use, such as those replaced by potable water wells or connections to a municipal water system, are not considered to be functioning potable water.
- **Irrigation:** Irrigation using water treated with this product may injure the irrigated vegetation. Instruct those who use Alligare Fluridone treated water to follow the recommended waiting periods listed in the table below and to assay the water for fluridone residues. For crops grown on low organic and sandy soils and irrigated with Alligare Fluridone treated water, the potential for crop injury is greater than for crops grown on heavier soils.

If a shorter waiting period is desired for irrigation of crops using Alligare Fluridone treated water, use a suitable analysis (ELISA or other methods) to measure the concentration of fluridone in the treated water. If the concentration of fluridone is less than 10 ppb, established tree crops, established row crops or turf can be irrigated with Alligare Fluridone treated water.

If the concentrations of fluridone are greater than 5 ppb, tobacco, tomatoes, peppers or other plants within the *Solanaceae* Family and newly seeded crops or newly seeded grasses such as over-seeded golf course greens should NOT be irrigated with Alligare Fluridone treated water. Rotation Crops: Do not plant members of the *Solanaceae* family on land that has been previously irrigated with water containing more than 5 ppb of fluridone. Consult an aquatic specialist prior to commencing irrigation of such sites.

Application Sites	Number of Days to Wait after Alligare Fluridone Application Before Irrigating with Alligare Fluridone treated Water		
	Established Tree Crops	Established Row Crops/ Turf/Plants	Newly Seeded Crops/ Seedbed or Areas To be Planted Including Overseeded Golf Course Greens
Ponds and Static Canals*	7	30	Assay required
Canals	7	14	Assay required
Lakes and Reservoirs*	7	14	Assay required
Dry or Dewatered Canals*	0	0	*

***Ponds:** For Alligare Fluridone labeling purposes, a pond is defined as a body of water 10 acres or less in size.

***Lakes or Reservoirs:** For Alligare Fluridone labeling purposes, a lake or reservoir is defined as greater than 10 acres in size. When only one-half or more of the lake or reservoir is treated, follow the Pond and Static Canal precautions. In lakes and reservoirs where one-half or greater of the body of the water is treated, use the pond and static canal irrigation precautions. When applying this product to exposed sediments of aquatic sites such as lakes and reservoirs, follow these time frames prior to using water for irrigation once sites are reflooded.

*When this product is applied to exposed sediments of dry or dewatered canals, allow canals to refill for a minimum of 24 hours before using water for irrigation.

AQUATIC PLANT INFORMATION

Depending on the use rate, water movement, application timing, weed growth stage and application method, this product will control, partially control, or will not control certain aquatic plant species. The table below categorizes the species when this product is applied under ideal application conditions at higher to maximum label rates. When lower rates are used, certain species in the controlled or partially controlled categories will show increased tolerance to this product. Aquatic plants not listed may also be controlled, partially controlled, or be tolerant to Alligare Fluridone.

Before applying this product, identify the aquatic plants to determine their susceptibility to Alligare Fluridone.

Vascular Aquatic Plants Controlled by Alligare Fluridone

Floating Plants	Submersed Plants
common duckweed (<i>Lemna minor</i>)	bladderwort (<i>Utricularia</i> spp.)
	common coontail (<i>Ceratophyllum demersum</i>)
Emerald Plants	common elodea (<i>Elodea canadensis</i>)
spatterdock (<i>Nuphar luteum</i>)	egeria, Brazilian elodea (<i>Egeria densa</i>)
water-lily (<i>Nymphaea</i> spp.)	fanwort, cabomba (<i>Cabomba caroliniana</i>)
	hydrilla (<i>Hydrilla verticillata</i>)
Shoreline Grasses	naiad (<i>Najas</i> spp.)
paragrass (<i>Urochloa mutica</i>)	pondweed (<i>Potamogeton</i> spp., except Illinois pondweed)
	watermilfoil (<i>Myriophyllum</i> spp., except variable-leaf milfoil)
	Widgeon grass* (<i>Ruppia maritima</i>)

*Not approved for this use in California.

Vascular Aquatic Plants Partially Controlled by Alligare Fluridone

Floating Plants
common watermeal (<i>Wolffia columbiana</i>)*
Emerald Plants
alligatorweed (<i>Alternanthera philoxeroides</i>)
American lotus (<i>Nelumbo lutea</i>)
cattail (<i>Typha</i> spp.)
creeping waterprimrose (<i>Ludwigia peploides</i>)
parrotfeather (<i>Myriophyllum aquaticum</i>)
smartweed (<i>Polygonum</i> spp.)
spikerush (<i>Eleocharis</i> spp.)
waterpurslane (<i>Ludwigia palustris</i>)
watershield (<i>Brasenia schreberi</i>)
Submersed Plants
Illinois pondweed (<i>Potamogeton illinoensis</i>)
limnophila (<i>Limnophila sessiliflora</i>)
tapeggrass
American eelgrass (<i>Vallisneria spiralis</i>)
watermilfoil-variable-leaf milfoil (<i>Myriophyllum heterophyllum</i>)
Shoreline Grasses
barnyardgrass (<i>Echinochloa crusgalli</i>)
giant cutgrass (<i>Zizaniopsis miliacea</i>)
reed canarygrass (<i>Phalaris arundinacea</i>)
southern watergrass (<i>Hydrochloa carolinensis</i>)
torpedograss (<i>Panicum repens</i>)

*Alligare Fluridone when used at the maximum use rate only provides partial control of this species.

Vascular Aquatic Plants Not Controlled by Alligare Fluridone*

Floating Plants	Shoreline Grasses
waterlettuce (<i>Pistia stratiotes</i>)	maidencane (<i>Panicum hemitomon</i>)
Emerald Plants	
American frogbit (<i>Limnobium spongia</i>)	
arrowhead (<i>Sagittaria</i> spp.)	
bacopa (<i>Bacopa</i> spp.)	
big floating heart, banana lily (<i>Nymphaea aquatica</i>)	
bulrush (<i>Scirpus</i> spp.)	
floating waterhyacinth (<i>Eichhornia crassipes</i>)	
pickerelweed, lanceleaf (<i>Pontederia</i> spp.)	
rush (<i>Juncus</i> spp.)	
water pennywort (<i>Hydrocotyle umbellata</i>)	

*Note: Alligare Fluridone does not control algae (*Chara*, *Nitella*, and single-cellular, colonial and filamentous species).

PREPARATION OF ALLIGARE FLURIDONE SPRAY SOLUTIONS

Determine the amount of area (acres) to be treated. Water depths in the treatment sites should also be known so that the correct application rate is selected.

Use the steps below to prepare spray mixtures of this product:

1. Be sure to shake well the containers of this product before adding to the spray tank during mixing and loading operations.
2. Add ½ to ¾ the required amount of water to the spray tank. Begin agitation of the spray mixture and continue agitation during the mixing operations.

3. Add the required amount of this product to the spray tank during the remainder of the mixing operation.
4. Continue agitation of the spray mixture during the herbicide application operation.

Make surface or subsurface applications using conventional spray equipment. Use weighted trailing hoses to apply this product near the surface of the hydrosol. Make applications with a spray volume of 5 to 100 gallons per acre. A metering system which mixes concentrated Alligare Fluridone with water and then introduces this slurry into the suction side of the application equipment may also be used.

Note: This product is not corrosive to application equipment.

Tank Mix Information

Tank mixes of this product with other aquatic herbicides and algacides may provide greater efficacy and broader weed control or plant selectivity. Refer to the label for the herbicide or algacide used as a tank mix with Alligare Fluridone for use directions, precautions, and restrictions.

DIRECTIONS FOR APPLICATION - PONDS

For additional application rate calculations, refer to the section How To Calculate Application Rates at the end of this label.

Average Water Depth of Treatment Site in Feet	Fluid Ounces (or Qts.) of Alligare Fluridone per Treated Acre To Achieve Desired Herbicide Concentration:	
	45 ppb	90 ppb
1	3.8 fl. oz. (0.12 qts.)	7.7 fl. oz. (0.24 qts.)
2	7.7 (0.24)	15.7 (0.49)
3	11.8 (0.37)	23.4 (0.73)
4	15.7 (0.49)	31.4 (0.98)
5	19.5 (0.61)	39.0 (1.22)
6	23.4 (0.73)	46.7 (1.46)
7	27.2 (0.85)	54.4 (1.70)
8	31.4 (0.98)	62.4 (1.95)
9	35.2 (1.1)	70.1 (2.19)
10	39.0 (1.22)	78.1 (2.44)
Application Directions		
Apply Alligare Fluridone to the entire surface area of the pond.		
Single Applications: Use the amount of this product listed to give 45 to 90 ppb fluridone in treated water. Higher rates should be used for dense weed infestations, for difficult-to-control species, and for smaller ponds (less than 5 acres in size and average water depths of less than 4 feet).		
Split or Multiple applications: Use when dilution of the treated water is likely to occur.		
Do not exceed 90 ppb per annual growth cycle.		

DIRECTIONS FOR APPLICATION – LAKES AND RESERVOIRS

This product may be used for treatment of both whole lakes and reservoirs and partial areas of lakes or reservoirs (bays and coves). Target weeds in partial lake and reservoir treatments which are at least 5 acres in size are more effectively treated with this product than smaller size areas. Smaller treatment areas (less than 5 acres) or narrow strips such as boat trails or shorelines may not produce satisfactory results as Alligare Fluridone may be diluted with untreated water. Due to a number of environmental factors, rate ranges are provided. Select the rates and application methods based on the specific goals of the aquatic plant management program at each different site.

Whole Lake or Reservoir Treatments (Limited or No Water Discharge)

Single Application to Whole Lakes or Reservoirs: Apply this product at an application rate of between 10 and 90 ppb. Consult the table below for the amount of this product required to achieve these concentrations in the treated water. Rates should be based on the goals of the aquatic plant management program.

If control of **Eurasian watermilfoil** and **curlyleaf pondweed** is desired or for greater plant selectivity, use an application rate lower in the range. For other plant species, contact an aquatic specialist to help determine when to choose lower application rate.

The higher rates within the rate range can be used when dense weed infestations are present or when treating hard-to-control weed species. Additional applications may be required to control more difficult-to-control species or when dilution of the treatment concentration has occurred such as from a heavy rainfall. If multiple applications are made, do not exceed 150 ppb (the sum of all applications) per annual growth cycle. Read the directions below on Split or Multiple Applications. For additional application rate calculations, refer to the section How To Calculate Application Rates at the end of this label.

Rates For Single Application of Alligare Fluridone

Average Water Depth at Treatment Site in Feet	Fluid Ounces (or Qts.) of Alligare Fluridone per Treated Acre To Achieve Desired Herbicide Concentration:	
	10 ppb	90 ppb
1	1.0 fl. oz. (0.03 qts.)	7.7 fl. oz. (0.24 qts.)
2	1.6 (0.05)	15.7 (0.49)
3	2.6 (0.08)	23.4 (0.73)
4	3.2 (0.11)	31.4 (0.98)
5	4.5 (0.14)	39.0 (1.22)
6	5.1 (0.16)	46.7 (1.46)
7	6.1 (0.19)	54.4 (1.70)
8	7.0 (0.22)	62.4 (1.95)
9	7.6 (0.24)	70.1 (2.19)
10	8.6 (0.27)	78.1 (2.44)
11	9.6 (0.30)	86.0 (2.68)
12	10.2 (0.32)	93.8 (2.93)
13	11.2 (0.35)	101.4 (3.17)
14	12.1 (0.38)	109.4 (3.42)
15	13.1 (0.41)	117.1 (3.66)
16	13.8 (0.43)	124.8 (3.90)
17	14.7 (0.46)	132.2 (4.15)
18	15.7 (0.49)	140.5 (4.39)
19	16.3 (0.51)	148.2 (4.63)
20	17.3 (0.54)	156.2 (4.88)

Split or Multiple Applications to Whole Lakes or Reservoirs: If the goal of the aquatic plant management program is to use the lowest effective rate and to maintain a low herbicide concentration for sufficient time to ensure efficacy and enhanced selectivity, split or multiple application programs are appropriate. However, water analyses using ELISA (or other analyses) must be carried out to ensure that the water is treated at an initial application rate of 6 to 50 ppb. Continue split applications to maintain a sufficient concentration of fluridone for a minimum of 45 days or longer. As with single applications, to **control Eurasian watermilfoil and curlyleaf pondweed and to provide greater plant selectivity, use an application rate lower in the rate range.** For other weed species, contact an aquatic specialist to help determine when to choose lower application rate.

A single application at no more than 20 ppb may be made to lakes or reservoirs containing functional potable water intakes within ¼ mile of these functioning potable water intakes. Do not apply more than 150 ppb (sum of all applications) per annual growth cycle.

Partial Lake or Reservoir Treatments

If the chance of dilution of Alligare Fluridone with untreated water is expected in partial lake or reservoir treatments, using split or multiple applications may extend the herbicide contact time with the target weeds. Use higher application rates and more frequent applications if the likelihood of untreated water diluting the Alligare Fluridone concentration in the treatment area is anticipated.

Refer to the table below for additional application instructions and for use rates. For additional application rate calculations, refer to the section How To Calculate Application Rates at the end of this label.

Partial Lake or Reservoir Treatment Site	Rates and Instructions
Treatment Areas Greater Than 1/4 Mile from a Functioning Potable Water Intake	Single applications: apply this product at 30 to 150 ppb. Split or multiple applications: Do not exceed 150 ppb (total of all applications) per annual growth cycle. If split applications are made, maintain a sufficient concentration in the target area for a period of 45 days or longer. Use the ELISA or other analyses to ensure that the desired concentration of fluridone is maintained over time.
Treatment Areas Within 1/4 Mile of a Functioning Potable Water Intake	One may apply a concentration of greater than 20 ppb if the application is made at least ¼ mile or more from the functioning potable water intake. Application rates of less than 20 ppb may be made with ¼ mile of the potable water intake but use ELISA or other methods to verify that the fluridone concentration do not exceed 150 ppb at the potable water intake.

Application to Sediments of Dry or Dewatered Aquatic Sites

For applications of Alligare Fluridone to sediments of dry or dewatered aquatic sites, including exposed sediments of lakes and reservoirs, irrigation canals, non-irrigation canals and drainage canals, apply a maximum of 2 quarts of this product per surface acre per annual growth cycle. Apply Alligare Fluridone evenly to the sediment surface, with a minimum spray solution of 30 to 100 gallons per surface acre. High levels of organic matter in treated sediments may reduce efficacy. Alligare Fluridone may be applied with other aquatic herbicides labeled for this use.

DIRECTIONS FOR APPLICATION – DRAINAGE CANALS AND IRRIGATION CANALS

For additional application rate calculations, refer to the section How To Calculate Application Rates at the end of this label.

Application Site	Rates and Instructions
Static Canals	1 – 2 quarts per treated acre
Moving Water Canals	Optimum performance will be achieved when water flow is restricted or reduced. For slowly moving bodies of water, apply using techniques that maintain the fluridone concentration at 15-40 ppb for at least 45 days. Use split or multiple broadcast applications (or metering methods) to ensure a uniform concentration of fluridone. Use the ELISA or other analyses to ensure that the desired concentration of fluridone is maintained over time.

Application Site	Rates and Instructions
Static or Moving Water Canals Containing a Functioning Potable Water Intake	One may apply a concentration of greater than 20 ppb Alligare Fluridone at least ¼ mile or greater from the functioning potable water intake. Application rates of less than 20 ppb may be made within ¼ mile of the potable water intake but use ELISA or other methods to verify that the fluridone concentration does not exceed 150 ppb at the potable water intake.

HOW TO CALCULATE APPLICATION RATES

Ponds, Lakes and Reservoirs: Use the calculation below to determine the amount in fluid ounces of this product to be applied per acre to provide the desired ppb concentration of fluridone in the treated water:

Fluid Ounces of Alligare Fluridone required per treated acre =
(Average water depth of treatment site in feet) x (desired ppb concentration of fluridone) x 0.0027 x 32

As an example, the calculation to determine the number of fluid ounces of this product needed to treat one acre for a herbicide concentration of 45 ppb fluridone at a site where the average water depth is 3 feet is shown as follows:

$3 \times 45 \times 0.0027 \times 32 = 11.7 \text{ fl. oz. per treated acre}$

Note: Fluid ounces can be converted to quarts by dividing the number of fluid ounces by 32. For example, $11.7 \text{ fl. oz.} \div 32 = 0.37 \text{ quarts}$.

Make sure that the calculated rate does not exceed the maximum allowable rate in pints (or quarts) per treated acre for the water depth listed in the application rate tables for the sites to be treated.

Moving Water Drainage and Irrigation Canals: Calculate the amount of this product in quarts required for the proposed application through a metering system to provide the desired ppb concentration of fluridone in the treated water as follows:

- Determine the Cubic Feet per Second as follows:
 $\text{CFS (cubic feet per second)} = \text{Average flow rate (feet per second)} \times \text{average canal width (ft.)} \times \text{average canal depth (ft.)} \times 0.9$
- Calculate the Water Movement in Acre-Feet per Day:
 $\text{Water movement in acre-feet per day} = \text{CFS} \times 1.98$
- Amount of Alligare Fluridone required:
 $\text{Acre-feet per day} \times \text{desired ppb} \times 0.0027 = \text{Quarts of Alligare Fluridone required per day}$

CONDITION OF SALE AND LIMITATION OF WARRANTY AND LIABILITY

To the extent consistent with applicable law, upon purchase or use of this product, purchaser and user agree to the following terms:

Warranty: Alligare, LLC (the Company) warrants that this product conforms to the chemical description on the label in all material respects and is reasonably fit for the purpose referred to in the directions for use, subject to the exceptions noted below, which are beyond the Company's control. To the extent consistent with applicable law, the Company makes no other representation or warranty, express or implied, concerning the product, including no implied warranty of merchantability or fitness for a particular purpose. To the extent consistent with applicable law, no such warranty shall be implied by law, and no agent or representative is authorized to make any such warranty on the Company's behalf.

Terms of Sale: The Company's directions for use of this product must be followed carefully. It is impossible to eliminate all risks inherently associated with use of this product. Crop injury, ineffectiveness or other unintended consequences may result because of such factors as weather conditions, presence of other materials, and the manner of use or

application (including failure to adhere to label directions), all of which are beyond the Company's control. To the extent consistent with applicable law, all such risks are assumed by the user.

Limitation of Liability: To the extent consistent with applicable law, the exclusive remedy against the Company for any cause of action relating to the handling or use of this product is a claim for damages, and in no event shall damages or any other recovery of any kind exceed the price of the product which caused the alleged loss, damage, injury or other claim. To the extent consistent with applicable law, under no circumstances shall the Company be liable for any special, indirect, incidental or consequential damages of any kind, including loss of profits or income. Some states do not allow the exclusion or limitation of incidental or consequential damages.

The Company and the seller offer this product, and the purchaser and user accept this product, subject to the foregoing warranty, terms of sale and limitation of liability, which may be varied or modified only by an agreement in writing signed on behalf of the Company by an authorized representative.

EPA 20160614



FLURIDONE

An herbicide for management of aquatic vegetation in fresh water ponds, lakes, reservoirs, potable water sources, drainage canals and irrigation canals.

PEEL BACK BOOK HERE

ACTIVE INGREDIENT:

Fluridone: 1-methyl-3-phenyl-5-[3-(trifluoromethyl)phenyl]-4(1*H*)-pyridinone 41.7%

OTHER INGREDIENTS: 58.3%

TOTAL: 100.0%

Contains 4 pounds active ingredient per gallon.

EPA Reg. No. 81927-45

EPA Est. No. 81927-AL-001^{PM}

89332-GA-001^{MC}; 42750-MO-001^{ALB}

86088-PA-001^{CMC}

Letter(s) in lot number correspond(s) to superscript in EPA Est. No.

KEEP OUT OF REACH OF CHILDREN CAUTION / PRECAUCIÓN

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand this label, find someone to explain it to you in detail.)

FIRST AID

If in eyes:	• Hold eye open and rinse slowly and gently with water for 15-20 minutes. • Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. • Call a poison control center or doctor for treatment advice.
If on skin or clothing:	• Take off contaminated clothing. • Rinse skin immediately with plenty of water for 15-20 minutes. • Call a poison control center or doctor for treatment advice.

Manufactured for:

Alligare, LLC
1565 5th Avenue
Opelika, AL 36801

If swallowed:	• Immediately call a poison control center or doctor for treatment advice. • Have person sip a glass of water if able to swallow. • Do not induce vomiting unless told to do so by the poison control center or doctor. • Do not give anything by mouth to an unconscious person.
If inhaled:	• Move person to fresh air. • If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth to mouth if possible. • Call a poison control center or doctor for further treatment advice.

HOT LINE NUMBER

Have the product container or label with you when calling a poison control center or doctor, or going for treatment. You may also contact 1-800-424-9300 for emergency medical treatment information.

PRECAUTIONARY STATEMENTS HAZARDS TO HUMANS AND DOMESTIC ANIMALS CAUTION / PRECAUCIÓN

Harmful if swallowed, absorbed through skin, or if inhaled. Causes moderate eye irritation. Avoid breathing of spray mist. Avoid contact with skin, eyes, or clothing. Wash thoroughly with soap and water after handling. Remove contaminated clothing and wash before reuse.

STORAGE AND DISPOSAL

Do not contaminate water, food or feed by storage or disposal.

PESTICIDE STORAGE: Store in original container only. Do not store near feed or foodstuffs. In case of leak or spill, use absorbent materials to contain liquids and dispose as waste.

PESTICIDE DISPOSAL: Wastes resulting from use of this product must be used according to label directions or disposed of at an approved waste disposal facility.

CONTAINER HANDLING: Nonrefillable container. Do not reuse or refill this container. Triple rinse container (or equivalent) promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container ¼ full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. Then offer for recycling if available or puncture and dispose of in a sanitary landfill, or by incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.

See inside label booklet for Precautionary Statements and Directions for Use.

Net Contents: 2.5 Gallons (9.46 liters)

EPA 20160614



IMOX™

HERBICIDE

A herbicide for the selective management of undesirable vegetation in and around aquatic sites and terrestrial non-crop areas, industrial sites and rights-of-ways. The herbicide may be used on listed sites that are cut for hay or grazed.

ACTIVE INGREDIENT:

Ammonium salt of imazamox* 12.1%

OTHER INGREDIENTS: 87.9%**TOTAL:** 100.0%

*Equivalent to 11.4% imazamox acid

Contains 1 pound of imazamox acid equivalent (ae) per gallon.

EPA Reg. No. 81927-66

EPA Est. No. 37429-GA-001^{BT}
81927-AL-001^{PM}Letter(s) in lot number correspond(s)
to superscript in EPA Est. No.

KEEP OUT OF REACH OF CHILDREN

CAUTION/PRECAUCION

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand the label, find someone to explain it to you in detail.)

PRECAUTIONARY STATEMENTS HAZARDS TO HUMANS AND DOMESTIC ANIMALS CAUTION

Harmful if absorbed through skin or inhaled. Causes moderate eye irritation. Avoid breathing spray mist. Avoid contact with skin, eyes or clothing.

Manufactured for:
Alligare, LLC
1565 5th Avenue
Opelika, AL 36801

Net Contents: 2.5 Gallons (9.46 liters)**FIRST AID**

If on skin or clothing:	• Take off contaminated clothing. • Rinse skin immediately with plenty of water for 15 to 20 minutes. • Call a poison control center or doctor for treatment advice.
If in eyes:	• Hold eyes open and rinse slowly and gently with water for 15 to 20 minutes. • Remove contact lenses, if present, after the first 5 minutes; then continue rinsing eyes. • Call a poison control center or doctor for treatment advice.
If inhaled:	• Move person to fresh air. • If person is not breathing, call 911 or an ambulance; then give artificial respiration, preferably mouth to mouth if possible. • Call a poison control center or doctor for further treatment advice.

HOT LINE NUMBER

Have the product container or label with you when calling a poison control center or doctor or going for treatment. You may also contact 1-800-424-9300 for emergency medical treatment information.

See label booklet for additional Precautionary Statements and Directions for Use.

EPA 20200918



PERSONAL PROTECTIVE EQUIPMENT (PPE)

Applicators and other handlers must wear:

- Long-sleeved shirt and long pants
- Chemical-resistant gloves such as barrier laminate, butyl rubber ≥ 14 mils, nitrile rubber ≥ 14 mils, neoprene rubber ≥ 14 mils, natural rubber (includes natural rubber blends and laminates) ≥ 14 mils, polyethylene, polyvinyl chloride (PVC) ≥ 14 mils, or viton ≥ 14 mils
- Shoes plus socks

Follow manufacturer's instructions for cleaning and maintaining PPE. If no such instructions for washables exist, use detergent and hot water. Keep and wash PPE separately from other laundry.

USER SAFETY RECOMMENDATIONS

User should:

- Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet.
- Remove clothing/PPE immediately if pesticide gets inside. Then wash thoroughly and put clean clothing.
- Remove PPE immediately after handling this product. Wash the outside of the gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

ENVIRONMENTAL HAZARDS

This pesticide may be hazardous to plants outside the treated area. Do not apply to water except as specified in this label. Do not contaminate water when disposing of equipment washwater and rinsate.

NON-TARGET ORGANISM ADVISORY STATEMENT: This product is toxic to plants and may adversely impact the forage and habitat of non-target organisms, including pollinators, in areas adjacent to the treated site. Protect the forage and habitat of non-target organisms by following label directions intended to minimize spray drift.

GROUNDWATER ADVISORY STATEMENT: This chemical has properties and characteristics associated with chemicals detected in groundwater. This chemical may leach into groundwater if used in areas where soils are permeable, particularly where the water table is shallow.

SURFACE WATER ADVISORY STATEMENT: This product may impact surface water quality due to runoff of rain water. This is especially true for poorly draining soils and soils with shallow ground water. This product is classified as having high potential for reaching surface water via runoff for several months or more after application.

A level, well-maintained vegetative buffer strip between areas to which this product is applied and surface water features such as ponds, streams, and springs will reduce the potential of imazamox from runoff water and sediment. Runoff of this product will be reduced by avoiding applications when rainfall or irrigation is expected to occur within 48 hours.

PHYSICAL OR CHEMICAL HAZARDS

Do not mix or allow coming in contact with oxidizing agents. Hazardous Chemical Reaction may occur.

DIRECTIONS FOR USE

It is a violation of federal law to use this product in a manner inconsistent with its labeling. This labeling must be in the possession of the user at the time of pesticide application.

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your state or tribe, consult the agency responsible for pesticide regulation.

Read the entire label before using **Alligare IMOX™ Herbicide**. Consult your State Agricultural Experimental Station or Extension Service Specialist for additional information on application timing, rates and any additional requirements or restrictions.

DO NOT apply **Alligare IMOX Herbicide** in any manner not specifically described in this label.

Endangered Plant Species

To prevent potential negative impacts to endangered plant species, **DO NOT** apply **Alligare IMOX Herbicide** in a way that adversely affects federally listed endangered and threatened species.

PRODUCT INFORMATION

Alligare IMOX Herbicide is a water miscible concentrate designed to mix with water to form a solution. It may be diluted with water or applied directly to aquatic sites for selective vegetation management of susceptible aquatic vegetation or diluted and applied as a broadcast or spot spray to control target floating and emergent terrestrial and riparian vegetation.

Aquatic sites include: arroyos, bayous, canals and irrigation canals, creeks, ditches, estuarine sites, marine sites, lakes, marshes, ponds, reservoirs, rivers, slow-moving or quiescent bodies of water, streams, swamps and wetlands. The sites listed above may be treated with **Alligare IMOX Herbicide** during drawdown conditions.

Alligare IMOX Herbicide may also be applied for terrestrial and riparian vegetation control in industrial noncropland sites, and railroad, utility, and highway rights-of-way. Industrial noncropland sites include utility plant sites, tank farms, pumping installations, storage areas, fence rows and ditch banks. **Alligare IMOX Herbicide** may also be used for the establishment and maintenance of wildlife openings. The sites listed above and treated with **Alligare IMOX Herbicide** may be grazed or cut for hay.

Alligare IMOX Herbicide is an imidazolinone class herbicide that works by inhibition of acetolactate synthase (ALS) enzyme. **Alligare IMOX Herbicide** is quick to act by absorption and translocation into the foliage and/or roots, thus inhibiting plant growth. Once target plant growth is inhibited, leaves and growing points begin to discolor, followed by plant death or severe growth inhibition.

Many factors such as application rate, weed species, weed pressure, conditions of weeds including size and climatic factors impact the degree of weed control. Applications made to actively growing weeds at the early stages of development will optimize performance.

Alligare IMOX Herbicide is effective for the control/suppression of common problematic submersed, emergent and floating broadleaf and monocot aquatic vegetation. The degree of control and selectivity can be managed by timing, use rates, and application technique.

Specific use directions will be found in the following sections below:

- Terrestrial Sites
 - Foliar Broadcast Application
 - Foliar Spot Treatment Application
 - Injection (Hack and Squirt), Frill and Girdle, and Cut Stump application
 - Basal Application
- Aquatic Sites
 - Water Application to Submersed, Emergent and Floating Vegetation
 - Foliar Application to Emergent and/or Floating Vegetation
 - Aerial Application
 - Drawdown Application

RESISTANCE MANAGEMENT RECOMMENDATIONS

For resistance management, **Alligare IMOX Herbicide** is a Group 2 herbicide. Any weed population may contain or develop plants naturally resistant to **Alligare IMOX Herbicide** and other Group 2 herbicides. Weed species with acquired resistance to Group 2 herbicides may eventually dominate the weed population if Group 2 herbicides are used repeatedly in the same field or in successive years as the primary method of control for targeted species. This may result in partial or total loss of control of those species by **Alligare IMOX Herbicide** or other Group 2 herbicides.

Suspected herbicide-resistant weeds may be identified by these indicators:

- ❑ Failure to control a weed species normally controlled by the herbicide at the dose applied, especially if control is achieved on adjacent weeds;
- ❑ A spreading patch of non-controlled plants of a particular weed species; and
- ❑ Surviving plants mixed with controlled individuals of the same species.

To delay herbicide resistance:

- ❑ Avoid the consecutive use of **Alligare IMOX Herbicide** or other target site of action Group 2 herbicides that might have a similar target site of action, on the same weed species.
- ❑ Use tank mixtures or premixes with herbicides from different target site of action Groups as long as the involved products are all registered for the same use, have different sites of action and are both effective at the tank mix or prepack rate on the weed(s) of concern.
- ❑ Base herbicide use on a comprehensive Integrated Pest Management (IPM) program.
- ❑ Scout fields prior to application to identify the weed species present and their growth state to determine if the intended application will be effective.
- ❑ Scout fields after application to verify that the treatment was effective.
- ❑ Contact your local extension specialist, certified crop advisors and/or manufacturer for herbicide resistance management and/or integrated weed management recommendations for specific crops and resistant weed biotypes.

Report any incidence of non-performance of this product against a particular weed species to your Alligare, LLC retailer, representative or call 888-252-4427. If resistance is suspected, treat weed escapes with an herbicide having a different mechanism of action and/or use non-chemicals means to remove escapes, as practical, with the goal of preventing further seed production.

ADJUVANTS

For applications of **Alligare IMOX Herbicide** to emergent, floating or shoreline species, use of a spray adjuvant is required. The spray adjuvant used needs to be appropriate for aquatic sites.

Nonionic Surfactants: Use a nonionic surfactant at 0.25% volume/volume (v/v) or higher (see manufacturer's label) of the spray solution (0.25% v/v is equivalent to 1 quart in 100 gallons). For best results, select a nonionic surfactant with an HLB (hydrophilic to lipophilic balance) ratio between 12 and 17 with at least 70% surfactant in the formulated product (alcohols, fatty acids, oils, ethylene glycol or diethylene glycol should not be considered as surfactants to meet the above requirements).

Methylated Seed Oils or Vegetable Oil Concentrates: Methylated seed oil (MSO) or vegetable oil concentrate (VOC) may be used in replacement of a surfactant at 1.5 to 2 pints per acre. When using spray volumes greater than 30 gallons per acre, mix methylated seed oil or vegetable oil concentrates at 1% v/v of the total spray. The data indicates MSO aids in the deposition and imazamox uptake by plants under stress.

Silicone-Based Surfactants: Silicone-based surfactants allow greater

spreading of the spray droplet on the leaf surface, as compared to conventional nonionic surfactants. However, some silicone-based surfactants may dry too quickly and limit herbicide uptake or cause a target floating plant to sink quickly.

Refer to the surfactant manufacturer's label for specific rates.

Invert Emulsions: **Alligare IMOX Herbicide** may be applied as an invert emulsion spray. Prior to preparing an invert emulsion (water – oil) spray, conduct a jar test to check spray mixture compatibility. Invert emulsion sprays are designed to minimize spray drift and spray runoff, resulting in more herbicide on the target foliage. Use a single tank (batch mixing) or injected (in-line mixing) to prepare the invert emulsion spray. Refer to the emulsifier manufacturer's label for specific rates and proper mixing directions for aquatic sites.

Other: An antifoaming agent, spray pattern indicator, sinking or drift control agent may be applied at the product labeled rate if necessary or desired.

Tank Mixing: It is the pesticide user's responsibility to ensure that all products are registered for the intended use. Read and follow the applicable restrictions and limitations and directions for use on all product labels involved in tank mixing. Users must follow the most restrictive directions for use and precautionary statements of each product in the tank mixture.

SPRAY DRIFT MANAGEMENT

Aerial Applications

- ❑ Do not release spray at a height greater than 10 ft above the vegetative canopy, unless a greater application height is necessary for pilot safety.
- ❑ For applications prior to the emergence of target weeds, applicators are required to use a coarse or coarser droplet size (ASABE S572.1).
- ❑ For all applications, applicators are required to use a medium or coarser droplet size (ASABE S572.1).
- ❑ Applicators must use ½ swath displacement upwind at the downwind edge of the application site.
- ❑ Do not apply when wind speeds exceed 15 miles per hour at the application site. If the windspeed is greater than 10 mph, the boom length must be 65% or less of the wingspan for fixed wing aircraft and 75% or less of the rotor diameter for helicopters. Otherwise, the boom length must be 75% or less of the wingspan for fixed-wing aircraft and 90% or less of the rotor diameter for helicopters.
- ❑ Do not apply during temperature inversions.

Ground Boom Applications

- ❑ User must only apply with the release height recommended by the manufacturer, but no more than 3 feet above the ground or existing terrestrial or aquatic vegetation.
- ❑ For applications prior to the emergence of target weeds, applicators are required to use a coarse or coarser droplet size (ASABE S572.1).
- ❑ For all other applications, applicators are required to use a medium or coarser droplet size (ASABE S572.1).
- ❑ Do not apply when wind speeds exceed 15 miles per hour at the application site.
- ❑ Do not apply during temperature inversions.

Boomless Ground Applications

- ❑ Applicators are required to use a medium or coarser droplet size (ASABE S572.1) for all applications.
- ❑ Do not apply when wind speeds exceed 15 miles per hour at the application site.
- ❑ Do not apply during temperature inversions.

SPRAY DRIFT ADVISORIES

- ❑ THE APPLICATOR IS RESPONSIBLE FOR AVOIDING OFF-SITE SPRAY DRIFT.
- ❑ BE AWARE OF NEARBY NON-TARGET SITES AND ENVIRONMENTAL CONDITIONS.
- ❑ IMPORTANCE OF DROPLET SIZE

An effective way to reduce spray drift is to apply large droplets. Use the largest droplets that provide target pest control. While applying larger droplets will reduce spray drift, the potential for drift will be greater if applications are made improperly or under unfavorable environmental conditions.

Controlling Droplet Size - Ground Boom

- Volume - Increasing the spray volume so that larger droplets are produced will reduce spray drift. Use the highest practical spray volume for the application. If a greater spray volume is needed, consider using a nozzle with a higher flow rate.
- Pressure - Use the lowest spray pressure recommended for the nozzle to produce the target spray volume and droplet size.
- Spray Nozzle - Use a spray nozzle that is designed for the intended application. Consider using nozzles designed to reduce drift.

Controlling Droplet Size - Aircraft

- Adjust Nozzles - Follow nozzle manufacturers recommendations for setting up nozzles. Generally, to reduce fine droplets, nozzles should be oriented parallel with the airflow in flight.

- ❑ BOOM HEIGHT - Ground Boom
For ground equipment, the boom should remain level with the application site and have minimal bounce.
- ❑ RELEASE HEIGHT - Aircraft
Higher release heights increase the potential for spray drift.
- ❑ SHIELDED SPRAYERS
Shielding the boom or individual nozzles can reduce spray drift. Consider using shielded sprayers. Verify that the shields are not interfering with the uniform deposition of the spray on the target area.
- ❑ TEMPERATURE AND HUMIDITY
When making applications in hot and dry conditions, use larger droplets to reduce effects of evaporation.

- ❑ TEMPERATURE INVERSIONS
Drift potential is high during a temperature inversion. Temperature inversions are characterized by increasing temperature with altitude and are common on nights with limited cloud cover and light to no wind. The presence of an inversion can be indicated by ground fog or by the movement of smoke from a ground source or an aircraft smoke generator. Smoke that layers and moves laterally in a concentrated cloud (under low wind conditions) indicates an inversion, while smoke that moves upward and rapidly dissipates indicates good vertical air mixing. Avoid applications during temperature inversions.
- ❑ WIND
Drift potential generally increases with wind speed. AVOID APPLICATIONS DURING GUSTY WIND CONDITIONS.
 - Applicators need to be familiar with local wind patterns and terrain that could affect spray drift.
- ❑ Boom-less Ground Applications
 - Setting nozzles at the lowest effective height will help to reduce the potential for spray drift.
- ❑ Handheld Technology Applications
 - Take precautions to minimize spray drift.

TERRESTRIAL USE DIRECTIONS

Apply **Alligare IMOX Herbicide** with ground and aerial equipment including both fixed-wing aircraft and helicopter in sufficient water to obtain uniform distribution of spray to targeted foliage. Use foliar broadcast spray, foliar spot spray, injection (hack and squirt), frill and girdle, cut stump, or basal methods of applications.

Broadcast Spray Application

DO NOT apply more than 1 gallon of **Alligare IMOX Herbicide** per acre per year.

Foliar Spot Application

Apply as a solution containing up to 5% v/v **Alligare IMOX Herbicide** spray.

Injection (Hack and Squirt), Frill and Girdle, and Cut Stump Application

Treatments may be made using up to 100% v/v **Alligare IMOX Herbicide** solution.

Basal Application

Treatments can be made using up to 25% v/v **Alligare IMOX Herbicide** spray. Basal applications require the use of a good emulsion system to maintain **Alligare IMOX Herbicide** in a stable emulsion with a penetrating agent.

TERRESTRIAL RESTRICTIONS

DO NOT apply more than 1 gallon **Alligare IMOX Herbicide** (1 lb ae) per acre per year.

DO NOT apply more than 1 gallon **Alligare IMOX Herbicide** (1 lb ae) per acre per application.

DO NOT exceed 2 applications of **Alligare IMOX Herbicide** per year when using reduced application rates.

Minimum Retreatment Interval: 14 days

Vegetation Controlled

Alligare IMOX Herbicide may be used for the control of the following plant species. **Alligare IMOX Herbicide** may be effective for the control or suppression of additional plant species not listed below. The use of **Alligare IMOX Herbicide** for the control or suppression of undesirable plants not listed below may be done at the discretion of the user.

To the extent consistent with applicable law, the user assumes responsibility for any lack of control or suppression associated with application to weeds not listed on this label.

Foliar Application- Species Controlled

Common Name	Scientific Name	Rate Foliar (fl.oz./A)	Note(s)
Alligator weed	<i>Alternanthera philoxeroides</i>	64 - 128 (0.5 - 1 lb ae)	A.
Annual ryegrass	<i>Lolium multiflorum</i>	16 - 32 (0.125 - 0.25 lb ae)	
Artichoke, Jerusalem	<i>Helianthus tuberosus</i>	64 - 128 (0.5 - 1 lb ae)	
Bedstraw	<i>Galium aparine</i>	64 - 128 (0.5 - 1 lb ae)	
Beet, wild	<i>Beta procumbens</i>	64 - 128 (0.5 - 1 lb ae)	
Brazilian pepper* Christmasberry*	<i>Schinus terebinthifolius</i>	96 - 128 (0.75 - 1 lb ae)	B.

Common Name	Scientific Name	Rate Foliar (fl.oz./A)	Note(s)
Buckwheat, wild	<i>Polygonum convolvulus</i>	64 - 128 (0.5 – 1 lb ae)	
Buttercup	<i>Ranunculus</i> spp.	64 - 128 (0.5 – 1 lb ae)	
California bulrush*	<i>Schoenoplectus californicus</i>	64 - 128 (0.5 – 1 lb ae)	
Camphor tree*	<i>Cinnamomum camphora</i>	2% - 5% v/v	
Canola, volunteer (non-Clearfield®)	<i>Brassica campestris</i> <i>Brassica napus</i>	64 - 128 (0.5 – 1 lb ae)	
Cattail	<i>Typha</i> spp.	32 - 64 (0.25 – 0.5 lb ae)	
Chickweed, common	<i>Stellaria media</i>	64 - 128 (0.5 – 1 lb ae)	
Chinese tallowtree Popcorn tree	<i>Sapium sebiferum</i>	64 - 128 (0.5 – 1 lb ae)	C.
Cocklebur, common	<i>Xanthium strumarium</i>	64 - 128 (0.5 – 1 lb ae)	
Filaree, redstem Filaree, whitestem	<i>Erodium cicutarium</i> <i>Erodium moschatum</i>	64 - 128 (0.5 – 1 lb ae)	
Flixweed	<i>Descurainia sophia</i>	64 - 128 (0.5 – 1 lb ae)	
Giant ragweed**	<i>Ambrosia trifida</i>	32 - 64 (0.25 - 0.5 lb ae)	
Henbit	<i>Lamium amplexicaule</i>	64 - 128 (0.5 – 1 lb ae)	
Jamaican nightshade*	<i>Solanum jamaicense</i>	2% - 5% v/v	
Japanese stiltgrass	<i>Microstegium vimineum</i>	32 - 64 (0.25 – 0.5 lb ae)	D. & E.
Jimsonweed	<i>Datura stramonium</i>	64 - 128 (0.5 – 1 lb ae)	
Johnsongrass, rhizome Johnsongrass, seedling	<i>Sorghum halepense</i>	32 - 64 (0.25 – 0.5 lb ae) 16 - 32 (0.125 – 0.25 lb ae)	
Knotweed, prostrate	<i>Polygonum aviculare</i>	64 - 128 (0.5 – 1 lb ae)	
Kochia	<i>Kochia scoparia</i>	64 - 128 (0.5 – 1 lb ae)	
Lambsquarters, common	<i>Chenopodium album</i>	64 - 128 (0.5 – 1 lb ae)	
Lettuce, miner's	<i>Mantia perfoliata</i>	64 - 128 (0.5 – 1 lb ae)	
Mallow, common Mallow, Venice	<i>Malva neglecta</i> <i>Hibiscus trionum</i>	64 - 128 (0.5 – 1 lb ae)	
Mustard spp.	<i>Brassica</i> spp.	64 - 128 (0.5 – 1 lb ae)	
Nettle, burning	<i>Urtica urens</i>	64 - 128 (0.5 – 1 lb ae)	
Nettleleaf goosefoot	<i>Chenopodium murale</i>	64 - 128 (0.5 – 1 lb ae)	

Common Name	Scientific Name	Rate Foliar (fl.oz./A)	Note(s)
Nightshade, black Nightshade, Eastern black Nightshade, hairy	<i>Solanum nigrum</i> <i>Solanum ptycanthum</i> <i>Solanum sarrachoides</i>	64 - 128 (0.5 – 1 lb ae)	
Old World climbing fern*	<i>Lygodium microphyllum</i>	5% v/v	
Pennycress, field	<i>Thlaspi arvense</i>	64 - 128 (0.5 – 1 lb ae)	
Phragmites*	<i>Phragmites australis</i>	64 - 128 (0.5 – 1 lb ae)	F., G. & H.
Pigweed, prostrate Pigweed, redroot Pigweed, smooth Pigweed, spiny	<i>Amaranthus blitoides</i> <i>Amaranthus retroflexus</i> <i>Amaranthus hybridus</i> <i>Amaranthus spinosus</i>	64 - 128 (0.5 – 1 lb ae)	
Puncturevine	<i>Tribulus terrestris</i>	64 - 128 (0.5 – 1 lb ae)	
Purple loosestrife*	<i>Lythrum salicaria</i>	32 - 64 (0.25 – 0.5 lb ae)	
Purslane, common	<i>Portulaca oleracea</i>	64 - 128 (0.5 – 1 lb ae)	
Radish, wild	<i>Raphanus raphanistrum</i>	64 - 128 (0.5 – 1 lb ae)	
Ragweed, common Ragweed, giant	<i>Ambrosia artemisiifolia</i> <i>Ambrosia trifida</i>	64 - 128 (0.5 – 1 lb ae)	
Rocket, London Rocket, yellow	<i>Sisymbrium irio</i> <i>Barbarea vulgaris</i>	64 - 128 (0.5 – 1 lb ae)	
Saltcedar*	<i>Tamarix</i> spp.	64 - 128 (0.5 – 1 lb ae)	B. & D.
Sedge*, purple Sedge*, yellow	<i>Cyperus rotundus</i> <i>Cyperus esculentus</i>	32 - 64 (0.25 – 0.5 lb ae)	B.
Shepherd's-purse	<i>Capsella bursa-pastoris</i>	64 - 128 (0.5 – 1 lb ae)	
Smartweed, ladythumb Smartweed, Pennsylvania Smartweed, swamp	<i>Polygonum persicaria</i> , <i>Persicaria maculosa</i> <i>Polygonum pensylvanicum</i> , <i>Persicaria pensylvanica</i> <i>Polygonum coccineum</i> , <i>Persicaria amphibia</i>	64 - 128 (0.5 – 1 lb ae)	
Spike rush*	<i>Eleocharis</i> spp.	64 - 128 (0.5 – 1 lb ae)	
Spurge, prostrate	<i>Euphorbia maculata</i>	64 - 128 (0.5 – 1 lb ae)	
Sunflower, common	<i>Helianthus annuus</i>	64 - 128 (0.5 – 1 lb ae)	
Swinecress	<i>Coronopus didymus</i>	64 - 128 (0.5 – 1 lb ae)	
Tansymustard, green	<i>Descurainia pinnata</i>	64 - 128 (0.5 – 1 lb ae)	

Common Name	Scientific Name	Rate Foliar (fl.oz./A)	Note(s)
Taro	<i>Taro</i> spp.	64 - 128 (0.5 – 1 lb ae) 5% v/v	
Thistle, Russian	<i>Salsola iberica</i>	64 - 128 (0.5 – 1 lb ae)	
Tropical soda apple*	<i>Solanum viarum</i>	2% - 5% v/v	
Water primrose	<i>Ludwigia</i> spp.	32 - 64 (0.25 – 0.5 lb ae)	A.
Wetland nightshade*	<i>Solanum tampicense</i>	2% - 5% v/v	
Whitetop*	<i>Cardaria draba</i>	8 - 16 (0.063 – 0.125 lb ae)	
Hoary cress*			
Willowweed panicle	<i>Epilobium brachycarpum</i>	64 - 128 (0.5 – 1 lb ae)	
Velvetleaf	<i>Abutilon theophrasti</i>	64 - 128 (0.5 – 1 lb ae)	

* Not approved for this use in California.
** Suppression of larger, well-established plants

- Use with an appropriate labeled glyphosate product will improve efficacy.
- Also use a 2% - 5% v/v **Alligare IMOX Herbicide** spray
- See Special Weed Control section.
- Use MSO at 1% v/v by spray.
- Alligare IMOX Herbicide** will provide some residual control of subsequent seedling emergence.
- Use 1 quart per acre of methylated seed oil (MSO); apply in late vegetative stage up to killing frost.
- Also use a spot treatment with 1% - 2% v/v **Alligare Imazamox Herbicide** spray.
- Older stands of phragmites and stands growing in water may require follow-up applications to control.

For optimum control with foliar applications, use methylated seed oil (MSO) at 1% v/v spray.

Specific Weed Control - Chinese Tallowtree

Apply **Alligare IMOX Herbicide** at 64 - 128 fluid ounces (0.5 – 1 lb ae) per acre or 0.5 - 2.0% v/v spray as a foliar application for selective control of Chinese tallowtree in and around tolerant tree species. Control Chinese tallowtree with foliar applications using aerial, handgun, or backpack application methods. Use an application method and spray volume that provides adequate coverage of targeted Chinese tallowtree plants. Add methylated seed oil at 1 quart per acre for broadcast applications, or at 1% v/v for spot backpack and handgun applications. Tolerant hardwood species may exhibit varying degrees of leaf discoloration and temporary injury.

Areas that may be Grazed or Cut for Hay

Alligare IMOX Herbicide applied to listed aquatic and terrestrial non-crop sites may be grazed or cut for hay at a maximum use rate of 1 gallon per acre of **Alligare IMOX Herbicide** (1 lb ae) or 5% v/v spray for spot treatments. There are no grazing or haying restrictions.

AQUATIC USE DIRECTIONS

Apply **Alligare IMOX Herbicide** beneath the water surface or broadcast directly to the water surface for the control of target submersed aquatic plant species and for some emergent and floating species, or as a foliar broadcast application for emergent and floating species.

Apply **Alligare IMOX Herbicide** with ground and aerial equipment including both fixed-wing aircraft and helicopter in sufficient water to obtain uniform distribution of spray to water surface and/or targeted foliar applications.

Water Application to Submersed, Emergent and Floating Vegetation
Inject below the water surface or broadcast apply to the water surface with **Alligare IMOX Herbicide** to control submersed aquatic plant species and some emergent and floating species. Apply **Alligare IMOX Herbicide** as an undiluted product or diluted with water prior to application. When surface-matted conditions exist, inject **Alligare IMOX Herbicide** below the water surface to improve product distribution and efficacy.

Apply **Alligare IMOX Herbicide** to water to achieve a final concentration of the active ingredient of no more than 500 ppb (173 fl ozs; 1.35 lbs ae). To maintain the desired vegetation response, multiple applications of **Alligare IMOX Herbicide** may be made during the annual growth cycle.

Alligare IMOX Herbicide Rates Per Treated Surface Acre

Average Water Depth of Treatment Site (feet)	Desired Active Ingredient Concentration (ppb) (ppb)*			
	50	100	200	500
	Alligare IMOX Herbicide Rate per Treated Surface Acre (fl. oz. ...)			
1	17 (0.13 lb ae)	35 (0.27 lb ae)	69 (0.54 lb ae)	173 (1.35 lbs ae)
2	35 (0.27 lb ae)	69 (0.54 lb ae)	138 (1.08 lbs ae)	346 (2.70 lbs ae)
3	52 (0.41 lb ae)	104 (0.81 lb ae)	207 (1.62 lbs ae)	518 (4.05 lbs ae)
4	70 (0.55 lb ae)	138 (1.08 lbs ae)	277 (2.16 lbs ae)	691 (5.40 lbs ae)
5	87 (0.68 lb ae)	173 (1.35 lbs ae)	346 (2.70 lbs ae)	864 (6.75 lbs ae)
6	104 (0.81 lb ae)	207 (1.62 lbs ae)	415 (3.24 lbs ae)	1037 (8.10 lbs ae)
7	122 (0.95 lb ae)	242 (1.89 lbs ae)	484 (3.78 lbs ae)	1210 (9.45 lbs ae)
8	139 (1.09 lbs ae)	277 (2.16 lbs ae)	553 (4.32 lbs ae)	1382 (10.80 lbs ae)
9	157 (1.23 lbs ae)	311 (2.43 lbs ae)	622 (4.86 lbs ae)	1555 (12.15 lbs ae)
10	174 (1.36 lbs ae)	346 (2.70 lbs ae)	691 (5.40 lbs ae)	1728 (13.5 lbs ae)

***Alligare IMOX Herbicide** contains 1.0 pound of imazamox acid equivalent (ae) per gallon.
1 gallon = 128 fl. oz.

Foliar Application to Listed Emergent and/or Floating Vegetation

Broadcast apply or spot treat the water surface with **Alligare IMOX Herbicide** to control emergent and floating species. For broadcast applications, use a minimum of 10 gallons of water per surface acre in properly calibrated equipment for uniform coverage. Use higher spray volumes to ensure uniform spray coverage, when treating areas with large and/or dense vegetation. To minimize the drift potential, use an appropriate spray pressure depending upon spray equipment, conditions and application objectives. (See Spray Drift Ground Boom Application Requirements section.) As a spot treatment, use from 0.25 - 5% v/v **Alligare IMOX Herbicide** spray.

To enhance foliar applications on emergent and floating weeds, always use an adjuvant.

If spray is washed off by wave action, control will be reduced.

In aquatic sites, application techniques described in the **Terrestrial Use**

Directions section may be used to treat target emergent vegetation.

Aerial Application

Both fixed-wing aircraft and helicopter may be used to apply **Alligare IMOX Herbicide** by air. For direct applications to the water, there is no minimum spray volume. For broadcast applications targeting emergent and/or floating vegetation, use a minimum of 5 gallons of water per surface acre in properly calibrated equipment for uniform coverage. For aerial applications, best results are obtained by using a minimum of 20 gallons per acre. (See Spray Drift Aerial Application Requirements section.)

Drawdown Application

Alligare IMOX Herbicide may be used for preemergence and/or postemergence control/suppression of aquatic vegetation in drawdown situations. As a broadcast spray, apply **Alligare IMOX Herbicide** at rates up to 1 gallon per acre (1 lb ae) or as a spot treatment with up to 5% v/v **Alligare IMOX Herbicide** spray. After water has receded and exposed soil is moist to dry, make application. After foliar postemergence applications, delay at least two weeks before reintroducing water.

AQUATIC RESTRICTIONS

DO NOT exceed maximum use rate per application:

Water treatment - 500 parts per billion (ppb) (173 fluid ounces of **Alligare IMOX Herbicide** (1.35lbs ae) per acre foot)

Foliar broadcast application - 1 gallon **Alligare IMOX Herbicide** (1 lb ae) per acre

Foliar spot application - up to 5% v/v **Alligare IMOX Herbicide**

Minimum Retreatment Intervals:

Water treatment - 14 days; unless the retreatment is following an initial water column application that has failed to maintain the original targeted ppb concentration.

Foliar broadcast applications – 14 days

Foliar spot applications – Retreat as needed

Irrigation Restrictions

- ❑ **DO NOT** use treated water to irrigate greenhouses, nurseries, or hydroponics until the imazamox concentration has been determined by an acceptable method to be less than or equal to 1.0 ppb.
- ❑ **DO NOT** plant sugar beets, onions, potatoes or non-Clearfield® canola in soils that have been previously irrigated with **Alligare IMOX Herbicide** treated water until a soil bioassay successfully demonstrates acceptable levels of crop tolerance. The only exception to this restriction is if the water is from foliar applications to emergent and/or floating vegetation in flowing water sites where it has been applied at less than or equal to 1.5 quarts (0.375 lb ae) per acre to waters with an average depth of greater than or equal to 4 feet.
- ❑ **DO NOT** use **Alligare IMOX Herbicide** treated waters resulting in a concentration greater than 50 ppb for irrigation of established (emerged) plants until residue levels have been shown to be less than or equal to 50 ppb by an acceptable method.
- ❑ **DO NOT** make **Alligare IMOX Herbicide** applications in and around golf course irrigation, sod farm irrigation, and vineyard irrigation waterbodies without testing potential irrigation water prior to irrigation and confirming the imazamox concentration to be less than or equal to 1.0 ppb.
- ❑ In still or quiescent waters, **DO NOT** use **Alligare IMOX Herbicide** treated water resulting in a concentration greater than 10 ppb for irrigation of newly seeded or newly established plants until imazamox residue levels have been shown to be less than or equal to 10 ppb by an acceptable method.
- ❑ Wait 24 hours before irrigating from still or quiescent waters after making an **Alligare IMOX Herbicide** application for submerged vegetation less than 100 feet from an irrigation intake.
- ❑ Wait 24 hours before irrigating from still and quiescent waters after making an **Alligare IMOX Herbicide** application to emergent and/or floating vegetation if greater than 25% of the surface area of the water body has been treated or application was made less than

100 feet from an irrigation intake.

- ❑ Flowing waters may be used to irrigate allowable sites with no restrictions when **Alligare IMOX Herbicide** is applied at less than or equal to 2 quarts (0.5 lb ae) per acre to waters with an average depth of greater than or equal to 4 feet.
- ❑ After application of **Alligare IMOX Herbicide** to dry irrigation canals/ditches below the high-water mark, the initial flush of water during recharge must not be used for irrigation purposes unless the imazamox concentration has been determined by an acceptable method to be less than 25 ppb.

Alligare IMOX Herbicide applied at less than or equal to 2 quarts (0.5 lb ae) per acre in or on waters with a minimum average depth greater than or equal to 4 feet, will result in imazamox concentrations less than 25 ppb.

Other Water Use Restrictions

There are no restrictions on livestock watering, swimming, fishing, domestic use, or use of treated water for agricultural sprays. No recharge flush or water use restrictions are required for applications to dry areas above the high-water line of irrigation canals or channels.

Potable Water

Alligare IMOX Herbicide may be applied to potable water sources at concentrations up to 500 ppb (173 fl oz; 1.35 lbs ae) to within a distance of 1/4 mile from an active potable water intake. Within 1/4 mile of an active potable water intake, **Alligare IMOX Herbicide** may be applied, but water concentrations resulting from injection and/or foliar applications may not exceed 50 ppb. If water concentrations greater than 50 ppb are required, the potable water intake must be shut and, if necessary, an alternate water supply be made available until the water concentration can be shown to be less than 50 ppb by an acceptable method.

Vegetation Controlled or Suppressed

The performance of **Alligare IMOX Herbicide** is dependent upon many factors including: dose, time of year, stage of plant growth, plant susceptibility, environmental conditions, method of application, and water movement. The rate selection is partially dependent on characteristics of the treatment area and whether growth regulation or control is desired. A repeat application to control or suppress regrowth may be required depending on environmental and growing conditions. To determine best management practices to control individual species and to meet specific aquatic plant management objectives consult with the local extension service.

Emergent, Floating, and Shoreline Species

Common Name	Scientific Name	Rate (fl. oz. /A)	Note(s)
Alligatorweed	<i>Alternanthera philoxeroides</i>	64 - 128 (0.5 - 1 lb ae)	A. & B.
American lotus	<i>Nelumbo lutea</i>	64 - 128 (0.5 - 1 lb ae)	
Arrowhead	<i>Sagittaria</i> spp.	32 - 64 (0.25 - 0.5 lb ae)	
Cattail	<i>Typha</i> spp.	32 - 64 (0.25 - 0.5 lb ae)	C.
Chinese tallowtree	<i>Sapium sebiferum</i>	64 - 128 (0.5 - 1 lb ae)	
Common reed	<i>Phragmites</i> spp.	96 - 128 (0.75 - 1 lb ae)	D. & E.
Common salvinia	<i>Salvinia minima</i>	32 - 64 (0.25 - 0.5 lb ae)	F.
Floating heart	<i>Nymphoides</i> spp.	64 - 128 (0.5 - 1 lb ae)	G.
Floating pennywort	<i>Hydrocotyle ranunculoides</i>	32 - 64 (0.25 - 0.5 lb ae)	A.
Flowering rush	<i>Butomus umbellatus</i>	64 - 128 (0.5 - 1 lb ae)	

Common Name	Scientific Name	Rate (fl. oz. /A)	Note(s)
Four-leaf clover	<i>Marsilea</i> spp.	32 - 64 (0.25 - 0.5 lb ae)	
Frog's bit, Sponge plant	<i>Lymnobia</i> spp.	16 - 32 (0.125 - 0.25 lb ae)	
Giant cane	<i>Arundo donax</i>	64 - 128 (0.5 - 1 lb ae)	
Japanese knotweed	<i>Polygonum cuspidatum</i>	64 - 128 (0.5 - 1 lb ae)	
Mexican lily	<i>Nymphaea mexicana</i>	32 - 64 (0.25 - 0.5 lb ae)	
Mosquito fern	<i>Azolla</i> spp.	-	G.
Parrotfeather	<i>Myriophyllum aquaticum</i>	64 - 128 (0.5 - 1 lb ae)	H.
Pickrelweed	<i>Pontederia cordata</i>	32 - 64 (0.25 - 0.5 lb ae)	
Saltcedar	<i>Tamarix</i> spp.	64 - 128 (0.5 - 1 lb ae)	G.
Smartweed, ladysthumb	<i>Polygonum persicaria</i> , <i>Persicaria maculosa</i>	64 - 128 (0.5 - 1 lb ae)	
Smartweed, Pennsylvania	<i>Polygonum pennsylvanicum</i> , <i>Persicaria pennsylvanica</i>		
Smartweed, swamp	<i>Polygonum coccineum</i> , <i>Persicaria amphibia</i>		
Spatterdock	<i>Nuphar lutea</i>	64 - 128 (0.5 - 1 lb ae)	
Variable-leaf milfoil	<i>Myriophyllum heterophyllum</i>	64 - 128 (0.5 - 1 lb ae)	K. & L.
Water chestnut	<i>Trapa natans</i>	64 - 128 (0.5 - 1 lb ae)	M. & G.
Water hyacinth	<i>Eichhornia crassipes</i>	16 - 32 (0.125 - 0.25 lb ae)	
Water lettuce	<i>Pistia stratiotes</i>	48 - 96 (0.375 - 0.75 lb ae)	
Water lily	<i>Nymphaea</i> spp.	32 - 64 (0.25 - 0.5 lb ae)	
Water primrose	<i>Ludwigia</i> spp.	32 - 64 (0.25 - 0.5 lb ae)	B.
Watershield	<i>Brasenia schreberi</i>	48 - 64 (0.375 - 0.5 lb ae)	
Wild taro	<i>Colocasia esculenta</i>	96 - 128 (0.75 - 1 lb ae)	

- A.** Repeat applications may be necessary.
B. Use with an appropriate labeled glyphosate product for faster brownout.
C. Apply after full greenup through killing frost.
D. Apply with MSO; apply in late vegetative stage up to killing frost.
E. Also apply as a spot treatment using 1% to 2% v/v **Alligare IMOX Herbicide** spray. Older stands of phragmites and stands growing in water may be more difficult to control and will require follow-up applications.

- F.** Apply with MSO or MSO plus silicone-based surfactant; retreatment will be necessary.
G. Also apply as a spot treatment using 2% to 5% v/v **Alligare IMOX Herbicide** plus 1% v/v MSO spray.
H. Apply only to emergent vegetation.
K. Apply with MSO (1% v/v) as an emergent foliar treatment when plants have emerged on the surface.
L. Also apply as a spot treatment using 1% to 3% v/v **Alligare Imazamox Herbicide** spray.
M. Apply with MSO to emergent part of plant.

Vascular Aquatic Plant Control Using Surface or Injected Herbicide Applications (50-500 ppb)

There are three herbicide susceptibility levels of control for vascular aquatic plants: susceptible (50-200 ppb), intermediately susceptible (100-300 ppb) and partially susceptible (200-500 ppb).

Some vascular aquatic plants that are easy to control from foliar applications of **Alligare IMOX Herbicide** may be hard to control from in-water applications. Higher use rates may be required to achieve desired control/suppression in sites with high water exchange rates or when treating more mature or less susceptible plants or when targeting more difficult-to-control aquatic species or when treating small areas in larger bodies of water (partial or spot treatments). Lower concentrations are normally used when conducting early season large-scale treatments; when greater selectivity is desired; and treating larger areas, more immature or susceptible plants, and areas with less potential for rapid water exchange.

Use of lower rates may increase selectivity on some species within the same category. Effects on susceptible plants can range from control to growth regulation depending on treatment site characteristics, exposure time, and application rate. Susceptible plant species may exhibit herbicide stress or reduced growth during active treatment phases. Whole lake applications with lower rates may provide plant growth regulation or greater selectivity while higher rates will normally provide broader activity.

Vascular Aquatic Plant Susceptibility Chart

Common Name	Scientific Name	Rate (ppb)
American pondweed	<i>Potamogeton nodosus</i>	100 - 300
Bladderwort	<i>Utricularia</i> spp.	100 - 300
Bulrush	<i>Schoenoplectus californicus</i>	200 - 500
Cattail	<i>Typha</i> spp.	200 - 500
Coontail	<i>Ceratophyllum demersum</i>	200 - 500
Curlyleaf pondweed	<i>Potamogeton crispus</i>	50 - 200
Eelgrass, Japanese	<i>Zostera japonica</i>	200 - 500
Egeria	<i>Egeria densa</i>	200 - 500
Eurasian watermilfoil	<i>Myriophyllum spicatum</i>	50 - 200
Flowering rush	<i>Butomus umbellatus</i>	200 - 500
Frog's bit	<i>Lymnobia spongia</i>	100 - 300
Hydrilla	<i>Hydrilla verticillata</i>	50- 200
Illinois pondweed	<i>Potamogeton illinoensis</i>	100 - 300
Pickrelweed	<i>Pontederia cordata</i>	100 - 300
Salvinia	<i>Salvinia</i> spp.	100 - 300
Sago pondweed	<i>Stuckenia pectinata</i>	50 - 200
Southern naiad	<i>Najas guadalupensis</i>	200 - 500
Spatterdock	<i>Nuphar lutea</i>	200 - 500
Spikerush	<i>Eleocharis baldwinii</i>	100 - 300
Variable-leaf milfoil	<i>Myriophyllum heterophyllum</i>	100 - 300

Common Name	Scientific Name	Rate (ppb)
Water hyacinth	<i>Eichhornia crassipes</i>	50 – 200
Water lily	<i>Nymphaea odorata</i>	200 – 500
Watershield	<i>Brasenia schreberi</i>	200 – 500
Water stargrass	<i>Heteranthera dubia</i>	50 – 200
Wigeon grass	<i>Ruppia maritima</i>	100 – 300

Specific Weed Control Directions

For Eurasian Watermilfoil. Use **Alligare IMOX Herbicide** at 100 - 200 ppb range early in the growing season to actively growing plants. Repeat applications may be required on mature Eurasian watermilfoil where the vegetation has topped out.

For Hydrilla. Use **Alligare IMOX Herbicide** at 150 - 200 ppb range early in the growing season to actively growing plants. Repeat applications may be required if the application is made prior to topped-out hydrilla. To suppress and growth-regulate hydrilla for up to 10 - 12 weeks, use a single application of 50 to 75 ppb. To extend the period of growth suppression when normal hydrilla growth resume, apply a second application of 50 to 75 ppb.

For Japanese Eelgrass. Since Japanese eelgrass is found in tidal and intertidal areas and is a submersed aquatic plant, apply **Alligare IMOX Herbicide** either directly in the water or directly to the plant (e.g. at low tide).

- **Low-tide application** - When the Japanese eelgrass is exposed at low tide, apply **Alligare IMOX Herbicide** uniformly with properly calibrated broadcast or spot treatment equipment in 10 or more gallons of water per acre.
 - o Use of an appropriate spray adjuvant approved for aquatic is optional.
 - o For spot treatments apply up to 5% v/v **Alligare IMOX Herbicide** spray. When treating areas with large and/or dense vegetation, higher spray volumes may be required. Depending upon spray equipment, conditions, and application objectives, adjust spray pressure to minimize drift potential.
 - o For broadcast application, apply 4 - 32 fluid ounces (0.031 – 0.25 lb ae) per acre of **Alligare IMOX Herbicide**. Use the lower rate for management of seedlings.
- **In-water application** – If Japanese eelgrass is submersed, apply **Alligare IMOX Herbicide** as broadcast spray to the water surface or injected below the water surface. **Alligare IMOX Herbicide** may be applied as undiluted product or diluted with water before application. Under surface-matted conditions, inject **Alligare IMOX Herbicide** below the water surface to improve product distribution. Apply **Alligare IMOX Herbicide** to water to achieve a final concentration of the active ingredient of no more than 500 ppb. Multiple applications of **Alligare IMOX Herbicide** may be made during the annual growth cycle to maintain the desired vegetation response.

For Sago Pondweed. In dry ditches (drainage and irrigation), sago pondweed may be controlled or growth-suppressed with soil-applied **Alligare IMOX Herbicide** at 64 - 128 fluid ounces (0.5 lb – 1 lb ae) per acre. In irrigation canals, apply **Alligare IMOX Herbicide** after drawdown and prior to water recharge.

STORAGE AND DISPOSAL

Do not contaminate water, food, or feed by storage and disposal.

PESTICIDE STORAGE: Store in original container only. Avoid freezing. Store above 32°F. If frozen, poor weed control may result. In case of leak or spill, use absorbent materials to contain liquids and dispose as waste.

PESTICIDE DISPOSAL: Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility.

CONTAINER HANDLING: Non-refillable container. Do not reuse or refill this container. Offer for recycling if available or puncture and dispose of in a sanitary landfill, or by incineration, or if allowed by state and local authorities, by burning. If burned, stay out of smoke. Triple rinse or pressure rinse container (or equivalent) promptly after emptying. **Triple rinse** as follows: Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container 1/4 full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. **Pressure rinse** as follows: Empty the remaining contents into application equipment or a mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank or collect rinsate for later use or disposal. Insert pressure rinsing nozzle in the side of the container, and rinse at about 40 psi for at least 30 seconds. Drain for 10 seconds after the flow begins to drip.

CONDITION OF SALE AND LIMITATION OF WARRANTY AND LIABILITY

To the extent consistent with applicable law, upon purchase or use of this product, purchaser and user agree to the following terms:

Warranty: Alligare, LLC (the Company) warrants that this product conforms to the chemical description on the label in all material respects and is reasonably fit for the purpose referred to in the directions for use, subject to the exceptions noted below, which are beyond the Company's control. To the extent consistent with applicable law, the Company makes no other representation or warranty, express or implied, concerning the product, including no implied warranty of merchantability or fitness for a particular purpose. To the extent consistent with applicable law, no such warranty shall be implied by law, and no agent or representative is authorized to make any such warranty on the Company's behalf.

Terms of Sale: The Company's directions for use of this product must be followed carefully. It is impossible to eliminate all risks inherently associated with use of this product. Crop injury, ineffectiveness or other unintended consequences may result because of such factors as weather conditions, presence of other materials, and the manner of use or application (including failure to adhere to label directions), all of which are beyond the Company's control. To the extent consistent with applicable law, all such risks are assumed by the user.

Limitation of Liability: To the extent consistent with applicable law, the exclusive remedy against the Company for any cause of action relating to the handling or use of this product is a claim for damages, and in no event shall damages or any other recovery of any kind exceed the price of the product which caused the alleged loss, damage, injury or other claim. To the extent consistent with applicable law, under no circumstances shall the Company be liable for any special, indirect, incidental or consequential damages of any kind, including loss of profits or income. Some states do not allow the exclusion or limitation of incidental or consequential damages. The Company and the seller offer this product, and the purchaser and user accept this product, subject to the foregoing warranty, terms of sale and limitation of liability, which may be varied or modified only by an agreement in writing signed on behalf of the Company by an authorized representative.

IMOX™ is a trademark of Alligare, LLC

EPA 2000918





IMOX™

HERBICIDE

A herbicide for the selective management of undesirable vegetation in and around aquatic sites and terrestrial non-crop areas, industrial sites and rights-of-ways. The herbicide may be used on listed sites that are cut for hay or grazed.

ACTIVE INGREDIENT:

Ammonium salt of imazamox* 12.1%

OTHER INGREDIENTS: 87.9%

TOTAL: 100.0%

*Equivalent to 11.4% imazamox acid

Contains 1 pound of imazamox acid equivalent (ae) per gallon.

EPA Reg. No. 81927-66

EPA Est. No. 37429-GA-001^{BT}
81927-AL-001TM

Letter(s) in lot number correspond(s)
to superscript in EPA Est. No.

KEEP OUT OF REACH OF CHILDREN

CAUTION/PRECAUCION

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand the label, find someone to explain it to you in detail.)

FIRST AID

If on skin or clothing: Take off contaminated clothing. Rinse skin immediately with plenty of water for 15 to 20 minutes. Call a poison control center or doctor for treatment advice.

If in eyes: Hold eyes open and rinse slowly and gently with water for 15 to 20 minutes. Remove contact lenses, if present, after the first 5 minutes; then continue rinsing eyes. Call a poison control center or doctor for treatment advice.

If inhaled: Move person to fresh air. If person is not breathing, call 911 or an ambulance; then give artificial respiration, preferably mouth to mouth if possible. Call a poison control center or doctor for further treatment advice.

HOT LINE NUMBER

Have the product container or label with you when calling a poison control center or doctor or going for treatment. You may also contact 1-800-424-9300 for emergency medical treatment information.

Manufactured for:

Alligare, LLC
1565 5th Avenue
Opelika, AL 36801

PRECAUTIONARY STATEMENTS**HAZARDS TO HUMANS AND DOMESTIC ANIMALS****CAUTION**

Harmful if absorbed through skin or inhaled. Causes moderate eye irritation. Avoid breathing spray mist. Avoid contact with skin, eyes or clothing.

STORAGE AND DISPOSAL

Do not contaminate water, food, or feed by storage and disposal.

PESTICIDE STORAGE: Store in original container only. Avoid freezing. Store above 32°F. If frozen, poor weed control may result. In case of leak or spill, use absorbent materials to contain liquids and dispose as waste.

PESTICIDE DISPOSAL: Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility.

CONTAINER HANDLING: Non-refillable container. Do not reuse or refill this container. Offer for recycling if available or puncture and dispose of in a sanitary landfill, or by incineration, or if allowed by state and local authorities, by burning. If burned, stay out of smoke.

Triple rinse or pressure rinse container (or equivalent) promptly after emptying. **Triple rinse** as follows: Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container 1/4 full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. **Pressure rinse** as follows: Empty the remaining contents into application equipment or a mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank or collect rinsate for later use or disposal. Insert pressure rinsing nozzle in the side of the container, and rinse at about 40 psi for at least 30 seconds. Drain for 10 seconds after the flow begins to drip.

See label booklet for additional Precautionary Statements and Directions for Use.

Net Contents: 2.5 Gallons (9.46 liters)

EPA 20200918



GROUP 4 HERBICIDE

TRICLOPYR 3

Herbicide for Control of Woody Plants, Aquatic Plants and Annual and Perennial Broadleaf Weeds in Forests; Industrial Non-crop areas including industrial manufacturing and storage sites; Rights-of-way such as electrical power lines, communication lines, pipelines, roadsides, and railroads; Fence rows; Non-irrigation ditch banks; Non-crop areas around farm buildings; on Christmas tree plantations; Chemical mowing*; on Wetland sites in production forests and industrial non-crop areas; in Aquatic sites such as ponds, lakes, reservoirs, non-irrigation canals, and ditches which have little or no continuous outflow.

*Not approved for this use in California.

ACTIVE INGREDIENT:

Triclopyr: 3,5,6-trichloro-2-pyridinyloxyacetic acid, triethylamine salt* 44.4%

OTHER INGREDIENTS: 55.6%

TOTAL: 100.0%

*Contains 3 pounds of Triclopyr acid equivalent per gallon (31.8%)

EPA Reg. No. 81927-13

EPA Est. No. 42750-MO-001^{ALB}

81927-AL-001^{PM}; 75640-COL-001^{PC}

7401-TX-001^{TX}; 51896-MS-19^{NT}

Letter(s) in lot number correspond(s) to superscript in EPA Est. No.

KEEP OUT OF REACH OF CHILDREN

DANGER / PELIGRO

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand the label, find someone to explain it to you in detail).

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS AND DOMESTIC ANIMALS
DANGER

Corrosive. Causes irreversible eye damage. Harmful if absorbed through skin or swallowed. Do not get in eyes, on skin, or on clothing. Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco, or using the toilet. Remove and wash contaminated clothing before reuse.

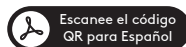
Manufactured for:
Alligare, LLC
1565 5th Avenue
Opelika, AL 36801

Net Contents: 2.5 Gallons (9.46 liters)

FIRST AID	
If in eyes	• Hold eye open and rinse slowly and gently with water for 15-20 minutes. • Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. • Call a poison control center or doctor for treatment advice.
If on skin or clothing	• Take off contaminated clothing. • Rinse skin immediately with plenty of water for 15-20 minutes. • Call a poison control center or doctor for treatment advice.
If swallowed	• Call a poison control center or doctor immediately for treatment advice. • Have person sip a glass of water if able to swallow. • Do not induce vomiting unless told to do so by a poison control center or doctor. • Do not give anything by mouth to an unconscious person.
HOT LINE NUMBER	
Have the product container or label with you when calling a poison control center or doctor, or going for treatment. You may also contact 1-800-424-9300 for emergency medical treatment information.	
NOTE TO APPLICATOR: Allergic skin reaction is not expected from exposure to spray solutions of Alligare Triclopyr 3 herbicide when used as directed.	
NOTE TO PHYSICIAN: Probable mucosal damage may contraindicate the use of gastric lavage.	

See label booklet for additional Precautionary Statements and Directions for Use.

EPA 20210806



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PERSONAL PROTECTIVE EQUIPMENT (PPE)

Applicators and other handlers who handle this pesticide must wear:

- Long-sleeved shirt and long pants
- Shoes plus socks
- Protective eyewear
- Waterproof gloves

Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. Do not reuse them. Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables are given, use detergent and hot water. Keep and wash PPE separately from other laundry.

When handlers use closed systems, enclosed cabs, or aircraft in a manner that meets the requirements listed in the Worker Protection Standard (WPS) for agricultural pesticides [40 CFR 170.240(d)(4-6)], the handler PPE requirements may be reduced or modified as specified in the WPS.

USER SAFETY RECOMMENDATIONS

Users should:

- Remove clothing/PPE immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
- Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

ENVIRONMENTAL HAZARDS

For terrestrial uses, do not apply directly to water, to areas where surface water is present, or to intertidal areas below the mean high water mark. Do not contaminate water when cleaning equipment or disposing of equipment washwaters.

For aquatic uses, under certain conditions, treatment of aquatic weeds can result in oxygen depletion or loss due to decomposition of dead plants, which may contribute to fish suffocation. This loss can cause fish suffocation. Therefore, to minimize this hazard, do not treat more than one-third to one-half of the water area in a single operation and wait at least 10 to 14 days between treatments. Begin treatment along the shore and proceed outwards in bands to allow fish to move into untreated areas. Consult with the State agency for fish and game before applying to public water to determine if a permit is needed.

This chemical has properties and characteristics associated with chemicals detected in groundwater. The use of this chemical in areas where soils are permeable, particularly where the water table is shallow, may result in groundwater contamination.

PHYSICAL OR CHEMICAL HAZARDS

Combustible. Do not use or store the product near heat or open flame.

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your State or Tribe, consult the agency responsible for pesticide regulation.

AGRICULTURAL USE REQUIREMENTS

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR Part 170. This Standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE) and restricted-entry interval (REI). The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

Do not enter or allow worker entry into treated areas during the restricted entry interval (REI) of 48 hours.

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water, is:

- Coveralls
- Waterproof gloves
- Shoes plus socks
- Protective eyewear

NON-AGRICULTURAL USE REQUIREMENTS

The requirements in this box apply to uses of this product that are NOT within the scope of the Worker Protection Standard for agricultural pesticides (40 CFR Part 170). The WPS applies when this product is used to produce agricultural plants on farms, forest, nurseries, or greenhouses. For applications to non-cropland areas, do not enter or allow others to enter the treated area until sprays have dried.

PRODUCT INFORMATION

Alligare Triclopyr 3 is used to control unwanted woody plants, aquatic plants, and annual and perennial broadleaf weeds:

- in Forests
- in Industrial Non-crop areas including industrial manufacturing and storage sites
- in Rights-of-way such as electrical power lines, communication lines, pipelines, roadsides, and railroads
- in Fence rows
- in Non-irrigation ditch banks
- around Farm buildings
- on Christmas tree plantations
- for Chemical mowing (Not approved for this use in California)
- on Wetland sites in production forests and industrial non-crop areas
- in Aquatic sites such as ponds, lakes, reservoirs, non-irrigation canals, and ditches which have little or no continuous outflow

Alligare Triclopyr 3 use on these sites may include application to grazed areas as well as for the establishment and maintenance of wildlife openings.

USE PRECAUTIONS

- Obtain required permits: Consult with appropriate state or local water authorities before applying this product to public waters. State or local public agencies may require permits.
- It is permissible to treat non-irrigation ditch banks, seasonally dry wetlands (such as flood plains, deltas, marshes, swamps, or bogs) and transitional areas between upland and lowland sites.
- When making application to banks or shorelines of moving water sites, minimize overspray to open water.

USE RESTRICTIONS

- Do not apply this product through any type of irrigation system.
- Do not apply to ditches or canals used to transport irrigation water. It is permissible to treat non-irrigation ditch banks.
- Do not apply where runoff or irrigation water may flow onto agricultural land as injury to crops may result.
- Do not apply directly to un-impounded rivers or streams.
- Do not apply to salt water bays or estuaries.
- Do not apply using a mistblower.
- Do not make direct applications or allow spray mists to drift onto cotton; grapes; soybeans; tobacco; vegetable crops; flowers; ornamental shrubs or trees; or other desirable broadleaf plants.
- For rights-of-ways, fence rows, or any area where grazing and haying is allowed, do not apply more than 2 lb a.e. of triclopyr (2/3 gallon of Alligare Triclopyr 3) per acre per year.
- For forestry uses, do not apply more than 6 lb a.e. of triclopyr (2 gallons of Alligare Triclopyr 3) per acre per year.
- For all terrestrial uses other than forestry sites, and grazing/haying areas, a maximum of 9 lb a.e. of triclopyr (3 gallons of Alligare Triclopyr 3) per acre per year may be applied.
- All livestock, except lactating dairy animals, can graze at any time.
- Lactating dairy animals cannot graze forage until the next growing season after application.
- Do not harvest hay for 14 days after application.
- Grazed areas of non-cropland and forestry sites may be spot treated if they comprise no more than 10% of the total grazable area.
- Withdraw livestock from grazing treated grass or consumption of treated hay at least 3 days before slaughter.
- **Arizona:** Alligare Triclopyr 3 has not been approved for use on plants grown for commercial production, specifically forests grown for commercial timber production, or on designated grazing areas.

APPLICATION DIRECTIONS

RATES

This table assists in determining proper volumes of Alligare Triclopyr 3 in the spray tank to avoid exceeding the maximum use rates using varying spray volumes.

Maximum Application Rates

Spray Volume Gallons/Acre	Maximum Rate of Alligare Triclopyr 3 Gallons per 100 gallons of spray volume		
	Grazed/Hayed Non- Cropland Sites ¹	Forestry Sites ²	Other Non- Cropland Sites ³
400	Do not use	0.5	0.75
300	Do not use	0.67	1
200	Do not use	1	1.5
100	0.67	2	3
50	1.33	4	6
40	1.67	5	7.5
30	2.33	6.65	10
20	3.33	10	15
10	6.67	20	30

¹For rights-of-ways, fence rows, or any area where grazing and haying is allowed, do not apply more than 2 lb a.e. of triclopyr (2/3 gallon of Alligare Triclopyr 3) per acre per year.

²For forestry uses, do not apply more than 6 lb a.e. of triclopyr (2 gallons of Alligare Triclopyr 3) per acre per year.

³For all terrestrial uses other than forestry sites, and grazed/hayed areas, a maximum of 9 lb a.e. of triclopyr (3 gallons of Alligare Triclopyr 3) per acre per year may be applied.

SPRAY ADDITIVES

All surfactants and drift control agents must be approved for food and feed use when used on food and feed sites.

Surfactants: When using surfactants, follow the use directions and precautions listed on the surfactant manufacturer's label. Use the higher recommended concentrations of surfactant in the spray mixture when applying lower sprayer volumes per acre.

Drift Control Agents: Agriculturally approved spray thickening drift control agents or high viscosity invert systems may be used with Alligare Triclopyr 3. When using these agents, follow all use directions and precautions on the product label. Do not use a thickening agent with the Microfoil boom, Thru-Valve boom, or other systems that cannot accommodate thick sprays.

TANK MIXES

Always refer to labels of other pesticide products for mixing directions and precautions which may differ from those outlined here. Use in accordance with the most restrictive of label limitations and precautions. No label dosage rates may be exceeded. This product cannot be mixed with any product containing a label prohibition against such mixing.

Tank Mixing Recommendations:

1. Fill spray tank 1/2 full with water.
2. Add spray thickening agent (if used).
3. Add additional herbicide (if used).
4. Add Alligare Triclopyr 3.
5. Add surfactant (if used).
6. Fill remainder of spray tank.

If combined with emulsifiable concentrate herbicides, moderate continuous adequate agitation is required.

SPRAY DRIFT MANAGEMENT

AVOID INJURIOUS DRIFT

Applications should only be made when there is little or no hazard from spray drift. Very small quantities of spray may seriously injure susceptible plants.

Avoiding spray drift at the application site is the responsibility of the applicator. The interaction of many equipment and weather related factors determine the potential for spray drift. The applicator and the grower are responsible for considering all these factors when making decisions.

The following drift management requirements must be followed to avoid off-target drift movement from aerial applications:

1. The distance of the outer most operating nozzles on the boom must not exceed 3/4 the length of the rotor.
2. Nozzles must always point backward parallel with the air stream and never be pointed downwards more than 45 degrees.

Where states have more stringent regulations, they must be observed.

The applicator should be familiar with and take into account the information covered in the following **AERIAL DRIFT REDUCTION ADVISORY**. [This information is advisory in nature and does not supersede mandatory label requirements.]

AERIAL DRIFT REDUCTION ADVISORY

Information on Droplet Size: The most effective way to reduce drift potential is to apply large droplets. The best drift management strategy is to apply the largest droplets that provide sufficient coverage and control. Applying larger droplets reduces drift potential, but will not prevent drift if applications are made improperly, or under unfavorable environmental conditions (see Wind, Temperature and Humidity, and Temperature Inversions).

Controlling Droplet Size:

1. **Volume** – Use high flow rate nozzles to apply the highest practical spray volume. Nozzles with higher rated flows produce larger droplets.
2. **Pressure** – Do not exceed the nozzle manufacturer's recommended pressures. For many nozzle types, lower pressure produces larger droplets. When higher flow rates are needed, use higher flow rate nozzles instead of increasing pressure.
3. **Number of Nozzles** – Use the minimum number of nozzles that provide uniform coverage.
4. **Nozzle Orientation** – Orienting nozzles so that the spray is released parallel to the air stream produces larger droplets than other orientations and is the recommended practice. Significant deflection from horizontal will reduce droplet size and increase drift potential.
5. **Nozzle Type** – Use a nozzle type that is designed for the intended application. With most nozzle types, narrower spray angles produce larger droplets. Consider using low-drift nozzles. Solid stream nozzles oriented straight back produce the largest droplets and the lowest drift.

Boom Length: For some use patterns, reducing the effective boom length to less than 3/4 of the wingspan or rotor length may further reduce drift without reducing swath width.

Application Height: Applications should not be made at a height greater than 10 feet above the top of the largest plants unless a greater height is required for aircraft safety. Making applications at the lowest height that is safe reduces exposure of droplets to evaporation and wind.

Swath Adjustment: When applications are made with a crosswind, the swath will be displaced downwind. Therefore, on the up and downwind edges of the field, the applicator must compensate for this displacement by adjusting the path of the aircraft upwind. Swath adjustment distance should increase, with increasing drift potential (higher wind, smaller drops, etc.)

Wind: Drift potential is lowest between wind speeds of 2-10 mph. However, many factors, including droplet size and equipment type, determine drift potential at any given speed. Applications should be avoided below 2 mph due to variable wind direction and high inversion potential. Note: Local terrain can influence wind patterns. Every applicator should be familiar with local wind patterns and how they affect spray drift.

Temperature and Humidity: When making applications in low relative humidity, set up equipment to produce larger droplets to compensate for evaporation. Droplet evaporation is most severe when conditions are both hot and dry.

Temperature Inversions: Applications should not occur during a local, low level temperature inversion because drift potential is high. Temperature inversions restrict vertical air mixing, which causes small suspended droplets to remain in a concentrated cloud. This cloud can move in unpredictable directions due to the light variable winds common during inversions. Temperature inversions are characterized by increasing temperatures with altitude and are common on nights with limited cloud cover and light to no wind. They begin to form as the sun sets and often continue into the morning. Their presence can be indicated by ground fog; however, if fog is not present, inversions can also be identified by the movement of the smoke from a ground source or an aircraft smoke generator. Smoke that layers and moves laterally in a concentrated cloud (under low wind conditions) indicates an inversion, while smoke that moves upward and rapidly dissipates indicates good vertical air mixing.

Sensitive Areas: The pesticide should only be applied when the potential for drift to adjacent sensitive areas (e.g., residential areas, bodies of water, known habitat for threatened or endangered species, non-target crops) is minimal (e.g., when wind is blowing away from the sensitive areas).

APPLICATION EQUIPMENT AND TECHNIQUES

BROADCAST APPLICATIONS

Aerial Application: When making aerial applications on rights-of-way or other areas near susceptible crops, apply through a Microfoil¹ or Thru-Valve¹ boom, or use an agriculturally approved drift control agent. Other drift reducing systems or thickened sprays prepared by using high viscosity inverting systems may be used if they are made as drift-free as are mixtures containing agriculturally approved thickening agents or applications made with the Microfoil or Thru-Valve boom. Keep spray pressures low enough to provide coarse spray droplets. Spray boom should be no longer than 3/4 of the rotor length. Spray only when the wind velocity is low (follow state regulations). Avoid application during air inversions. If a spray thickening agent is used, follow all use directions and precautions on the product label.

Note: Reference within this label to equipment produced by or available from other parties is provided without consideration for use by the reader at its discretion and subject to the reader's independent circumstances, evaluation, and expertise. Such reference by Alligare, LLC is not intended as an endorsement of such equipment, shall not constitute a warranty (express or implied) of such equipment, and is not intended to imply that other equipment is not available and equally suitable. Any discussion of methods of use of such equipment does not imply that the reader should use the equipment other than as advised in directions available from the equipment's manufacturer. The reader is responsible for exercising their own judgment and expertise, or consulting with sources other than Alligare, LLC, in selecting and determining how to use its equipment.

Ground Application: To aid in reducing spray drift, Alligare Tricopyr 3 should be applied in thickened (high viscosity) spray mixtures using an agriculturally approved drift control additive, high viscosity invert system, or equivalent as directed by the manufacturer. Use of low pressure nozzles; and operating nozzles in the lower end of the manufacturer's recommendations is advised. To minimize drift, keep the spray boom as low as possible, apply in ≥ 20 gallons of spray volume per acre, spray when wind velocities are low; or use an approved drift control agent.

In Hand Gun Applications, select the minimum spray pressure that will provide adequate plant coverage (without forming a mist). Do not apply with nozzles that produce a fine droplet spray.

High Volume Leaf-Stem Treatment: To minimize spray drift, do not use pressure exceeding 50 PSI at the spray nozzle and keep sprays no higher than brush tops. An agriculturally approved thickening agent may be used to reduce spray drift.

APPROVED USES

Refer to Tables 1 and 2 for lists of woody plants and broadleaf weeds that are controlled by Alligare Tricopyr 3.

Apply Alligare Tricopyr 3 at rates of 0.25 to 3 gallons per acre for the control of broadleaf weeds and woody plants. Apply in enough water to provide uniform and complete coverage of the plants to be controlled. Use only water suitable for spraying. Use of an agriculturally approved nonionic surfactant is recommended for all foliar applications. For best results make applications when woody plants and weeds are actively growing.

Use higher rates within the range when brush averages 15 feet or more in height or when brush covers $>60\%$ of the area to be treated. Re-sprouting may occur the year following treatment if lower rates are used on hard-to-control species. When easy to control brush species dominate, rates below those specified may be effective. Consult State or Local Extension personnel for information.

For hard-to-control species such as ash, black gum, choke cherry, elm, maples, oaks, pines, or winged elm; during late summer applications

when plants are mature; or during drought conditions; use higher rates of Alligare Triclopyr 3 alone or use in combination with Tordon 101 Mixture. If lower rates are used on hard-to-control species, re-sprouting may occur in the year following treatment.

When applying Alligare Triclopyr 3 in a tank mix with 2, 4-D 3.8 lb amine, like DMA 4 IVM, or low volatile ester herbicides, use higher rates of Alligare Triclopyr 3 for satisfactory brush control.

When tank mixing, refer to the individual product labels for precautionary statements, restrictions, application rates, approved uses, and a list of weeds and woody plants controlled.

FOLIAGE APPLICATIONS WITH GROUND EQUIPMENT

High Volume Foliage Applications

For control of woody plants, apply Alligare Triclopyr 3 at 1 to 3 gallons per 100 gallons of spray solution. Make applications in 100 to 400 gallons of total spray per acre depending on size and density of woody plants. Coverage should be thorough to wet all leaves, stems, and root collars.

Tank Mixing: 1 to 4 quarts of Alligare Triclopyr 3 may be tank mixed with 1 to 2 quarts of 2, 4-D 3.8 lb amine, like DMA 4 IVM, or low volatile ester or Tordon 101 Mixture diluted to make 100 gallons of spray solution. Make applications in 100 to 400 gallons of total spray per acre depending on size and density of woody plants. When tank mixing, refer to the individual product labels for precautionary statements, restrictions, application rates, approved uses, and a list of weeds and woody plants controlled.

Do not exceed maximum allowable use rates per acre. See Rate Table in the Rates Section of **APPLICATION DIRECTIONS**.

Low Volume Foliage Applications

For control of woody plants, mix up to 5 gallons of Alligare Triclopyr 3 in 10 to 100 gallons of spray solution. Adjust the spray concentration of Alligare Triclopyr 3 and total spray volume per acre to match the size and density of target woody plants and kinds of spray equipment used. With low volume sprays, use sufficient spray volume to obtain uniform coverage of target plants including the surfaces of all foliage, stems, and root collars. For best results, a surfactant should be added to all spray mixtures. See the **SPRAY ADDITIVES** section of **APPLICATION DIRECTIONS**.

Match equipment and delivery rate of spray nozzles to height and density of woody plants. When treating tall, dense brush, a truck mounted spray gun with spray tips that deliver up to 2 gallons per minute at 40 to 60 PSI may be required. Backpack or other types of specialized spray equipment with spray tips that deliver less than 1 gallon of spray per minute may be appropriate for short, low to moderate density brush.

Tank Mixing: Up to 3 gallons of Alligare Triclopyr 3 may be applied in tank mix combinations with 2 to 4 quarts of Tordon K or 1 to 2 gallons of Tordon 101 Mixture as a low volume foliar spray. These applications should be made in 10 to 100 gallons of spray solution. When tank mixing, refer to the individual product labels for precautionary statements, restrictions, application rates, approved uses, and a list of weeds and woody plants controlled.

BROADCAST APPLICATION WITH GROUND EQUIPMENT

Use equipment that will assure thorough and uniform coverage at spray volumes applied. To improve spray coverage, add an agriculturally approved nonionic surfactant. See the **SPRAY ADDITIVES** section of **APPLICATION DIRECTIONS**. See **Maximum Application Rates Table** in the **APPLICATION DIRECTIONS** for relationship between mixing rate, spray volume, and maximum application rate.

Woody Plant Control

Foliage Treatment: Apply 2 to 3 gallons of Alligare Triclopyr 3 in 20 to 100 gallons of spray solution per acre.

Tank Mixing: Alligare Triclopyr 3 at 2 to 4 quarts per acre may be tank mixed with 1 to 2 gallons of 2,4-D 3.8 lb amine, like DMA 4 IVM, or low volatile esters or Tordon 101 Mixture in 20 to 100 gallons of spray solution per acre. When tank mixing, refer to the individual product labels for precautionary statements, restrictions, application rates, approved uses, and a list of weeds and woody plants controlled.

Broadleaf Weed Control

Apply 1.3 to 6 quarts of Alligare Triclopyr 3 in 20 to 100 gallons of spray solution per acre. Apply any time during the growing season.

Tank Mixing: Alligare Triclopyr 3 at 1.3 to 4 quarts per acre may be tank mixed with 2 to 4 quarts of Tordon K; Tordon 101 Mixture, or 2,4-D 3.8 lb amine, like DMA 4 IVM, or low volatile ester to improve the spectrum of activity. When tank mixing, refer to the individual product labels for precautionary statements, restrictions, application rates, approved uses, and a list of weeds and woody plants controlled.

AERIAL APPLICATION (HELICOPTER ONLY)

Aerial sprays should be applied using suitable drift control. See the **SPRAY DRIFT MANAGEMENT** section for drift control advice. Add an agriculturally approved nonionic surfactant. See the **SPRAY ADDITIVES** and the **APPLICATION EQUIPMENT AND TECHNIQUES** section. See **Maximum Application Rates Table** in the **APPLICATION DIRECTIONS** for relationship between mixing rate, spray volume, and maximum application rate.

FOLIAGE TREATMENT (RIGHTS-OF-WAY)

Apply 2/3 gallon of Alligare Triclopyr 3 per acre alone or tank mix with 1 to 2 gallons of 2,4-D 3.8 lb amine, like DMA 4 IVM, or low volatile esters; or Tordon 101 Mixture. Apply in total spray volume of 1 to 30 gallons per acre.

When tank mixing, refer to the individual product labels for precautionary statements, restrictions, application rates, approved uses, and a list of weeds and woody plants controlled.

FOREST MANAGEMENT APPLICATIONS

For broadcast applications, apply the specified rate of Alligare Triclopyr 3 in 1 to 25 gallons per acre by air or in 10 to 100 gallons per acre by ground. Use sufficient spray volumes to provide thorough plant coverage. To improve spray coverage at volumes less than 50 gallons per acre, add an agriculturally approved nonionic surfactant. See the **SPRAY ADDITIVES** section of **APPLICATION DIRECTIONS**. Use application systems designed to prevent spray drift to off-target sites. Nozzles or additives used for drift minimization that produce larger droplets may require higher spray volumes to provide brush control. See **APPLICATION EQUIPMENT AND TECHNIQUES** section.

Forest Site Preparation (Not For Conifer Release)

To control susceptible woody plants and broadleaf weeds, apply up to 2 gallons per acre of Alligare Triclopyr 3 in a total spray solution of 1 to 30 gallons per acre. Alligare Triclopyr 3 may be applied at a rate of 1 to 1.5 gallons per acre in a tank mix combination with 1 to 2 gallons of Tordon 101 Mixture or 2,4-D 3.8 lb low volatile ester to broaden the spectrum of woody plants and broadleaf weeds controlled. Use of a nonionic agricultural surfactant is recommended for all foliar applications. See the **SPRAY ADDITIVES** section of **APPLICATION DIRECTIONS**.

Refer to the individual product labels for precautionary statements, restrictions, application rates, approved uses, and a list of weeds and woody plants controlled.

Conifer Plant Back Interval: Conifer injury may occur if conifers are planted sooner than 1 month after Alligare Triclopyr 3 treatments at rates <1-1/3 gallon per acre; or if conifers are planted sooner than 2 months after treatment with rates of 1-1/3 to 3 gallons per acre. When herbicide

tank mixtures are used for forest site preparation, use the longest plant back waiting period listed on any tank mix partner.

Direct Spray Applications for Conifer Release

To release conifers from competing hardwoods such as red maple, sugar maple, striped maple, sweetgum, red and white oaks, ash, hickory, alder, birch, aspen, and pin cherry, mix 1 to 2 gallons of Alligare Triclopyr 3 in enough water to make 100 gallons of spray mixture. To improve spray coverage, add an agriculturally approved nonionic surfactant. See the **SPRAY ADDITIVES** section of **APPLICATION DIRECTIONS**.

Direct the spray onto foliage of competitive hardwoods using knapsack or backpack sprayers with flat fan nozzles or equivalent. Make applications any time after the hardwoods have reached full leaf size, but before autumn coloration. The majority of treated hardwoods should be less than 6 feet in height to ensure adequate spray coverage. Care should be taken to direct the spray solution away from conifer foliage, particularly foliage of desirable pines.

Conifer Release Applications: Spray may cause temporary damage and growth suppression of conifers where direct contact occurs; however, injured conifers should recover and grow normally. **Over-the-top spray applications can kill pines.**

Broadcast Application for Conifer Release in the Northeastern United States

To release spruce, fir, red pine, and white pine from competing hardwoods such as red maple, sugar maple, striped maple, alder, birch (white, yellow, and grey), aspen, ash, pin cherry, and *Rubus* spp. and perennial and annual broadleaf weeds, apply Alligare Triclopyr 3 at 2 to 4 quarts per acre alone or in a tank mix with 2,4-D amine, like DMA 4 IVM, or 2,4-D low volatile ester. Apply no more than 4 pounds acid equivalent per acre from the combined products. Make applications in late summer or early fall after conifers have formed their over-wintering buds; and hardwoods are in full leaf prior to autumn coloration.

Broadcast Applications for Douglas Fir Release in the Pacific Northwest and California

To release Douglas fir from competing vegetation such as broadleaf weeds, alder, blackberry or Scotch broom, apply Alligare Triclopyr 3 at 1-1/3 to 2 quarts per acre alone or in combination with 4 lb per acre of atrazine. Add a nonionic surfactant to the spray solution. See the **SPRAY ADDITIVES** section of **APPLICATION DIRECTIONS**. Applications should be made in early spring after hardwoods begin growth **and before** Douglas fir bud break ("early foliar" hardwood stage). Applications can also be made in late summer, after Douglas fir seasonal growth has "hardened off" (winter bud set). Make applications while hardwoods are still actively growing. When treating after Douglas fir winter bud set, apply prior to onset of hardwood autumn coloration.

Note: Treatments applied during active Douglas fir shoot growth (after spring bud break and prior to winter bud set), may cause injury to Douglas fir trees.

Cut Surface Treatments

To control hardwood unwanted species such as elm, maple, oak; and conifers in rights-of-way and other noncrop areas, apply Alligare Triclopyr 3, either undiluted or diluted in a 1:1 ratio with water by one of the following methods:

Tree Injector Method: Inject 1/2 milliliter (ml) of undiluted Alligare Triclopyr 3 or 1 ml of the diluted (1:1) solution through the bark at intervals of 3-4 inches between injection wounds. The tree injections should completely surround the tree at any convenient height.

Note: Worker Protection Standard **AGRICULTURAL USE REQUIREMENTS** reentry restrictions do not apply for this application method. Refer to the **NON-AGRICULTURAL USE REQUIREMENTS** box.

Hack and Squirt Method: Use a hatchet or similar equipment to make cuts in the bark at intervals of 3-4 inches at a convenient height around the circumference of the tree trunk. Spray 1/2 milliliter (ml) of undiluted Alligare Triclopyr 3 or 1 ml of the diluted (1:1) solution into each cut.

Frill or Girdle Method: Make a single girdle through the bark completely around the tree at a convenient height. Wet the cut surface with undiluted Alligare Triclopyr 3 or the diluted (1:1) solution.

Both the **Hack and Squirt Method** and the **Frill or Girdle Method** may be successfully used during any season except during periods of heavy sap flow of certain species such as maples.

Stump Treatment: Spray or paint undiluted Alligare Triclopyr 3 on to the freshly cut surfaces of cut stumps and stubs. The cambium area next to the bark is the most vital area to wet.

Table 1
Woody Plants Controlled by Alligare Triclopyr 3

Alder	Maleleuca (seedlings)
Arrowwood	Maples
Ash	Mulberry
Aspen	Oaks
Bear Clover (Bearmat)	Persimmon
Beech	Pine
Birch	Poison Ivy
Blackberry	Poison Oak
Black gum	Poplar
Brazilian Pepper	Salmonberry
Cascara	Salt-bush (<i>Braccharis</i> spp.)
Ceanothus	Salt cedar ²
Cherry	Sassafras
Chinese Tallow	Scotch Broom
Chinquapin	Sumac
Choke Cherry	Sweetbay Magnolia
Cottonwood	Sweet Gum
<i>Crataegus</i> (hawthorn)	Sycamore
Dogwood	Tan Oak
Douglas fir	Thimbleberry
Elderberry	Tulip Poplar
Elm	Wax Myrtle
Gallberry	Western Hemlock
Hazel	Wild Rose
Hornbeam	Willow
Kudzu ¹	Winged elm
Locust	
Madrone	

¹For complete control, retreatment may be necessary.

²Use cut surface treatments for best results.

Table 2
Annual and Perennial Broadleaf Weeds
Controlled by Alligare Triclopyr 3

Bindweed	Plantain
Burdock	Purple Loosestrife
Canada Thistle	Ragweed
Chicory	Smartweed
Curly Dock	Tansey Ragwort
Dandelion	Tropical Soda apple
Elephant Ear	Vetch
Field Bindweed	Wild Lettuce
Lambsquarter	
Ligodium	

WETLAND SITES IN PRODUCTION FORESTS AND INDUSTRIAL NON-CROP AREAS

Alligare Triclopyr 3 may be used in wetlands within forests; wildlife habitat restoration, wildlife management areas, and industrial non-crop sites; as well as areas adjacent to or surrounding domestic water supply reservoirs, lakes and ponds to control target vegetation in and around standing water sites, such as flood plains, delta, marshes, wetlands, swamps, bogs, and transitional areas between upland and lowland sites, and the banks of ponds and lakes and transition areas between upland and lowland sites.

For control of woody plants and broadleaf weeds in these sites, follow use directions and application methods on this label for **FOREST MANAGEMENT APPLICATIONS**. Refer to Tables 1 and 2 (above) for lists of woody plants and broadleaf weeds that are controlled by Alligare Triclopyr 3.

Use Restrictions and Precautions for Wetland Sites

- Refer to the **USE PRECAUTIONS** and **USE RESTRICTIONS** section for additional restrictions and precautions.
- **Minimize overspray to open water** when treating target vegetation in and around non-flowing, quiescent or transient water. When making applications to control unwanted plants on banks or shorelines of flowing water, minimize over spray to open water.
- **Obtain Required Permits:** Before applying this product in and around public water, consult appropriate local public water control authorities. Permits may be required to treat such areas.
- **Recreational Use of Water in the Treatment Area:** There are no restrictions on water use in the treatment area for recreational purposes, including swimming and fishing.
- **Livestock Use of Water from Treatment Area:** There are no restrictions on consumption of water from treated areas by livestock.

Purple Loosestrife (*Lythrum salicaria*)

Purple loosestrife can be controlled with broadcast foliar applications of Alligare Triclopyr 3 at a minimum of 6 to 8 quarts per acre. Apply when purple loosestrife is at the bud to mid-flowering stage of growth. Follow-up applications for control of regrowth should be made the following year to achieve increased control of this weed species. For all applications, add a nonionic surfactant labeled for aquatics to the spray mixture.

Follow all directions and use precautions on the surfactant label.

Thorough wetting of the foliage and stems is necessary to achieve satisfactory control. A minimum spray volume of 50 gallons per acre is recommended for ground broadcast applications.

For backpack applications, a spray solution of 1 to 1.5% Alligare Triclopyr 3 (5 to 7.6 fl oz of Alligare Triclopyr 3 per 4 gallons of water) should be used. All purple loosestrife plants should be thoroughly wetted.

Aerial application by helicopter may be needed when treating restoration sites that are inaccessible, remote, difficult to traverse, isolated, or otherwise unsuited to ground application, or in circumstances where invasive exotic weeds dominate native plants populations over extensive areas and efforts to restore native plant diversity are being conducted. By air, apply in a minimum spray volume of 30 gallons per acre using Thru-Valve or Microfoil boom only.

Terrestrial Sites Associated with Wetland Areas

Refer to Tables 1 and 2 (above) for a list of woody plants and broadleaf weeds that are controlled by Alligare Triclopyr 3.

Apply Alligare Triclopyr 3 at rates of 0.25 to 2 gallons per acre for the control of broadleaf weeds and woody plants. Apply in enough water to provide uniform and complete coverage of the plants to be controlled. Use only water suitable for spraying. Use of an agriculturally approved nonionic surfactant is recommended for all foliar applications. Refer to

SPRAY ADDITIVES in the **APPLICATION DIRECTIONS** section. Refer to **TANK MIXES** in the **APPLICATION DIRECTIONS** section for the order of addition of surfactants. For best results make applications when woody plants and weeds are actively growing.

Use higher rates within the range when brush averages 15 feet or more in height or when brush covers >60% of the area to be treated. Re-sprouting may occur the year following treatment if lower rates are used on hard-to-control species.

For hard-to-control species such as ash, black gum, choke cherry, maples, or oaks; during late summer applications when plants are mature; or during drought conditions; use higher rates of Alligare Triclopyr 3 alone or use in combination with a 2,4-D approved for aquatic use, such as DMA 4 IVM, generally the higher rates should be used for satisfactory brush control. When tank mixing, refer to the individual product labels for precautionary statements, restrictions, application rates, approved uses, and a list of weeds and woody plants controlled.

High Volume Foliage Applications

For control of woody plants, apply Alligare Triclopyr 3 at 1 to 2 gallons per 100 gallons of spray solution. Make applications in 100 to 400 gallons of total spray per acre depending on size and density of woody plants. Coverage should be thorough to wet all leaves, stems, and root collars.

Tank Mixing: 1 to 4 quarts of Alligare Triclopyr 3 may be tank mixed with 1 to 2 quarts of 2, 4-D 3.8 lb amine, like DMA 4 IVM, diluted to make 100 gallons of spray solution. Make applications in 100 to 400 gallons of total spray per acre depending on size and density of woody plants. When tank mixing, refer to the individual product labels for precautionary statements, restrictions, application rates, approved uses, and a list of weeds and woody plants controlled.

Low Volume Foliage Applications

For control of woody plants, mix up to 5 gallons of Alligare Triclopyr 3 in 10 to 100 gallons of spray solution. Adjust the spray concentration of Alligare Triclopyr 3 and total spray volume per acre to match the size and density of target woody plants and kinds of spray equipment used. With low volume sprays, use sufficient spray volume to obtain uniform coverage of target plants including the surfaces of all foliage, stems, and root collars. For best results, a labeled aquatic surfactant should be added to all spray mixtures.

Match equipment and delivery rate of spray nozzles to height and density of woody plants. When treating tall, dense brush, a truck mounted spray gun with spray tips that deliver up to 2 gallons per minute at 40 to 60 PSI may be required. Backpack or other types of specialized spray equipment with spray tips that deliver less than 1 gallon of spray per minute may be appropriate for short, low to moderate density brush.

Cut Surface Treatments (Woody Plants)

To control unwanted trees and other listed woody plants in Table 1 (above), apply Alligare Triclopyr 3, either undiluted or diluted in a 1:1 ratio with water by one of the following methods:

Tree Injector Method: Inject 1/2 milliliter (ml) of undiluted Alligare Triclopyr 3 or 1 ml of the diluted (1:1) solution through the bark at intervals of 3-4 inches between injection wounds. The tree injections should completely surround the tree at any convenient height.

Note: Worker Protection Standard **AGRICULTURAL USE REQUIREMENTS** reentry restrictions do not apply for this application method. Refer to the **NON-AGRICULTURAL USE REQUIREMENTS** box.

Hack and Squirt Method: Use a hatchet or similar equipment to make cuts in the bark at intervals of 3-4 inches at a convenient height around the circumference of the tree trunk. Spray 1/2 milliliter (ml) of undiluted Alligare Triclopyr 3 or 1 ml of the diluted (1:1) solution into each cut.

Frill or Girdle Method: Make a single girdle through the bark completely around the tree at a convenient height. Wet the cut surface with undiluted Alligare Triclopyr 3 or the diluted (1:1) solution.

Both the **Hack and Squirt Method** and the **Frill or Girdle Method** may be successfully used during any season except during periods of heavy sap flow of certain species such as maples.

Stump Treatment: Spray or paint undiluted Alligare Triclopyr 3 on to the freshly cut surfaces of cut stumps and stubs. The cambium area next to the bark is the most vital area to wet.

CHRISTMAS TREE PLANTATIONS

Alligare Triclopyr 3 is used to control unwanted woody plants and annual and perennial broadleaf weeds in established Christmas tree plantations. For best results, make applications when woody plants and weeds are actively growing. Alligare Triclopyr 3 only controls weeds which are emerged at the time of application.

Brush >8 feet tall is difficult to treat efficiently using hand equipment such as backpack or knapsack sprayers. Use higher rates of Alligare Triclopyr 3 or use cut surface application methods when treating large brush or trees; hard to control species such as ash, black gum, choke cherry, elm, hazel, madrone, maples, oaks or sweetgum; for applications made during drought conditions; or late summer applications when the leaves are mature. For foliar applications, apply in enough water to provide uniform and complete coverage of the plants to be controlled. Applications made under drought conditions may provide less than desirable results. Re-sprouting may occur the year following treatment if lower rates are used on hard-to-control species.

Use Restrictions and Precautions for Christmas Tree Plantations

- Do not tank mix with 2,4-D for use in Christmas tree plantations.
- Only apply Alligare Triclopyr 3 to **established** Christmas trees that have been **planted at least one full year** prior to application.
- To prevent Christmas tree injury, take care to direct spray away from Christmas tree foliage to avoid contact.
- Do not use on newly seeded grass until well established as indicated by vigorous growth and development of secondary root system and tillering.
- Mow newly seeded turf (alleysways, etc.) two or three times before treatment with Alligare Triclopyr 3.
- Do not reseed Alligare Triclopyr 3 treated Christmas tree areas within three weeks after application.
- Do not use Alligare Triclopyr 3 if legumes, such as clover, are present and injury cannot be tolerated.

Spray Solution Preparation

Refer to the **TANK MIXES** section of **APPLICATION DIRECTIONS** for order of addition to the spray tank. Continue moderate agitation while mixing and spraying. Use of a nonionic agricultural surfactant is recommended for all applications. See the **SPRAY ADDITIVES** section of **APPLICATION DIRECTIONS** for surfactant recommendations.

Application

Make applications in late summer or early autumn after terminal growth of Christmas trees has hardened off, but before leaf drop of target plants. Apply 2 to 5 pints per acre of Alligare Triclopyr 3 as a foliar spray directed toward the base of Christmas trees. Use sufficient spray volume (20 to 100 gallons per acre) to provide uniform coverage of target plants. Specified application rates of Alligare Triclopyr 3 (see Table 3, below) will only suppress some well established woody plants that are 2 to 3 years old. Broadcast sprays may also be applied in bands between the rows of planted trees. Select spray equipment that will provide uniform coverage at the desired spray volume.

Alligare Triclopyr 3 spray solution can cause Christmas tree needle and branch injury. To minimize Christmas tree injury, direct sprays to minimize

Christmas tree foliage contact. White pine and Douglas fir are more susceptible to injury than blue spruce, white spruce, balsam fir and Fraser fir. Refer to the **Use Restrictions and Precautions for Christmas Tree Plantations**.

Directed Applications

For control of hardwoods such as red maple, sugar maple, striped maple, sweetgum, red and white oaks, ash, alder, birch, aspen, and pin cherry; mix 4 to 20 fluid ounces of Alligare Triclopyr 3 in enough water to make 3 gallons of spray solution. For directed applications, do not exceed 2 gallons of Alligare Triclopyr 3 per acre per year. To improve coverage, add a nonionic agricultural surfactant to the spray. See the **SPRAY ADDITIVES** section of **APPLICATION DIRECTIONS** for surfactant recommendations. Direct this spray mixture onto foliage of competitive hardwoods using knapsack or backpack sprayers with flat fan (or equivalent) nozzles any time after hardwoods have reached full leaf size, but before autumn coloration (when plants are actively growing). The majority of treated hardwoods should be <8 feet in height to ensure adequate spray coverage.

Cut Surface Treatments

Use cut surface treatments when treating large brush and trees; hard to control species such as ash, blackgum, choke cherry, elm, hazel, madrone, maples, oaks, salt cedar or sweetgum; for applications during drought conditions; or for late summer applications when the leaves are mature. Refer to the Cut Surface Treatments in the Forest Management section for use directions.

Table 3
Christmas Tree Plantation
Application Rates and Species Controlled

Alligare Triclopyr 3		
2 pints per acre	3 to 4 pints per acre	5 pints per acre
Clover	Bindweed, Field ¹	Arrowwood ⁴
Dandelion	Blackberry ²	Aspen
Dock, Curly	Chicory ³	Beech ⁴
Lambsquarter	Fireweed	Birch ⁴
Lespedeza	Ivy, Ground	Chinquapin
Plantain, Broadleaf	Lettuce, Wild	Cottonwood ⁴
Plantain, Buckhorn	Oxalis	Elderberry
Ragweed, Common	Poison Ivy	Grape, Wild
Vetch	Smartweed ¹	Mulberry ⁴
	Thistle, Canada ¹	Poplar ⁴
	Violet, Wild	Sassafras ⁴
	Virginia Creeper ²	Sumac ⁴
		Sycamore ⁴

¹Top growth control, retreatment may be necessary

²Use 4 pints per acre.

³Suppression

⁴Seedlings less than 2-3 years old

CHEMICAL MOWING ON NON-CROPLAND SITES INFESTED WITH ANNUAL AND PERENNIAL BROADLEAF WEEDS OR WOODY PLANTS*

*Not approved for this use in California

Apply Alligare Triclopyr 3 to the cut surfaces of weed or brush stubble under the deck of a rotary mower such as the Lucas "64" System or other approved equipment that is designed to uniformly apply the herbicide. Use this method of application for control of annual and perennial broadleaf weeds and for suppression and stem density reduction of woody plants that occur on rights-of-way, airport grounds, petroleum tank farms or other industrial sites. Apply when growing conditions are favorable and there is active plant growth.

Broadleaf Weed Control: Apply this product at labeled rates under the section Broadcast Application with Ground Equipment, Broadleaf Weed

Control. Apply in a minimum spray volume of 3 gallons per acre. Follow label directions for herbicides that may be applied in tank mix combination with this product to improve weed control or broaden the spectrum of weeds controlled.

Woody Plant Control: For suppression and stem density reduction of woody species, use 3 to 6 quarts of Alligare Triclopyr 3 in a minimum spray volume of 5 gallons per acre. Follow label directions for herbicides that may be applied in tank mix combination with this product to improve woody plant control or broaden the spectrum of woody plants controlled.

AQUATIC SITES

Alligare Triclopyr 3 can be used to control emerged, submersed, and floating aquatic plants in aquatic sites such as ponds, lakes, reservoirs, non-irrigation canals, and ditches (with little or no continuous outflow), marshes, and wetlands. Alligare Triclopyr 3 can also be used to control broadleaf and woody vegetation on banks and shores within or adjacent to these and other aquatic sites.

Aquatic Weeds Controlled by Alligare Triclopyr 3

Alligatorweed	Milfoil species	Purple loosestrife
American lotus	Nuphar (spatterdock)	Waterhyacinth
American frogbit	Parrotfeather ¹	Waterlily
Aquatic soda apple	Pickerselweed	Waterprimrose
Eurasian watermilfoil	Pennywort	

¹Retreatment may be needed to achieve desired level of control.

Use Restrictions and Precautions for Aquatic Sites

- Refer to the **USE PRECAUTIONS** and **USE RESTRICTIONS** section of this label for additional precautions and restrictions.
- **Obtain Required Permits:** Before applying this product to public waters, consult with appropriate state or local water authorities. State or local public agencies may require permits.
- Do not use treated water for irrigation for 120 days following application. As an alternative to waiting 120 days, treated water may be used for irrigation once the level of triclopyr in the intake water is determined to be non-detectable by laboratory analysis (immunoassay). There is no restriction on use of water from the treatment area to irrigate established grasses.
- **Recreational Use of Water in the Treatment Area:** There are no restrictions on water use in the treatment area for recreational purposes, including swimming and fishing.
- **Livestock Use of Water from Treatment Area:** There are no restrictions on consumption of water from treated areas by livestock.

Floating and Emerged Aquatic Weeds

Surface Application: Use a spray boom, handgun or other similar suitable equipment mounted on a boat or vehicle. Thorough wetting of foliage is essential for maximum effectiveness. Use 20 to 200 gallons per acre of spray mixture. Special precautions such as the use of low spray pressure, large droplet producing nozzles or addition of a labeled thickening agent may minimize spray drift in areas near sensitive crops.

Aerial Application (Helicopter only): Apply using a Microfoil, Thru-Valve boom, or a drift control additive in the spray solution. Apply in a minimum of 1 gallon of total spray solution per acre. Do not apply when weather conditions favor drift to sensitive areas. See the **SPRAY DRIFT MANAGEMENT** section for drift control advice.

Apply 0.5 to 2 gallons of Alligare Triclopyr 3 per acre as a foliar application for control of waterhyacinth, alligatorweed (see specific directions below), and other susceptible emerged and floating herbaceous weeds and woody plants. Make applications using surface or aerial equipment. Use higher rates in the rate range when plants are mature, when the weed mass is dense, or for difficult to control species. Repeat treatments may be necessary to control regrowth and weeds which escaped spray, but do not apply more than 2 gallons of Alligare Triclopyr 3 per acre per annual growing season. Make applications when plants are actively growing.

Use of a nonionic surfactant in the spray solution is recommended to improve control. Follow all directions and use precautions on the aquatic surfactant label.

Floating and Emerged Weed Control – Alligare Triclopyr 3 Rates

Weed Species	Scientific Name	Gallons Per Acre	Application Timing and Remarks
Waterhyacinth	<i>Eichhornia crassipes</i>	0.5 – 2	Apply when plants are actively growing. Use the higher rate when the weed mass is dense. Thoroughly wet all foliage. Repeat treatments may be needed to control regrowth or escaped plants.
Alligatorweed	<i>Alternanthera philoxeroides</i>	0.75 – 2	Thoroughly wet all foliage. Weeds growing outside the margins of a body of water can be controlled. Alligatorweed growing in water will be only partially controlled. Top growth above water will be controlled, but plants will likely regrow from underwater tissue. Use a nonionic aquatic surfactant for best results.

Potable Water Intake Setbacks for Control of Floating and Emerged Weeds – Lakes, Reservoirs, or Ponds

Minimum setback distances from functioning potable water intakes for human consumption for the application of Alligare Triclopyr 3 must be observed when controlling floating and emerged weeds in lakes, reservoirs or ponds. These setback restrictions do not apply to terrestrial applications made adjacent to potable water intakes. Existing potable water intakes which are no longer in use are not considered to be functioning and these setback restrictions do not apply. Examples of this would be potable water intakes replaced by potable water wells or connections to a municipal water system.

The following table provides the minimum setback distances based on the Alligare Triclopyr 3 rate and the area treated for floating and emerged weed control.

Potable Water Intake Setback Distances for Application of Alligare Triclopyr 3 for Control of Floating and Emerged Weeds in Lakes, Reservoirs, or Ponds

Minimum Setback Distances (feet)				
ALLIGARE TRICLOPYR 3 Rate (quarts/acre)				
Area Treated (acres)	2	4	6	8
<4	0	200	400	500
>4 – 8	0	200	700	900
>8 – 16	0	200	700	1000
>16	0	200	900	1300

Alligare Triclopyr 3 can be applied around functioning potable water intakes or closer than these setback distances as long as the intake is turned off until the level of triclopyr in the intake water is determined to be less than or equal to 0.4 parts per million (ppm) as determined by laboratory analysis or immunoassay.

Submerged Weeds – Control of Eurasian Watermilfoil and other Susceptible Species

Subsurface Application: Alligare Triclopyr 3 can be applied directly into the water through boat-mounted distribution systems. Subsurface application may be desirable near areas of susceptible crops or other desirable broadleaf plants to avoid spray drift. Refer to the Rate Table below to determine the desired amount.

Surface Application: Alligare Triclopyr 3 can be applied either as a concentrate or as a spray solution diluted in water. Use a minimum spray volume of 5 gallons per acre. Do not apply when weather conditions favor drift to sensitive areas. See the **SPRAY DRIFT MANAGEMENT** section for drift control advice.

Apply 0.75 to 2.5 ppm acid equivalent (a.e.) of Alligare Triclopyr 3 for control of Eurasian watermilfoil (*Myriophyllum spicatum*) and other susceptible submerged weeds in ponds, lakes, reservoirs, and in non-irrigation canals or ditches that have little or no continuous outflow. Make applications using surface or subsurface application. Use higher rates within the rate range in areas of greater water exchange. Repeat treatments may be necessary, but do not apply more than 2.5 ppm acid equivalent of Alligare Triclopyr 3 per acre per annual growing season. Refer to following table to determine the desired amount.

Make applications in spring or early summer when Eurasian watermilfoil or other submersed weeds are actively growing.

Alligare Triclopyr 3 Rates for Control of Submerged Weeds in Ponds, Lakes, Reservoirs, and in Non-irrigation Canals or Ditches

Concentration of Triclopyr Acid Equivalent in Water (ppm a.e.)					
Alligare Triclopyr 3 gallons per surface area at specified depth					
Water Depth (feet)	0.75 ppm	1 ppm	1.5 ppm	2 ppm	2.5 ppm
1	0.7	0.9	1.4	1.8	2.3
2	1.4	1.8	3.3	3.6	4.6
3	2.1	2.9	4.1	5.4	6.8
4	2.7	3.6	5.4	7.2	9.1
5	3.4	4.5	6.8	9.0	11.3
6	4.1	5.4	8.1	10.9	13.6
7	4.8	6.3	9.5	12.7	15.8
8	5.5	7.2	10.9	14.5	18.1
9	6.1	8.1	12.2	16.3	20.4
10	6.8	9.0	13.6	18.1	22.6
15	10.2	13.6	20.4	27.2	33.9
20	13.6	18.1	27.2	36.2	45.3

Potable Water Intake Setbacks for Control of Submerged Weeds – Lakes, Reservoirs, or Ponds

Minimum setback distances from functioning potable water intakes for human consumption for the application of Alligare Triclopyr 3 must be observed when controlling submerged weeds in lakes, reservoirs or ponds. These setback restrictions do not apply to terrestrial applications made adjacent to potable water intakes. Existing potable water intakes which are no longer in use are not considered to be functioning and these setback restrictions do not apply. Examples of this would be potable water intakes replaced by potable water wells or connections to a municipal water system.

The following table provides the minimum setback distances based on the Alligare Triclopyr 3 rate and the area treated for submerged weed control.

Potable Water Intake Setback Distances for Application of Alligare Triclopyr 3 for Control of Submerged Weeds in Lakes, Reservoirs, or Ponds

Minimum Setback Distances (feet)					
Area Treated (acres)	Concentration of Triclopyr Acid Equivalent in Water (ppm a.e.)				
	0.75 ppm	1 ppm	1.5 ppm	2 ppm	2.5 ppm
<4	300	400	600	800	1000
>4 – 8	420	560	840	1120	1400
>8 – 16	600	800	1200	1600	2000
>16 – 32	780	1040	1560	2080	2600
> 32 acres, calculate the minimum setback distance using formula given for chosen application rate	Setback (ft) = $\frac{[800 \times \text{In (acres)}] - 160}{3.33}$	Setback (ft) = $\frac{[800 \times \text{In (acres)}] - 160}{2.5}$	Setback (ft) = $\frac{[800 \times \text{In (acres)}] - 160}{1.67}$	Setback (ft) = $\frac{[800 \times \text{In (acres)}] - 160}{1.25}$	Setback (ft) = $\frac{[800 \times \text{In (acres)}] - 160}{1}$

Example Calculations:

To apply Alligare Triclopyr 3 at 2.5 PPM a.e. to 50 acres:

$$\begin{aligned} \text{Setback in feet} &= [800 \times \text{In (50 acres)}] - 160 \\ &= [800 \times 3.912] - 160 \\ &= 2970 \text{ feet} \end{aligned}$$

To apply Alligare Triclopyr 3 at 0.75 PPM a.e. to 50 acres:

$$\begin{aligned} \text{Setback in feet} &= \frac{[800 \times \text{In (50 acres)}] - 160}{3.33} \\ &= \frac{[800 \times 3.912] - 160}{3.33} \\ &= 892 \text{ feet} \end{aligned}$$

Alligare Triclopyr 3 can be applied around functioning potable water intakes or closer than these setback distances as long as the intake is turned off until the level of Triclopyr in the intake water is determined to be less than or equal to 0.4 parts per million (ppm) as determined by laboratory analysis or immunoassay.

STORAGE AND DISPOSAL

Do not contaminate water, food or feed by storage or disposal.

PESTICIDE STORAGE: Store above 28°F or agitate before use.

PESTICIDE DISPOSAL: Wastes resulting from the use of this product must be disposed of on site or at an approved waste disposal facility.

CONTAINER HANDLING:

Nonrefillable container. Do not reuse or refill this container. Offer for recycling, if available. Triple rinse container (or equivalent) promptly after emptying.

(Nonrefillable container ≤ 5 gallons): Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container ¼ full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times.

**LIMITED WARRANTY, TERMS OF SALE,
AND LIMITATION OF LIABILITY**

Upon purchase or use of this product, purchaser and user agree to the following terms:

Warranty: Alligare, LLC (the Company) warrants that this product conforms to the chemical description on the label in all material respects and is reasonably fit for the purpose referred to in the directions for use, subject to the exceptions noted below, which are beyond the Company's control. The Company makes no other representation or warranty, express or implied, concerning the product, including no implied warranty of merchantability or fitness for a particular purpose. No such warranty shall be implied by law, and no agent or representative is authorized to make any such warranty on the Company's behalf.

Terms of Sale: The Company's directions for use of this product must be followed carefully. It is impossible to eliminate all risks inherently associated with use of this product. Crop injury, ineffectiveness or other unintended consequences may result because of such factors as weather conditions, presence of other materials, and the manner of use or application (including failure to adhere to label directions), all of which are beyond the Company's control. To the extent consistent with applicable law, all such risks are assumed by the user.

Limitation of Liability: To the extent consistent with applicable law, the exclusive remedy against the Company for any cause of action relating to the handling or use of this product is a claim for damages, and in no event shall damages or any other recovery of any kind exceed the price of the product which caused the alleged loss, damage, injury or other claim. To the extent consistent with applicable law, under no circumstances shall the Company be liable for any special, indirect, incidental or consequential damages of any kind, including loss of profits or income, and any such claims are hereby waived. Some states do not allow the exclusion or limitation of incidental or consequential damages.

The Company and the seller offer this product, and the purchaser and user accept this product, subject to the foregoing warranty, terms of sale and limitation of liability, which may be varied or modified only by an agreement in writing signed on behalf of the Company by an authorized representative.

EPA 20210806

**GROUP 4 HERBICIDE**

TRICLOPYR 3

PEEL BACK BOOK HERE

ACTIVE INGREDIENT:Triclopyr: 3,5,6-trichloro-2-pyridinyloxyacetic acid,
triethylamine salt* 44.4%**OTHER INGREDIENTS:** 55.6%**TOTAL:** 100.0%

*Contains 3 pounds of Triclopyr acid equivalent per gallon (31.8%)

EPA Reg. No. 81927-13

EPA Est. No. 42750-MO-001^{ALB}
81927-AL-001^{PM}; 75640-COL-001^{PC}
7401-TX-001^{TX}; 51896-MS-19^{NT}

Letter(s) in lot number correspond(s) to superscript in EPA Est. No.

KEEP OUT OF REACH OF CHILDREN DANGER / PELIGRO

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand the label, find someone to explain it to you in detail).

PRECAUTIONARY STATEMENTS HAZARDS TO HUMANS AND DOMESTIC ANIMALS DANGER

Corrosive. Causes irreversible eye damage. Harmful if absorbed through skin or swallowed. Do not get in eyes, on skin, or on clothing. Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco, or using the toilet. Remove and wash contaminated clothing before reuse.

ENVIRONMENTAL HAZARDS

For terrestrial uses, do not apply directly to water, to areas where surface water is present, or to intertidal areas below the mean high water mark. Do not contaminate water when cleaning equipment or disposing of equipment washwaters.

For aquatic uses, under certain conditions, treatment of aquatic weeds can result in oxygen depletion or loss due to decomposition of dead plants, which may contribute to fish suffocation. This loss can cause fish suffocation. Therefore, to minimize this hazard, do not treat more than one-third to one-half of the water area in a single operation and wait at least 10 to 14 days between treatments. Begin treatment along the shore and proceed outwards in bands to allow fish to move into untreated areas. Consult with the State agency for fish and game before applying to public water to determine if a permit is needed.

This chemical has properties and characteristics associated with chemicals detected in groundwater. The use of this chemical in areas where soils are permeable, particularly where the water table is shallow, may result in groundwater contamination.

Manufactured for:
Alligare, LLC
1565 5th Avenue
Opelika, AL 36801

Net Contents: 2.5 Gallons (9.46 liters)**FIRST AID**

If in eyes	• Hold eye open and rinse slowly and gently with water for 15-20 minutes. • Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. • Call a poison control center or doctor for treatment advice.
If on skin or clothing	• Take off contaminated clothing. • Rinse skin immediately with plenty of water for 15-20 minutes. • Call a poison control center or doctor for treatment advice.
If swallowed	• Call a poison control center or doctor immediately for treatment advice. • Have person sip a glass of water if able to swallow. • Do not induce vomiting unless told to do so by a poison control center or doctor. • Do not give anything by mouth to an unconscious person.

HOT LINE NUMBER

Have the product container or label with you when calling a poison control center or doctor, or going for treatment. You may also contact 1-800-424-9300 for emergency medical treatment information.

NOTE TO APPLICATOR: Allergic skin reaction is not expected from exposure to spray solutions of Alligare Triclopyr 3 herbicide when used as directed.

NOTE TO PHYSICIAN: Probable mucosal damage may contraindicate the use of gastric lavage.

STORAGE AND DISPOSAL

Do not contaminate water, food or feed by storage or disposal.

PESTICIDE STORAGE: Store above 28°F or agitate before use.

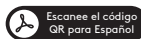
PESTICIDE DISPOSAL: Wastes resulting from the use of this product must be disposed of on site or at an approved waste disposal facility.

CONTAINER HANDLING:

Nonrefillable container. Do not reuse or refill this container. Offer for recycling, if available. Triple rinse container (or equivalent) promptly after emptying.

(Nonrefillable container ≤ 5 gallons): Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container ¼ full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times.

See label booklet for additional Precautionary Statements and Directions for Use.



EPA 20210806

TRICLOPYR GROUP 4 HERBICIDE



TRYCERA®

For the control of woody plants and broadleaf weeds in ornamental turf (including sod farms, commercial turf and golf courses), forests, Christmas tree plantations and industrial non-crop areas, including manufacturing and storage sites.

For use in rights-of-way such as electrical power lines, communication lines, pipelines, roadsides, railroads, fence rows, non-irrigation ditch banks, and around farm buildings; including application to grazed areas, and establishment and maintenance of wildlife openings on these sites.

Use within production forests and industrial non-crop sites (including those listed above) may include applications to control target vegetation around standing water sites, such as marshes, wetlands, and the banks of ponds and lakes.

Aquatic Sites: For control of emerged, submersed and floating aquatic plants in aquatic sites such as ponds, lakes, reservoirs, non-irrigation canals, seasonal irrigation waters and ditches which have little or no continuous outflow, marshes and wetlands, including broadleaf and woody vegetation on banks and shores within or adjacent to these and other aquatic sites.

ACTIVE INGREDIENT:

Triclopyr: 3,5,6-trichloro-2-pyridinyloxyacetic acid . . . 29.4%

OTHER INGREDIENTS 70.6%

TOTAL 100.0%

Triclopyr Acid equivalent: 2.87 lbs./gal.

KEEP OUT OF REACH OF CHILDREN DANGER / PELIGRO

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand the label, find someone to explain it to you in detail.)

First Aid

IF IN EYES:	Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for treatment advice.
IF ON SKIN OR CLOTHING:	Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice.
IF SWALLOWED:	Call a poison control center or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by a poison control center or doctor. Do not give anything by mouth to an unconscious person.

Have the product container or label with you when calling a poison control center or doctor, or going for treatment. You may also contact 1-800-824-9300 for emergency medical treatment information.

Note to Applicator: Allergic skin reaction is not expected from exposure to spray mixtures of **TRYCERA** herbicide when used as directed.

Note to Physician: Probable mucosal damage may contraindicate the use of gastric lavage.

SEE INSIDE PANEL FOR ADDITIONAL PRECAUTIONARY STATEMENTS

EPA Reg. No. 5905-580

EPA Est. No.: First letters of product batch code indicate producing establishment.

5905-AR-1=WA • 5905-GA-1=CG • 5905-IA-1=DI • 5905-CA-1=KC

AD 050420HAE



Herbicide

Manufactured For
HELENA AGRI-ENTERPRISES, LLC
225 SCHILLING BOULEVARD, SUITE 300
COLLIERVILLE, TENNESSEE 38017 U.S.A. • (901) 761-0050

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PRECAUTIONARY STATEMENTS

Hazards to Humans and Domestic Animals

DANGER. Corrosive. Causes irreversible eye damage. Harmful if swallowed or absorbed through skin. Prolonged or frequently repeated skin contact may cause allergic reaction in some individuals. Do not get in eyes or on skin or clothing. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco, or using the toilet. Remove and wash contaminated clothing before reuse.

Personal Protective Equipment (PPE)

Applicators and other handlers must wear:

- Long-sleeved shirt and long pants
- Shoes plus socks
- Protective eyewear
- Chemical-resistant gloves made of barrier laminate, nitrile rubber ≥ 14 mils, butyl rubber ≥ 14 mils, or Viton ≥ 14 mils

Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. Do not reuse them. Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables exist, use detergent and hot water. Keep and wash PPE separately from other laundry.

Engineering Controls

When handlers use closed systems, enclosed cabs, or aircraft in a manner that meets the requirements listed in the WPS (40 CFR 170.607), the handler PPE requirements may be reduced or modified as specified in the WPS.

User Safety Recommendations

Users should:

- Remove clothing/PPE immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
- Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

Environmental Hazards

Do not contaminate water when cleaning equipment or disposing of equipment washwaters. Under certain conditions, treatment of aquatic weeds can result in oxygen depletion or loss due to decomposition of dead plants, which may contribute to fish suffocation. This loss can cause fish suffocation. Therefore, to minimize this hazard, do not treat more than one-third to one-half of the water area in a single operation and wait at least 10 to 14 days between treatments. Begin treatment along the shore and proceed outwards in bands to allow fish to move into untreated areas. Consult with the State agency for fish and game before applying to public water to determine if a permit is needed.

This chemical has properties and characteristics associated with chemicals detected in groundwater. The use of this chemical in areas where soils are permeable, particularly where the water table is shallow, may result in groundwater contamination.

Physical or Chemical Hazards

Combustible. Do not use or store the product near heat or open flame.

Directions for Use

It is a violation of Federal law to use this product in a manner inconsistent with its labeling. Read all Directions for Use carefully before applying.

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your state or tribe, consult the agency responsible for pesticide regulation.

Agricultural Use Requirements

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR Part 170. This Standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE), and restricted-entry interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

Do not enter or allow worker entry into treated areas during the restricted-entry interval (REI) of 48 hours.

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water, is:

- Coveralls
- Shoes plus socks
- Protective eyewear
- Chemical-resistant gloves made of barrier laminate, nitrile rubber ≥ 14 mils, butyl rubber ≥ 14 mils, or Viton ≥ 14 mils

Non-Agricultural Use Requirements

The requirements in this box apply to uses of this product that are NOT within the scope of the Worker Protection Standard for Agricultural Pesticides (40 CFR Part 170). The WPS applies when this product is used to produce agricultural plants on farms, forests, nurseries, or greenhouses.

Entry Restrictions for Non-WPS Uses: Do not allow entry into areas until sprays have dried, unless applicator and other handler PPE is worn.

Resistance Management Recommendations

For resistance management, **TRYCERA** is a Group 4 herbicide. Any weed population may contain or develop plants naturally resistant to **TRYCERA** and other Group 4 herbicides. The resistant biotypes may dominate the weed population if these herbicides are used repeatedly in the same field. Appropriate resistance management strategies should be followed.

To delay herbicide resistance take one or more of the following steps:

- Rotate the use of **TRYCERA** or other Group 4 herbicides within a growing season sequence or among growing seasons with different herbicide groups that control the same weeds in a field.
- Use tank mixtures with herbicides from a different group if such use is permitted; where information on resistance in target weed species is available, use the less resistance-prone partner at a rate that will control the target weed(s) equally as well as the more resistance-prone partner. Consult your local extension service or certified crop advisor if you are unsure as to which active ingredient is currently less prone to resistance.
- Adopt an integrated weed-management program for herbicide use that includes scouting and uses historical information related to herbicide use and crop rotation, and that considers tillage (or other mechanical control methods), cultural (e.g., higher crop seeding rates; precision fertilizer application method and timing to favor the crop and not the weeds), biological (weed-competitive crops or varieties) and other management practices.
- Scout after herbicide application to monitor weed populations for early signs of resistance development. Indicators of possible herbicide resistance include:
 - (1) failure to control a weed species normally controlled by the herbicide at the dose applied, especially if control is achieved on adjacent weeds;
 - (2) a spreading patch of non-controlled plants of a particular weed species;
 - (3) surviving plants mixed with controlled individuals of the same species. If resistance is suspected, prevent weed seed production in the affected area by an alternative herbicide from a different group or by a mechanical method such as hoeing or tillage. Prevent movement of resistant weed seeds to other fields by cleaning harvesting and tillage equipment when moving between fields, and planting clean seed.

- If a weed pest population continues to progress after treatment with this product, discontinue use of this product, and switch to another management strategy or herbicide with a different mode of action, if available.
- Contact your local extension specialist or certified crop advisors for additional pesticide resistance-management and/or integrated weed-management recommendations for specific crops and weed biotypes.
- For further information or to report suspected resistance, contact Helena Agri-Enterprises, LLC company representatives at 901-761-0050 or at our website at HelenaAgri.com.

ORNAMENTAL TURF

(INCLUDING SOD FARMS, COMMERCIAL TURF, AND GOLF COURSES)

FOR USE ON PERENNIAL BLUEGRASS, PERENNIAL RYEGRASS, AND TALL FESCUE

For spot treatments, do not apply more than 2.8 qts. of **TRYCERA**® per acre in a single application.

Foliar sprays should be applied during warm weather, from early spring through fall, when weeds are actively growing. Broadleaf weeds germinate at different times. Only emerged weeds present at the time of application will be controlled. Newly seeded turf should be mowed 2 or 3 times before being treated. When making applications to mature plants, hard-to-control species, or during drought conditions, use higher rates. Application under drought conditions may provide less than desirable results. Use low pressure sprays to minimize spray drift. Do not water for 24 hours after application.

Mixing Instructions

When **TRYCERA**® is mixed with water it forms an emulsion (not a solution) and separation may occur unless the spray mixture is agitated continuously.

Add about one-half the required amount of clean water to the spray tank. Start agitation and add the specified amount of **TRYCERA**®. Provide moderate agitation while completing the addition of water and during application.

Reseeding Precaution: Do not reseed for 3 weeks after application. (This precaution does not apply when bermudagrass turf is overseeded with perennial ryegrass at a minimum reseeding of 400 lbs. per acre.)

Broadcast Treatment of Ornamental Turf

Apply 0.7 to 1.4 quarts per acre of **TRYCERA**® in enough water to provide uniform coverage of the target area to control actively growing broadleaf weeds growing in perennial bluegrass, perennial ryegrass, or tall fescue. Do not use on other turf grass species (see RESTRICTIONS section of this label) unless injury can be tolerated. To minimize turf injury, do not treat if turf is under heat-or drought-stress and make repeat applications at least 4 weeks apart.

Tank Mixing: To improve the spectrum of activity, **TRYCERA**® may be tank mixed at a rate of 0.7 to 1.4 pints per acre with specified rates of low-volatile amine or ester formulations of 2,4-D, MCPP, or other labeled postemergence broadleaf herbicides. Refer to tank mix product labels for specific use directions, precautions, and limitations before use.

Spot Treatment of Ornamental Turf

Mix ½ to 1 ounce of **TRYCERA**® per 1000 square feet in enough water to provide uniform coverage of the target area and apply at any time broadleaf weeds are susceptible. **Note:** Do not apply more than 2.8 quarts per acre or 2 ounces per 1000 square feet of **TRYCERA**® in a single application.

Control of Kikuyugrass

Apply **TRYCERA**® at a rate of 0.7 to 1.4 quarts per acre. Three to four additional applications at 4 to 6 week intervals may be required to achieve control of kikuyugrass.

Suppression of Bermudagrass

Apply **TRYCERA**® at the rate of 1.4 quarts per acre. Three to four additional applications at 4 week intervals will be required to give adequate suppression of bermudagrass and allow fescue or other desired turfgrass species to dominate. To improve suppression and control of bermudagrass, 1.4 quarts per acre of **TRYCERA**® may be tank mixed with a postemergence grass herbicide registered for this use pattern. Three to four additional applications of this tank mix at 4 week intervals should be made to achieve control. Reseeding following application will accelerate the transition to cool season turf (see Reseeding Precautions above).

WOODY PLANTS CONTROLLED			ANNUAL AND PERENNIAL BROADLEAF WEEDS CONTROLLED
alder	dogwood	salmonberry	bindweed
arrowwood	elderberry	sassafras	burdock
ash	elm	scotch broom	Canada thistle
aspen	gallberry	sumac	chicory
Australian pine	hazel	sweetbay magnolia	curly dock
bear clover (bearmat)	hornbeam	sweetgum	dandelion
beech	kudzu	sycamore	elephant ear
birch	locust	tanoak	field bindweed
blackberry	madrone	thimbleberry	lambquarters
blackgum	Melaleuca (seedlings)	tulip poplar	Mexican petunia
Brazilian pepper	maples	waxmyrtle	plantain
cascara	mulberry	western hemlock	purple loosestrife*
ceanothus	oaks	white titi	ragweed
cherry	persimmon	wild rose	smartweed
Chinese tallow	pine	willow	spanishneedles/common beggarticks
chinquapin	poison ivy	winged elm	tansy ragwort
choke cherry	poison oak		tropical soda apple
cottonwood	poplar		vetch
Crataegus (hawthorn)	Salt-brush (<i>Baccharis</i> spp.)		wedelia
Douglas fir	salt cedar		wild lettuce

USE RESTRICTIONS FOR ORNAMENTAL TURF

- **TRYCERA®** may injure certain turfgrass species. Do not apply to bahiagrass, bentgrass, bermudagrass, centipedegrass, St. Augustine grass, or zoysiagrass, unless turf injury can be tolerated.
- Do not apply **TRYCERA®** to exposed roots of shallow rooted trees and shrubs.
- Do not apply **TRYCERA®** to golf course greens.
- Do not allow grazing in treated areas.
- Do not apply this product through any type of irrigation system.

PRODUCT INFORMATION FOR PRODUCTION FORESTS AND INDUSTRIAL NON-CROP AREAS

Use **TRYCERA®** specialty herbicide for the control of woody plants and broadleaf weeds in forests and industrial non-crop areas including manufacturing and storage sites, rights-of-way such as electrical power lines, communication lines, pipelines, roadsides, railroads, fence rows, non-irrigation ditch banks.

Use around farm buildings, including application to grazed areas, and establishment and maintenance of wildlife openings on these sites, and in Christmas tree plantations.

Use within production forests and industrial non-crop sites (including those listed above) include applications to control target vegetation in and around standing water sites, including marshes, wetlands, and the banks of ponds and lakes.

Obtain Required Permits: Consult with appropriate state or local water authorities before applying this product to public waters. State or local public agencies may require permits.

It is permissible to treat non-irrigation ditch banks, seasonally dry wetlands (such as flood plains, deltas, marshes, swamps, or bogs) and transitional areas between upland and lowland sites where surface water is not present except in isolated pockets due to uneven or unlevel conditions.

USE RESTRICTIONS

In Arizona: The state of Arizona has not approved **TRYCERA®** for use on plants grown for commercial production, specifically forests grown for commercial timber production, or on designated grazing areas.

Chemigation: Do not apply this product through any type of irrigation system.

Do not apply **TRYCERA®** directly to, or allow direct contact with grapes, tobacco, vegetable crops, flowers, or other desirable broadleaf plants. Do not permit spray mists containing **TRYCERA®** to drift onto such plants.

Do not apply on ditches or canals currently being used to transport irrigation water or that will be used for irrigation within 120 days following treatment. It is permissible to treat irrigation and non-irrigation ditch banks.

Do not use treated water for irrigation purposes for 120 days after application or until residue levels of **TRYCERA®** are determined by laboratory analysis, or other appropriate means of analysis to be 1 ppb or less.

Seasonal Irrigation Waters: **TRYCERA®** may be applied during the off-season to surface waters that are used for irrigation on a seasonable basis provided that there is a minimum of 120 days between applying **TRYCERA®** and the first use of treated water for irrigation purposes, or until residue levels of **TRYCERA®** are determined by laboratory analysis, or other appropriate means of analysis, to be 1 ppb or less.

Irrigation Canals/Ditches: Do not apply **TRYCERA®** to irrigation canals/ditches unless the 120-day restriction on irrigation water usage can be observed or residue levels of **TRYCERA®** are determined by laboratory analysis, or other appropriate means of analysis, to be 1 ppb or less.

Do not apply to salt water bays or estuaries.

Do not apply to bodies of water with a continuous outflow.

Do not apply directly to un-impounded rivers or streams.

Do not apply where runoff water may flow onto agricultural land as injury to crops may result.

When making applications to control unwanted plants on banks or shorelines of moving water sites, minimize overspray to open water.

Do not apply using a mistblower.

On rights-of-way, fence rows, or any area where grazing and haying is allowed, do not apply more than a total of 2 lb ae of triclopyr (2.8 quarts of **TRYCERA®**) per acre per year.

On forestry sites, do not apply more than a total of 6 lb ae of triclopyr (8.4 quarts of **TRYCERA®**) per acre per year.

For all other terrestrial use sites other than grazing/haying areas and forestry sites, do not apply more than a total of 9 lb ae of triclopyr (12.6 quarts of **TRYCERA®**) per acre per year.

For emerged aquatic weeds, do not exceed a total of 6 lb ae of triclopyr (8.4 quarts of **TRYCERA®**) per acre per annual growing season.

Use Restrictions for Grazing and Haying

Grazing green forage:

There are no grazing restrictions for livestock or dairy animals on treated areas.

Haying (harvesting of dried forage):

Do not harvest hay for 14 days after application.

Grazed areas of non-cropland and forestry sites may be spot treated if they comprise no more than 10% of the total grazable area.

Slaughter Restrictions: During the season of application, withdraw livestock from grazing treated grass at least 3 days before slaughter.

Avoiding Injurious Spray Drift

Make applications only when there is little or no hazard from spray drift. Small quantities of spray, which may not be visible, may seriously injure susceptible plants. Do not spray when wind is blowing toward susceptible crops or ornamental plants that are near enough to be injured. It is suggested that a continuous smoke column at or near the spray site or a smoke generator on the spray equipment be used to detect air movement, lapse conditions, or temperature inversions (stable air). If the smoke layers or indicates a potential of hazardous spray drift, do not spray.

AERIAL APPLICATION INSTRUCTIONS

For aerial application on rights-of-way or other areas near susceptible crops, apply through a Microfoil or Thru-Valve boom*, or use an agriculturally labeled drift control additive. Other drift reducing systems or thickened sprays prepared by using high viscosity inverting systems may be used if they are made as drift-free as mixtures containing agriculturally labeled thickening agents or applications made with the Microfoil or Thru-Valve boom. Keep spray pressures low enough to provide coarse spray droplets. Use spray boom no longer than 3/4 of the rotor length. Do not use a thickening agent with the Microfoil or Thru-Valve booms, or other systems that cannot accommodate thick sprays. Spray only when the wind velocity is low (follow state regulations). Avoid application during air inversions. If a spray thickening agent is used, follow all use recommendations and precautions on the product label.

*Reference within this label to a particular piece of equipment produced by or available from other parties is provided without consideration for use by the reader at its discretion and subject to the reader's independent circumstances, evaluation, and expertise. Such reference by Helena Agri-Enterprises, LLC is not intended as an endorsement of such equipment, shall not constitute a warranty (express or implied) of such equipment, and is not intended to imply that other equipment is not available and equally suitable. Any discussion of methods of use of such equipment does not imply that the reader should use the equipment other than is advised in directions available from the equipment's manufacturer. The reader is responsible for exercising its own judgment and expertise, or consulting with sources other than Helena Agri-Enterprises, LLC, in selecting and determining how to use its equipment.

Spray Drift Management

Avoiding spray drift at the application site is the responsibility of the applicator. The interaction of many equipment and weather related factors determine the potential for spray drift. The applicator and the grower are responsible for considering all these factors when making decisions.

The following drift management requirements must be followed to avoid off-target drift movement from aerial applications:

1. The distance of the outermost operating nozzles on the boom must not exceed 3/4 the length of the rotor.
2. Nozzles must always point backward parallel with the airstream and never be pointed downwards more than 45 degrees.

Where states have more stringent regulations, they must be observed.

The applicator must be familiar with and take into account the information covered in the following Aerial Drift Reduction Advisory. [This information is advisory in nature and does not supersede mandatory label requirements.]

Aerial Drift Reduction Advisory

Information on Droplet Size: The most effective way to reduce drift potential is to apply large droplets. The best drift management strategy is to apply the largest droplets that provide sufficient coverage and control. Applying larger droplets reduces drift potential, but will not prevent drift if applications are made improperly, or under unfavorable environmental conditions (see Wind, Temperature and Humidity, and Temperature Inversions).

Controlling Droplet Size:

- **Volume** - Use high flow rate nozzles to apply the highest practical spray volume. Nozzles with higher rated flows produce larger droplets.
- **Pressure** - Do not exceed the nozzle manufacturer's recommended pressures. For many nozzle types, lower pressure produces larger droplets. When higher flow rates are needed, use higher flow rate nozzles instead of increasing pressure.

- **Number of Nozzles** - Use the minimum number of nozzles that provide uniform coverage.
- **Nozzle Orientation** - Orienting nozzles so that the spray is released parallel to the airstream produces larger droplets than other orientations and is the recommended practice. Significant deflection from horizontal will reduce droplet size and increase drift potential.
- **Nozzle Type** - Use a nozzle type that is designed for the intended application. With most nozzle types, narrower spray angles produce larger droplets. Consider using low-drift nozzles. Solid stream nozzles oriented straight back produce the largest droplets and the lowest drift.

Boom Length: For some use patterns, reducing the effective boom length to less than 3/4 of the wingspan or rotor length may further reduce drift without reducing swath width.

Application Height: Applications must not be made at a height greater than 10 feet above the top of the largest plants unless a greater height is required for aircraft safety. Making applications at the lowest height that is safe reduces exposure of droplets to evaporation and wind.

Swath Adjustment: When applications are made with a crosswind, the swath will be displaced downwind. Therefore, on the up and downwind edges of the field, the applicator must compensate for this displacement by adjusting the path of the aircraft upwind. Increase swath adjustment distance with increasing drift potential (higher wind, smaller drops, etc.).

Wind: Drift potential is lowest between wind speeds of 2 to 10 mph. However, many factors, including droplet size and equipment type, determine drift potential at any given speed. Application must be avoided below 2 mph due to variable wind direction and high inversion potential. **Note:** Local terrain can influence wind patterns. Every applicator should be familiar with local wind patterns and how they affect spray drift.

Temperature and Humidity: When making applications in low relative humidity, set up equipment to produce larger droplets to compensate for evaporation. Droplet evaporation is most severe when conditions are both hot and dry.

Temperature Inversions: Applications must not occur during a local, low level temperature inversion because drift potential is high. Temperature inversions restrict vertical air mixing, which causes small suspended droplets to remain in a concentrated cloud. This cloud can move in unpredictable directions due to the light variable winds common during inversions. Temperature inversions are characterized by increasing temperatures with altitude and are common on nights with limited cloud cover and light to no wind. They begin to form as the sun sets and often continue into the morning. Their presence can be indicated by ground fog; however, if fog is not present, inversions can also be identified by the movement of the smoke from a ground source or an aircraft smoke generator. Smoke that layers and moves laterally in a concentrated cloud (under low wind conditions) indicates an inversion, while smoke that moves upward and rapidly dissipates indicates good vertical air mixing.

Sensitive Areas: The pesticide must only be applied when the potential for drift to adjacent sensitive areas (e.g., residential areas, bodies of water, known habitat for threatened or endangered species, non-target crops) is minimal (e.g., when wind is blowing away from the sensitive areas).

Ground Equipment: To aid in reducing spray drift, **TRYCERA®** should be used in thickened (high viscosity) spray mixtures using an agriculturally labeled drift control additive, high viscosity invert system, or equivalent as directed by the manufacturer. With ground equipment, spray drift can be reduced by keeping the spray boom as low as possible; by applying 20 gallons or more of spray per acre; by keeping the operating spray pressures at the lower end of the manufacturer's recommended pressures for the specific nozzle type used (low pressure nozzles are available from spray equipment manufacturers); and by spraying when wind velocity is low (follow state regulations). In hand-gun applications, select the minimum spray pressure that will provide adequate plant coverage (without forming a mist). Do not apply with nozzles that produce a fine-droplet spray.

High Volume Leaf-Stem Treatment: To minimize spray drift, do not use pressure exceeding 50 psi at the spray nozzle and keep sprays no higher than brush tops. An agriculturally labeled thickening agent may be used to reduce drift.

WOODY PLANTS CONTROLLED

alder	Douglas fir	salt-brush (<i>Baccharis</i> spp.)
arrowwood	dogwood	salt cedar**
ash	elderberry	salmonberry
aspen	elm	sassafras
Australian pine	gallberry	scotch broom
bear clover (bearmat)	hazel	sumac
beech	hornbeam	sweetbay magnolia
birch	kudzu	sweetgum
blackberry	locust	sycamore
blackgum	madrone	tanoak
Brazilian pepper	Melaleuca (seedlings)	thimbleberry
cascara	maples	tulip poplar
ceanothus	mulberry	waxmyrtle
cherry	oaks	western hemlock
Chinese tallow	persimmon	white titi
chinquapin	pine	wild rose
choke cherry	poison ivy	willow
cottonwood	poison oak	winged elm
crataegus (hawthorn)	poplar	yaupon

ANNUAL AND PERENNIAL BROADLEAF WEEDS CONTROLLED

bindweed	field bindweed	smartweed
burdock	lambquarters	spanishneedles/common beggarticks
Canada thistle	Mexican petunia	tansy ragwort
chicory	plantain	tropical soda apple
curly dock	purple loosestrife ⁽¹⁾	vetch
dandelion	ragweed	wedelia
elephant ear	sericea lespedeza ⁽²⁾	wild lettuce

*For complete control, re-treatment may be necessary.

**Use cut surface treatments for best results.

⁽¹⁾ **Purple Loosestrife (*Lythrum salicaria*)**

Purple loosestrife can be controlled with foliar applications of **TRYCERA®**. For broadcast applications, use a minimum of 6.4 to 8.4 quarts of **TRYCERA®** (4.5 to 6 lbs. ae of triclopyr) per acre. Apply **TRYCERA®** when purple loosestrife is at the bud to mid-flowering stage of growth. Follow-up applications for control of re-growth should be made the following year in order to achieve increased control of this weed species. For all applications, a non-ionic surfactant should be added to the spray mixture. Follow all directions and use precautions on the label of the surfactant. Thorough wetting of the foliage and stems is necessary to achieve satisfactory control. A minimum spray volume of 50 gallons per acre is recommended for ground broadcast applications.

If using a backpack sprayer, use a spray mixture containing 1% to 1.5% **TRYCERA®** or 5.1 to 7.7 fl oz of **TRYCERA®** per 4 gallons of water. Thoroughly wet all purple loosestrife plants.

⁽²⁾ **Sericea Lespedeza**

Apply 1.4 to 2.8 pints of **TRYCERA®** (0.5 to 1.0 lb. ae of triclopyr) per acre. For best results, apply after maximum foliage development in the late spring to early summer, but prior to bloom.

APPLICATION METHODS

Use **TRYCERA**® specialty herbicide at rates of 2.1 pints to 12.6 quarts of **TRYCERA**® (3/4 to 9 lbs. ae of triclopyr) per acre to control broadleaf weeds and woody plants. In all cases, use the amount specified in enough water to give uniform and complete coverage of the plants to be controlled. Use only water suitable for spraying. Use an agriculturally labeled non-ionic surfactant for all foliar applications. When using surfactants, follow the use directions and precautions listed on the surfactant manufacturer's label. Use the higher concentrations of surfactant in the spray mixture when applying lower spray volumes per acre. The order of addition to the spray tank is water, spray thickening agent (if used), additional herbicide (if used), and **TRYCERA**®. Add surfactant to the spray tank last or as recommended on the product label. It combined with emulsifiable concentrate herbicides, moderate continuous adequate agitation is required.

It is the pesticide user's responsibility to ensure that all products in the listed mixtures are registered for the intended use(s). Read and follow the applicable restrictions and limitations and directions for use on all product labels involved in tank mixing. Users must follow the most restrictive directions for use and precautionary statements of each product in the tank mixture.

For best results, apply when woody plants and weeds are actively growing. When hard to control species such as ash, blackgum, choke cherry, elm, maples, oaks, pines, or winged elm are prevalent and during applications made in late summer when the plants are mature and during drought conditions, use the higher rates of **TRYCERA**® alone or in combination with a picloram and 2,4-D acid product.

When using **TRYCERA**® in combination with a 2,4-D amine or low volatile ester herbicides generally the higher rates should be used for satisfactory brush control.

Use the higher dosage rates when brush approaches an average of 15 feet in height or when the brush covers more than 60% of the area to be treated. If lower rates are used on hard to control species, re-sprouting may occur the year following treatment.

On sites where easy to control brush species dominate, rates less than those listed may be effective. Consult State or Local Extension personnel for such information.

FOLIAGE TREATMENT WITH GROUND EQUIPMENT

High Volume Foliage Treatment

For control of woody plants, use **TRYCERA**® at the rate of 4.2 to 12.6 quarts **TRYCERA**® (3 to 9 lb ae of triclopyr) per 100 gallons of spray solution, or 1 to 4.2 quarts of **TRYCERA**® (3/4 to 3 lb ae of triclopyr) may be tank mixed with a 2,4-D amine or low volatile ester, or a picloram and 2,4-D acid product and diluted to make 100 gallons of spray solution. Apply at a volume of 100 to 400 gallons of total spray per acre depending upon size and density of woody plants. Coverage should be thorough to wet all leaves, stems, and root collars. (See Use Restrictions) Do not exceed maximum allowable use rates per acre (see table below).

Maximum Labeled Rate versus Spray Volume per Acre

Total Spray Volume (gal./acre)	Maximum Rate of TRYCERA ®		
	Grazed/Hayed Non-Cropland* (gal/100 gal of spray)	Forestry Sites** (gal/100 gal of spray)	Other Non-Cropland Sites*** (gal/100 gal of spray)
400	Do not use	0.5	0.75
300	Do not use	0.67	1
200	Do not use	1	1.5
100	0.67	2	3
50	1.33	4	6
40	1.67	5	7.5

*Do not exceed the maximum use rate of 2.8 quarts of **TRYCERA**® (2 lb ae of triclopyr)/acre/year.

Do not exceed the maximum use rate of 8.4 quarts of **TRYCERA® (6 lb ae of triclopyr)/acre/year.

***Do not exceed the maximum use rate of 12.6 quarts of **TRYCERA**® (9 lb ae of triclopyr)/acre/year on non-crop Land use sites other than forestry sites and grazed/hayed areas. *(continued)*

Maximum Labeled Rate versus Spray Volume per Acre (cont.)

Total Spray Volume (gal./acre)	Maximum Rate of TRYCERA®		
	Grazed/Hayed Non-Cropland* (gal/100 gal of spray)	Forestry Sites** (gal/100 gal of spray)	Other Non-Cropland Sites*** (gal/100 gal of spray)
30	2.33	6.65	10
20	3.33	10	15
10	6.67	20	30

*Do not exceed the maximum use rate of 2.8 quarts of **TRYCERA®** (2 lb ae of triclopyr)/acre/year.

Do not exceed the maximum use rate of 8.4 quarts of **TRYCERA® (6 lb ae of triclopyr)/acre/year.

***Do not exceed the maximum use rate of 12.6 quarts of **TRYCERA®** (9 lb ae of triclopyr)/acre/year on non-crop Land use sites other than forestry sites and grazed/hayed areas.

LOW VOLUME FOLIAGE TREATMENT

To control susceptible woody plants, up to 12.6 quarts of **TRYCERA®** (9 lb ae of triclopyr) in 10 to 100 gallons of finished spray. The spray concentration of **TRYCERA®** and total spray volume per acre should be adjusted according to the size and density of target woody plants and kind of spray equipment used. With low volume sprays, use sufficient spray volume to obtain uniform coverage of target plants including the surfaces of all foliage, stems, and root collars (see Use Restrictions). For best results, a surfactant should be added to all spray mixtures. Match equipment and delivery rate of spray nozzles to height and density of woody plants. When treating tall, dense brush, a truck mounted spray gun with spray tips that deliver up to 2 gallons per minute at 40 to 60 psi may be required. Backpack or other types of specialized spray equipment with spray tips that deliver less than 1 gallon of spray per minute may be appropriate for short, low to moderate density brush.

Tank Mixing: As a low volume foliar spray, up to 12.6 quarts of **TRYCERA®** (9 lb ae of triclopyr) may be applied in tank mix combination with a picloram and 2,4-D acid product in 10 to 100 gallons of finished spray.

BROADCAST APPLICATIONS WITH GROUND EQUIPMENT

Apply using equipment that will assure uniform coverage of the spray volumes applied. To improve spray coverage, add an agriculturally labeled non-ionic surfactant. See Maximum Labeled Rate versus Spray Volume per Acre table above for relationship between mixing rate, spray volume and maximum application rate.

Woody Plant Control

Foliage Treatment: Use 8.4 to 12.6 quarts of **TRYCERA®** (6 to 9 lb ae of triclopyr) in enough water to make 20 to 100 gallons of total spray per acre or 2.1 to 4.2 quarts of **TRYCERA®** (1.5 to 3 lb ae of triclopyr) may be combined with 2,4-D amine or low volatile esters or a picloram and 2,4-D acid product in sufficient water to make 20 to 100 gallons of total spray per acre.

Broadleaf Weed Control

Use **TRYCERA®** at rates of 1.4 to 6.4 quarts of **TRYCERA®** (1 to 4.5 lb ae of triclopyr) in a total volume of 20 to 100 gallons of water per acre. Apply any time during the growing season. **TRYCERA®** at 1.4 to 4.2 quarts (1 to 3 lb ae of triclopyr) may be tank mixed with a picloram and 2,4-D acid product or 2,4-D amine or low volatile herbicides to improve the spectrum of activity.

Aerial Application (Helicopter Only)

Use suitable drift control when applying aerial sprays (See Use Restrictions.) Add an agriculturally labeled non-ionic surfactant as described under Directions for Use. See Maximum Labeled Rate versus Spray Volume per Acre table above for relationship between mixing rate, spray volume and maximum application rate.

Foliage Treatment (Non-Grazed Rights-of-Way)

Non-grazed areas: Use 8.4 to 12.6 quarts **TRYCERA®** (6 to 9 lb ae of triclopyr) or 4.2 to 6.4 quarts of **TRYCERA®** (3 to 4.5 lb ae of triclopyr) in a tank mix combination with 2,4-D amine or low volatile esters or a picloram and 2,4-D acid product, and apply in a total spray volume of 10 to 30 gallons per acre. Use the higher rates and volumes when plants are dense or under drought conditions. Interspersed areas in non-grazed rights-of-ways that may be subject to grazing may be spot treated if the treated area comprises no more than 10% of the total grazable area.

Mesquite Control Using High Volume Foliage Treatment: For control of mesquite infestations of low to moderate density, apply **TRYCERA®** specialty herbicide and Reclaim® in a tank mixture to individual plants with backpack or hand-held sprayers or a vehicle-mounted sprayer with hand-held spray wand or spray gun. For individual plant treatment, use 2.6 quarts of **TRYCERA®** in combination with Reclaim® per 100 gallons of total spray solution (1/2% v/v). Apply in water or as an oil-water emulsion as described in Mixing Directions. If using an oil-water emulsion, add the oil at a rate of 5% of the total spray volume. Apply as a complete-spray-to-wet foliar application, including all leaves. Thorough coverage is necessary for good results, but do not spray to the point of runoff. Do not apply when mesquite foliage is wet. For best results, follow information given elsewhere in this label concerning effect of environmental conditions and application timing on control. This application method works best for brush less than 8 feet tall since efficient treatment and thorough coverage of taller brush is difficult to achieve with this method. To minimize drift, select a spray nozzle and pressure that provides good coverage while forming a coarse spray. Additionally, drift may be reduced by using the minimum pressure necessary to obtain plant coverage without forming a mist and by directing sprays no higher than the top of target plants. If desired, a spray dye may be added to the spray mixture to mark the treated plants.

Broadcast Application With Aerial or Ground Equipment

Environmental conditions and application timing influence brush and weed control results. For best results, apply when woody plants and weeds are actively growing: For woody species, apply after the rapid growth period of early spring when leaf tissue is fully expanded and terminal growth has slowed.

Brush re-growth should be at least 4 ft. high prior to treatment to insure adequate foliage for herbicide absorption. Adequate soil moisture before and after treatment, as well as, the presence of healthy foliage at the time of application are important factors contributing to optimal herbicidal activity.

Use sufficient spray volume to completely and uniformly cover foliage. For ground application, apply 10 gallons or more of total spray volume per acre. For aerial application, apply at least 2 gallons of total spray volume per acre. Use higher spray volumes for ground or aerial applications to ensure adequate coverage with increased depth and density of foliage, particularly for treatment of woody plants.

Mesquite: The herbicidal response of mesquite is strongly influenced by foliage condition, growth stage and environmental conditions. For best results, apply when new growth foliage has turned from light to dark green, when the soil temperature is above 75°F at a depth of 12 to 18 inches, and soil moisture is adequate for plant growth. Apply within 60 days after the 75°F minimum soil temperature at the 12- to 18- inch depth has been reached. Product performance may be adversely affected if application is made before mesquite foliage has turned from light to dark green or if foliage has been injured or removed by late frost, insects, hail or plant diseases. Do not treat if mesquite exhibits new (light green) terminal growth in response to recent heavy rainfall during the growing season. Rate of soil warm-up at the 12- to 18-inch depth may vary with soil texture and drainage. Coarse-textured (sandy) soils warm up sooner than fine-textured (clay) soils and dry soils warm up more quickly than wet soils. Mesquite re-growth should be at least 4 ft. high prior to treatment to insure adequate foliage for herbicide absorption.

Mesquite Only

Apply 12.5 to 25.5 ounces of **TRYCERA®** per acre in combination with Reclaim®. See label for Reclaim® for additional treatment directions and information on mesquite control. Apply aerially as an oil:water emulsion in 4 gallons or more total volume per acre or with ground equipment in 10 gallons or more total volume per acre. Use a maximum of 1 gallon of oil per acre for aerial or ground application.

Mesquite and Pricklypear Cactus

If prickly pear cactus is a target species in association with mesquite, apply a tank mix of 12.5 to 25.5 ounces of **TRYCERA®** with Tordon® 22K per acre. Tordon® 22K may also be applied in combination with Reclaim® to control prickly pear while providing improved control of mesquite. See labels for Tordon® 22K and Reclaim® for additional information and treatment directions. Apply aerially as an oil:water emulsion in 4 gallons or more total volume per acre or with ground equipment in 10 gallons or more total volume per acre. If mesquite canopy is dense, use higher spray volumes. Use a maximum of 1 gallon of oil per acre for aerial or ground application.

South Texas Mixed Brush (Mesquite, Pricklypear Cactus, Blackbrush, Twisted Acacia and Granjeno)

Use 12.5 to 25 ounces of **TRYCERA**® in a tank mix with picloram per acre if pricklypear is a problem or with clopyralid per acre if mesquite is the prevalent species. **TRYCERA**® contributes to the control of non-legume species such as granjeno and oaks. However, if woody legume species are predominate, apply picloram in combination with clopyralid per acre for improved control. See labels for picloram and clopyralid for additional information and treatment directions. Apply aerially in an oil:water emulsion in 4 gallons or more total volume per acre or with ground equipment in 15 gallons or more total volume per acre. Use a maximum of 1 gallon of oil per acre for aerial or ground application. The use of an oil:water emulsion is critical and good spray coverage is essential for acceptable brush control.

Sand Shinnery Oak Suppression

In Texas, New Mexico and Oklahoma, apply **TRYCERA**® alone at a rate of 12.5 to 25 ounces per acre for suppression of shinnery oak growing on sandy soils. Grass response following suppression may be impressive where rainfall is adequate. Grazing deferment following application together with proper grazing management is recommended to allow for the reestablishment of grass stands.

Post Oak and Blackjack Oak – Re-growth Stands

Apply in the late spring (May) to early summer (June-July) when oak leaves are fully developed (expanded). Use 2.6 quarts of **TRYCERA**® alone or in tank mix combination with 2,4-D low-volatile ester herbicide per acre. Apply in an oil:water emulsion or water surfactant dilution in sufficient total volume per acre to assure thorough coverage, usually 5 gallons or more per acre by fixed-wing aircraft or helicopter or 15 to 25 gallons per acre by ground equipment. Use a maximum of 1 gallon of oil per acre for aerial or ground application. Lower rates may be used for suppression only. Control will require at least 3 consecutive treatments.

Note: Re-growth plants have a large root mass relative to top growth when compared to undisturbed plants. In order for top growth to intercept and translocate enough herbicide to control the roots, delay broadcast treatment until top growth is at least 4 ft tall.

High Volume Foliage Treatment: For re-growth less than 4 ft tall, apply 2.6 quarts of **TRYCERA**® per 100 gallons of water and 2 quarts of surfactant alone or in tank mix combination with a picloram and 2,4-D acid product. Apply as a high volume leaf-stem treatment to individual plants using ground equipment.

Post Oak and Blackjack Oak – Mature Stands

For control of mature stands (greater than 5 ft tall), apply 2.6 quarts of **TRYCERA**® per acre in late spring (May) to early summer (June-July) when oak leaves are fully developed (expanded). Understory species such as winged elm, buckbrush, tree huckleberry and ash occurring in some areas will not be controlled (only suppressed or defoliated) by using **TRYCERA**® alone. Where these understory species occur, control may be improved by tank mixing 2.6 quarts of **TRYCERA**® per acre with a picloram and 2,4-D acid product per acre. For best results, apply as an oil:water emulsion in a total volume of 5 gallons per acre or more by fixed-wing aircraft or helicopter.

Other Susceptible Woody Plants

Apply 2.6 to 5.4 pints of **TRYCERA**® alone or in combination with 2,4-D low volatile ester or amine formulation per acre. If difficult to control species such as ash, choke cherry, elm, maple or oaks are prevalent, and during applications made when plants are mature late in the summer or during drought conditions, use the higher rates of **TRYCERA**®, alone or with 2,4-D. **TRYCERA**® may also be applied in a tank mixture with a picloram and 2,4-D acid product for increased control of certain species. See labels for a picloram and 2,4-D acid product for additional information and treatment direction. Apply aerially in 4 gallons or more total volume per acre or with ground equipment in 10 gallons or more total volume per acre. For best results on blackberry, apply during or after bloom. For management of kudzu, apply 1 quart of **TRYCERA**® per acre. Repeat application may be necessary to achieve desired level of control.

Susceptible Broadleaf Weeds

Use 2.6 pints of **TRYCERA**® per acre in a water spray. Apply as a broadcast spray in a total volume of 10 gallons or more per acre by ground equipment or aerially in a total volume of 2 gallons or more per acre. Apply anytime the weeds are actively growing. **TRYCERA**® at 1/2 to 4 pints may be tank mixed with 2,4-D amine or low volatile ester.

Forest Management Applications

For best control from broadcast applications of **TRYCERA**®, use a spray volume which will provide thorough plant coverage. Recommended spray volumes are usually 10 to 25 gallons per acre by air or 10 to 100 gallons per acre by ground. To improve spray coverage of spray volumes less than 50 gallons per acre, add an agriculturally labeled non-ionic surfactant as described under Directions for Use. Use application systems to prevent hazardous drift to off-target sites. Nozzles or additives that produce larger droplets of spray may require higher spray volumes to maintain brush control.

Forest Site Preparation (Not for Conifer Release)

Use up to 2 gallons of **TRYCERA**® and apply in a total spray volume of 10 to 30 gallons per acre or **TRYCERA**® at 4.2 to 6.4 quarts (3 to 4.5 lb ae of triclopyr) may be used with a picloram and 2,4-D acid product or 2,4-D 3.8 lb low volatile ester in a tank mix combination in a total spray volume of 10 to 30 gallons per acre. Use a non-ionic agricultural surfactant for all foliar applications as described under Directions for Use.

Note: Conifers planted sooner than one month after treatment with **TRYCERA**® at less than 5.7 quarts (4 lb ae of triclopyr) per acre or sooner than two months after treatment at 5.7 to 12.6 quarts of **TRYCERA**® (4 to 9 lb ae of triclopyr) per acre may be injured. When tank mixtures of herbicides are used for forest site preparation, consult labels for all products in the mixture and the longest recommended waiting period before planting observed.

Directed Spray Applications for Conifer Release

To release conifers from competing hardwoods such as red maple, sugar maple, striped maple, sweetgum, red and white oaks, ash, hickory, alder, birch, aspen, and pin cherry, mix 4.2 to 8.4 quarts of **TRYCERA**® (3 to 6 lb ae of triclopyr) in enough water to make 100 gallons of spray mixture. To improve spray coverage, add an agriculturally labeled non-ionic surfactant as described under Directions for Use. The spray mixture should be directed onto foliage of competitive hardwoods using knapsack or backpack sprayers with flat fan nozzles or equivalent any time after hardwoods have reached full leaf size, but before autumn coloration. The majority of treated hardwoods should be less than 6 feet in height to ensure adequate spray coverage. Take care to direct spray away from contact with conifer foliage, particularly foliage of desirable pines.

Note: Spray may cause temporary damage and growth suppression where contact with conifers occurs; however, injured conifers should recover and grow normally. Over-the-top spray applications can kill pines.

Broadcast Applications for Conifer Release in the Northeastern United States

To release spruce, fir, red pine and white pine from competing hardwoods, such as red maple, sugar maple, striped maple, alder, birch (white, yellow or gray), aspen, ash, pin cherry and *Rubus* spp. and perennial and annual broadleaf weeds, use **TRYCERA**® at rates of 2.1 to 4.2 quarts (1.5 to 3 lb ae of triclopyr) per acre alone or with 2,4-D amine or 2,4-D ester. Apply in late summer or early fall after conifers have formed their over wintering buds and hardwoods are in full leaf and prior to autumn coloration.

Broadcast Applications for Douglas Fir Release in the Pacific Northwest and California (product not currently registered for use in California)

To release Douglas fir from susceptible competing vegetation such as broadleaf weeds, alder, blackberry or Scotch broom, apply **TRYCERA**® at 1.4 to 2.1 quarts (1 to 1.5 lb ae of triclopyr) per acre alone or in combination with atrazine. Mix all sprays in a water carrier with a non-ionic surfactant. Apply in early spring after hardwoods begin growth and before Douglas fir bud break ("early foliar hardwood stage) or after Douglas fir seasonal growth has "hardened off" (set winter buds) in late summer, but while hardwoods are still actively growing. When treating after Douglas fir bud set, apply prior to onset of autumn coloration in hardwood foliage.

Note: Treatments applied during active Douglas fir shoot growth (after spring bud break and prior to bud set) may cause injury to Douglas fir trees.

BASAL BARK AND DORMANT BRUSH TREATMENTS

To control susceptible woody plants in rights-of-way, other non-crop areas, and forests, use **TRYCERA**® in oil or oil-water mixtures prepared and applied as described below. When preparing mixtures, use oils as either a commercially available basal oil, diesel fuel. Substitute other oils or diluents only as recommended by the oil or diluents manufacturer. When mixing with a basal oil or other oils or diluents, read and follow the use directions and precautions on the product label prepared by the oil or diluents manufacturer. See Table 1 for relationship between mixing rate, spray volume and maximum application rate.

Oil Mixture Sprays

Add **TRYCERA**® to the required amount of oil in the spray tank or mixing tank and mix thoroughly. If the mixture stands over 4 hours, re-agitation is required.

Oil Mixtures of TRYCERA® and Picloram: **TRYCERA**® and a picloram formulation may be used in tank mix combination for basal bark treatment of woody plants. These herbicides are incompatible and will not form a stable mixture when mixed together directly in oil. Stable tank mixtures for basal bark application can be made if each product is first combined with a compatibility agent prior to final mixing in the desired ratio. (See product bulletin for mixing instructions.)

Oil-Water Mixture Sprays

First, premix **TRYCERA®** oil and surfactant in a **separate container**. **Do not allow** any water or mixtures containing water to get into the **TRYCERA®** or the premix. Fill the spray tank about half full with water, then slowly add the premix with continuous agitation and complete filling the tank with water. Continue moderate agitation.

Note: If the premix is put in the tank without any water, the first water added may form a thick invert (water in oil) emulsion which will be hard to break.

Basal Bark Treatment

To control susceptible woody plants with stems less than 6 inches in basal diameter, mix 1 to 5.2 gallons of **TRYCERA®** in enough oil to make 100 gallons of spray mixture. Apply with knapsack sprayer or power spraying equipment using low pressure (20-40 psi). Spray the basal parts of brush and tree trunks to a height of 12 to 15 inches from the ground. Thorough wetting of the indicated area is necessary for good control. Spray until runoff at the ground line is noticeable. Old or rough bark requires more spray than smooth young bark. Apply anytime, including the winter months, except when snow or water prevent spraying to the ground line.

Low Volume Basal Bark Treatment

To control susceptible woody plants with stems less than 6 inches in basal diameter, mix 20.8 to 31.4 gallons of **TRYCERA®** in enough oil to make 100 gallons of spray mixture. Apply with a backpack or knapsack sprayer using low pressure and a solid cone or flat fan nozzle. Spray the basal parts of brush and tree trunks in a manner that thoroughly wets the lower stems, including the root collar area, but not to the point of runoff. Herbicide concentration should vary with size and susceptibility of species treated. Apply at any time, including the winter months, except when snow or water prevent spraying to the ground line or when stem surfaces are saturated with water. See Table 1 for relationship between mixing rate, spray volume and maximum application rate.

TRYCERA® Plus Picloram in Oil Tank Mix: **TRYCERA®** and a picloram product may be applied as a low volume basal bark treatment to improve control of certain woody species such as ash, elm, maple, poplar, aspen, hackberry, oak, oceanspray, birch, hickory, pine, tanoak, cherry, locust, sassafras, and multiflora rose. (See product bulletin for mixing instructions.)

Streamline Basal Bark Treatment (Southern States)

To control or suppress susceptible woody plants for conifer release, mix 20.8 to 31.4 gallons of **TRYCERA®** in enough oil to make 100 gallons of spray mixture. Apply with a backpack or knapsack sprayer using equipment that provides a directed straight stream spray. Apply sufficient spray to one side of stems less than 3 inches in basal diameter to form a treated zone that is 6 inches in height. When the optimum amount of spray mixture is applied, the treated zone should widen to encircle the stem within approximately 30 minutes. Treat both sides of stems which are 3 to 4 inches in basal diameter. Direct the spray at bark that is approximately 12 to 24 inches above ground. Pines (loblolly, slash, shortleaf, and Virginia) up to 2 inches in diameter breast height (dbh) can be controlled by directing the spray at a point approximately 4 feet above ground. Vary spray mixture concentration with size and susceptibility of the species being treated. Best results are achieved when applications are made to young vigorously growing stems that have not developed the thicker bark characteristic of slower growing, understory trees in older stands. This technique is not recommended for scrub and live oak species, including blackjack, turkey, post, live, bluejack and laurel oaks, or big leaf maple. Apply from approximately 6 weeks prior to hardwood leaf expansion in the spring until approximately 2 months after leaf expansion is completed. Do not apply when snow or water prevent spraying at the desired height above ground level.

Low Volume Stem Bark Band Treatment (North Central and Lake States)

To control susceptible woody plants with stems less than 6 inches in basal diameter, mix 20.8 to 31.4 gallons of **TRYCERA®** in enough oil to make 100 gallons of spray mixture. Apply with a backpack or knapsack sprayer using low pressure and a solid cone or flat fan nozzle. Apply the spray in a 6 to 10 inch wide band that completely encircles the stem. Spray in a manner that completely wets the bark, but not to the point of runoff. The treatment band may be positioned at any height up to the first major branch. For best results apply the band as low as possible. Spray mixture concentration should vary with size and susceptibility of species to be treated. Applications may be made anytime, including winter months.

Thinline Basal Bark Treatment

To control susceptible woody plants with stems less than 6 inches in diameter, apply **TRYCERA®** either undiluted or mixed at 50-75% v/v with oil in a thin stream to all sides of the lower stems. Direct the stream horizontally to apply a narrow band around each stem or clump. Use a minimum of 2 to 15 mL of **TRYCERA®** or oil mixture with **TRYCERA®** to treat single stems and from 25 to 100 mL to treat clumps of stems. Use an applicator metered or calibrated to deliver the small amounts required.

Dormant Stem Treatment

Dormant stem treatments will control susceptible woody plants and vines with stems less than 2 inches in diameter. Plants with stems greater than 2 inches in diameter may not be controlled and re-sprouting may occur. This treatment method is best suited for sites with dense, small diameter brush. Dormant stem treatments of **TRYCERA®** can also be used as a chemical side-trim for controlling lateral branches of larger trees that encroach onto roadside, utility, or other rights-of-way. Mix 4.5 to 8.4 quarts of **TRYCERA®** in 2 to 3 gallons of crop oil concentrate such as Agridex or other recommended oil and add this mixture to enough water to make 100 gallons of spray solution. Use continuous adequate agitation. Apply with Radiarc, OC or equivalent nozzles, or handgun using 70 to 100 gallons of spray per acre to ensure uniform coverage of stems. **TRYCERA®** may be mixed with 2,4-D ester formulation to improve the control of black cherry and broaden the spectrum of herbicidal activity. In western states, apply any time after woody plants are dormant. In other areas apply anytime within 10 weeks of budbreak, generally February through April. Do not apply to wet or saturated bark as poor control may result.

Cut Surface Treatments

To control unwanted trees of hardwood species such as elm, maple, oak and conifers in labeled sites, apply **TRYCERA®** specialty herbicide, either undiluted or diluted in a 1 to 1 ratio with water, as directed below.

With Tree Injector Method

Apply by injecting ½ mL of undiluted **TRYCERA®** or 1 mL of the diluted solution through the bark at intervals of 3 to 4 inches between centers of the injector wound. The injections should completely surround the tree at any convenient height. **Note:** No Worker Protection Standard worker entry restrictions or worker notification requirements apply when this product is injected directly into plants.

With Hack and Squirt Method

Make cuts around the tree trunk at a convenient height with a hatchet or similar equipment so that the cuts overlap slightly and make a continuous circle around the trunk. Spray ½ mL of undiluted **TRYCERA®** or 1 mL of the diluted solution into the pocket created between the bark and the inner stem/trunk by each cut.

With Frill or Girdle Method

Make a single girdle through the bark completely around the tree at a convenient height. The frill should allow for the herbicide to remain next to the inner stem and absorb into the plant. Wet the cut surface with undiluted or diluted solution.

Both of the above methods may be used successfully at any season except during periods of heavy sap flow of certain species – for example, maples.

Stump Treatment

Spray or paint the cut surfaces of freshly cut stumps and stubs with undiluted **TRYCERA®**. The cambium area next to the bark is the most vital area to wet.

CHRISTMAS TREE PLANTATIONS

Use **TRYCERA®** for the control of woody plants and annual and perennial broadleaf weeds in established Christmas tree plantations. For best results, apply when woody plants and weeds are actively growing. **TRYCERA®** does not control weeds which have not emerged at the time of application. If lower rates are used on hard to control woody species, re-sprouting may occur the year following treatment. Brush over 8 feet tall is difficult to treat efficiently using hand equipment such as backpack or knapsack sprayers. When treating large brush or trees or hard to control species such as ash, blackgum, choke cherry, elm, hazel, madrone, maples, oaks or sweetgum, and for applications made during drought conditions or in late summer when the leaves are mature, use the higher rates of **TRYCERA®** or use cut surface application methods. For foliar applications, apply in enough water to give uniform and complete coverage of the plants to be controlled. Applications made under drought conditions may provide less than desirable results.

Use Precautions and Restrictions for Christmas Tree Plantations

- Do not use on newly seeded grass until well established as indicated by vigorous growth and development of secondary root system and tillering.
- Mow newly seeded turf (alleyways, etc.) two or three times before any treatment with **TRYCERA®**.
- Do not reseed Christmas tree areas treated with **TRYCERA®** for a minimum of three weeks after application.

- Do not use **TRYCERA®** if legumes, such as clover, are present and injury cannot be tolerated.
- Do not tank mix with 2,4-D for use in Christmas tree plantations.
- Apply **TRYCERA®** only to established Christmas trees that have been planted at least one full year prior to application.
- To prevent injury, take care to direct spray away from Christmas tree foliage to avoid contact.
- Sprays applied directly to Christmas trees may result in conifer injury.
- When treating unwanted vegetation in Christmas tree plantations, take care to direct sprays away from conifers.

Spray Preparation

The order of addition to the spray tank is water, drift control agent (if used), non-ionic agricultural surfactant and **TRYCERA®**. Continue moderate agitation while mixing and spraying. Use a non-ionic agricultural surfactant for all applications. When using surfactants, follow use directions and precautions listed on the manufacturer's label. Use the higher recommended concentrations of surfactant in the spray mixture when applying lower spray volumes per acre.

Application

Apply in late summer or early autumn after terminal growth of Christmas trees has hardened of, but before leaf drop of, target weeds. Apply at a rate of 1.0 to 2.4 quarts of **TRYCERA®** (0.75 to 1.75 lb ae of triclopyr) per acre as a foliar spray directed toward the base of Christmas trees. Use sufficient spray volume to provide uniform coverage of target plants (20 to 100 gallons per acre). Do not apply with 2,4-D. Application rates of **TRYCERA®** listed for Christmas trees will only suppress some well-established woody plants that are greater than 2 to 3 years old (see table below). Broadcast sprays may also be applied in bands between the rows of planted trees. Use spray equipment that will assure uniform coverage of the desired spray volume.

Spray solution from TRYCERA® can cause needle and branch injury to Christmas trees. To minimize injury to Christmas trees, direct sprays so as to minimize contact with foliage. Blue spruce, white spruce, balsam fir and Fraser fir are less susceptible to injury than white pine and Douglas fir.

Application Rates and Species Controlled in Established Christmas Tree		
1 quart/acre (0.75 lb ae of triclopyr)	2.1 quarts/acre (1.5 lb ae of triclopyr)	2.4 quarts/acre (1.75 lb ae of triclopyr)
clover dandelion dock, curly lambquarters lespedeza plantain, broadleaf plantain, buckhorn ragweed, common vetch	bindweed, field (TG) blackberry* chicory (S) fireweed ivy, ground lettuce, wild oxalis poison ivy smartweed (TO) thistle, Canada (TG) violet, wild Virginia creeper*	arrowwood (SDL) aspen beech (SDL) birch (SDL) chinquapin cottonwood (SDL) elderberry grape, wild mulberry (SDL) poplar (SDL) sassafras (SDL) sumac (SDL) sycamore (SDL)

(TG) Top growth control, retreatment may be necessary

(S) Suppression

(SDL) Seedlings less than 2 to 3 years old

*Use 4 pint per acre rate

Directed Applications

To control hardwoods such as red maple, sugar maple, striped maple, sweetgum, red and white oaks, ash, alder, birch, aspen, and pin cherry, mix 5.2 to 29.1 fl oz of **TRYCERA**® in enough water to make 3 gallons of spray mixture. For directed applications, do not exceed 8.4 quarts of **TRYCERA**® (6 lb ae of triclopyr) per acre per year. To improve coverage, add a non-ionic agricultural surfactant to the spray. Direct this spray mixture onto foliage of competitive hardwoods using knapsack or backpack sprayers with flat fan nozzles or equivalent any time after hardwoods have reached full leaf size, but before autumn *coloration* (when plants are actively growing). The majority of treated hardwoods should be less than 8 feet in height to ensure adequate spray coverage.

Note: To prevent Christmas tree injury, take care to direct spray away from contact with Christmas tree foliage.

Cut Surface Treatments

When treating large brush or trees or hard to control species such as ash, blackgum, choke cherry, elm, hazel, madrone, maples, oaks, salt cedar or sweetgum, and for applications made during drought conditions or in late summer when the leaves are mature, use cut surface treatments. (See directions for Cut Surface Treatments in preceding section of this label.)

WETLAND SITES IN PRODUCTION FORESTS AND INDUSTRIAL NON-CROP AREAS

TRYCERA® specialty herbicide may be used within production forests and industrial non-crop sites to control target vegetation in and around standing water sites, such as marshes, wetlands, and the banks of ponds and lakes and transition areas between upland and lowland sites.

For control of woody plants and broadleaf weeds in these sites, follow use directions and application methods on this label for forestry and non-cropland sites.

Use Precautions

Minimize overspray to open water when treating target vegetation in and around non-flowing, quiescent or transient water. When making applications to control unwanted plants on banks or shorelines of flowing water, minimize overspray to open water. **Note:** Consult local public water control authorities before applying this product in and around public water. Permits may be required to treat such areas.

Product Information for Aquatic and Wetland Sites

Use **TRYCERA**® specialty herbicide for control of emersed, submersed and floating aquatic plants in aquatic sites such as ponds, lakes, reservoirs, non-irrigation canals, and ditches which have little or no continuous outflow, marshes and wetlands, including broadleaf and woody vegetation on banks and shores within or adjacent to these and other aquatic sites.

Obtain Required Permits: Consult with appropriate state or local water authorities before applying this product to public waters. State or local public agencies may require permits.

Use Precautions and Restrictions

In Arizona: The state of Arizona has not approved **TRYCERA**® for use on plants grown for commercial production, specifically forests grown for commercial timber production, or on designated grazing areas.

When applying this product in tank mix combination, follow all applicable use directions, precautions and limitations on each manufacturer's label.

Chemigation: Do not apply this product through any type of irrigation system.

Irrigation: Do not use treated water for irrigation for 120 days following application. As an alternative to waiting 120 days, treated water may be used for irrigation once the triclopyr level in the intake water is determined to be non-detectable by laboratory analysis (immunoassay). There is no restriction on use of water from the treatment area to irrigate established grasses.

Water treated with **TRYCERA**® may not be used for irrigation purposes for 120 days after application or until residue levels of **TRYCERA**® are determined by laboratory analysis, or other appropriate means of analysis, to be 1 ppb or less.

Seasonal Irrigation Waters: **TRYCERA**® may be applied during the off-season to surface waters that are used for irrigation on a seasonable basis provided that there is a *minimum* of 120 days between applying **TRYCERA**® and the first use of treated water for irrigation purposes, or until residue levels of **TRYCERA**® are determined by laboratory analysis, or other appropriate means of analysis, to be 1 ppb or less.

AQUATIC WEED CONTROL

Irrigation Canals/Ditches: Do not apply **TRYCERA**® to irrigation canals/ditches unless the 120-day restriction on irrigation water usage can be observed or residue levels of **TRYCERA**® are determined by laboratory analysis, or other appropriate means of analysis, to be 1 ppb or less. Do not apply **TRYCERA**® directly to, or otherwise permit it to come into direct contact with grapes, tobacco, vegetable crops, flowers, or other desirable broadleaf plants, and do not permit spray mists containing it to drift into them.

- Do not apply to salt water bays or estuaries.
- Do not apply directly to un-impounded rivers or streams.
- Do not apply on ditches or canals currently being used to transport irrigation water or that will be used for irrigation within 4 months following treatment. It is permissible to treat irrigation and non-irrigation ditch banks.
- Do not apply where runoff water may flow onto agricultural land as injury to crops may result.
- When making applications to control unwanted plants on banks or shorelines of moving water sites, minimize overspray to open water.
- Do not apply using a mistblower.

Precautions for Potable Water Intakes for Emerged Aquatic Weed Control

See chart below for specific setback distances near functioning potable water intakes. **Note:** Existing potable water intakes which are no longer in use, such as those replaced by potable water wells or connections to a municipal water system, are not considered to be functioning potable water intakes. These setback restrictions do not apply to terrestrial applications made adjacent to potable water intakes.

Area Treated (acres)	TRYCERA® Application Rate, qts./acre			
	2.1 qts./acre	4.2 qts./acre	6.4 qts./acre	8.4 qts./acre
	Setback Distance (ft.)			
4	0	200	400	500
>4-8	0	200	700	900
>8-16	0	200	700	1000
>16	0	200	900	1300

Precautions for Potable Water Intakes for Submerged Aquatic Weed Control

For applications of **TRYCERA**® to control submerged weeds in lakes, reservoirs, or ponds that contain a functioning potable water intake for human consumption, see the chart below to determine the minimum setback distances of the application from the functioning potable water intakes.

Area Treated (acres)	Concentration of Triclopyr Acid in Water (ppm ae)				
	0.75 ppm	1.0 ppm	1.5 ppm	2.0 ppm	2.5 ppm
	Required Setback Distance (ft.) from Potable Water Intake				
<4	300	400	600	800	1000
>4-8	420	560	840	1120	1400
>8-16	600	800	1200	1600	2000
>16-32	780	1040	1560	2080	2600
>32 acres, calculate a setback using the formula for the appropriate rate	Setback (ft.) = $(800^* \text{ In [acres]} - 160)/3.33$	Setback (ft.) = $(800^* \text{ In [acres]} - 160)/2.50$	Setback (ft.) = $(800^* \text{ In [acres]} - 160)/1.67$	Setback (ft.) = $(800^* \text{ In [acres]} - 160)/1.25$	Setback (ft.) = $(800^* \text{ In [acres]} - 160)$

Example Calculation 1: to apply 2.5 ppm **TRYCERA**® to 50 acres:

$$\begin{aligned}\text{Setback in feet} &= (800 \times \ln(50 \text{ acres}) - 160) \\ &= (800 \times 3.912) - 160 \\ &= 2,970 \text{ feet}\end{aligned}$$

Example Calculation 2: to apply 0.75 ppm **TRYCERA**® to 50 acres:

$$\begin{aligned}\text{Setback in feet} &= \frac{(800 \times \ln(50 \text{ acres}) - 160)}{3.33} \\ &= \frac{(800 \times 3.912) - 160}{3.33} \\ &= 892 \text{ feet}\end{aligned}$$

Note: Existing potable water intakes which are no longer in use, such as those replaced by potable water wells or connections to a municipal water system, are not considered to be functioning potable water intakes. These setback restrictions do not apply to terrestrial applications made adjacent to potable water intakes.

To apply **TRYCERA**® around and within the distances noted above from a functioning potable water intake, the intake must be turned off until the triclopyr level in the intake water is determined to be 0.4 parts per million (ppm) or less by laboratory analysis or immunoassay.

- Recreational Use of Water in Treatment Area: There are no restrictions on use of water in the treatment area for recreational purposes, including swimming and fishing.
- Livestock Use of Water from Treatment Area: There are no restrictions on livestock consumption of water from the treatment area.

Aquatic Weeds		
Alligatorweed	Nuphar (spatterdock)	Waterhyacinth
American lotus	Parrotfeather*	Waterlily
American frogbit	Phragmites	Waterprimrose
Aquatic sodaapple	Pickerelweed	Watershield
Eurasian watermilfoil	Pennywort	
Milfoil species	Purple loosestrife	

*Re-treatment may be needed to achieve desired level of control.

APPLICATION METHODS

Floating and Emerged Weeds

For control of waterhyacinth, alligatorweed (see specific directions below), and other susceptible emerged and floating herbaceous weeds and woody plants, apply 2.1 to 8.4 quarts of **TRYCERA**® specialty herbicide (1 ½ to 6 lb ae of triclopyr) per acre as a foliar application using surface or aerial equipment. Use higher rates in the rate range when plants are mature, when the weed mass is dense, or for difficult to control species. Repeat as necessary to control regrowth and plants missed in the previous operation, but do not exceed a total of 8.4 quarts of **TRYCERA**® (6 lb ae of triclopyr) per acre per annual growing season.

Use a non-ionic surfactant in the spray mixture to improve control. Follow all directions and use precautions on the aquatic surfactant label.

Apply when plants are actively growing.

Surface Application

Use a spray boom, handgun or other similar suitable equipment mounted on a boat or vehicle. Thorough wetting of foliage is essential for maximum effectiveness. Use 20 to 200 gallons per acre of spray mixture. Special precautions such as the use of low spray pressure, large droplet producing nozzles or addition of a labeled thickening agent may minimize spray drift in areas near sensitive crops.

Aerial Application (Helicopter Only)

Apply with a helicopter using a Microfoil or Thru-Valve boom, or a drift control additive in the spray solution. Apply in a minimum of 10 gallons of total spray mix per acre. Do not apply when weather conditions favor drift to sensitive areas. See label section on aerial application directions and precautions.

Waterhyacinth (*Eichhornia crassipes*)

Apply **TRYCERA**® at 2.1 to 8.4 quarts (1.5 to 6 lb ae of triclopyr) per acre to control water hyacinth. Apply when plants are actively growing. Use the higher rate in the rate range when the weed mass is dense. It is important to thoroughly wet all foliage with the spray mixture. Use a non-ionic surfactant in the spray mixture. A repeat treatment may be needed to control regrowth or plants missed in the previous treatment.

Alligatorweed (*Alternanthera philoxeroides*)

Apply **TRYCERA**® at 2.8 to 8.4 quarts (2 to 6 lb ae of triclopyr) per acre to control a Alligatorweed. It is important to thoroughly wet all foliage with the spray mixture. For best results, add an approved non-ionic aquatic surfactant to the spray mixture. Alligatorweed growing outside the margins of a body of water can be controlled with this treatment. However, alligatorweed growing in water will only be partially controlled. Top growth above the water will be controlled, but the plant will likely regrow from tissue below the water surface.

Precautions for Potable Water Intakes – Lakes, Reservoirs, Ponds:

For applications of **TRYCERA**® to control floating and emerged weeds in lakes, reservoirs or ponds that contain a functioning potable water intake for human consumption, see chart below to determine the minimum setback distances of the application from the functioning potable water intakes.

Area Treated (acres)	TRYCERA Application Rate, qts./acre			
	2.1 qts./acre	4.2 qts./acre	6.4 qts./acre	8.4 qts./acre
<4	0	200	400	500
>4-8	0	200	700	900
>8-16	0	200	700	1000
>16	0	200	900	1300

Note: Existing potable water intakes which are no longer in use, such as those replaced by potable water wells or connections to a municipal water system, are not considered to be functioning potable water intakes. These setback restrictions do not apply to terrestrial applications made adjacent to potable water intakes.

To apply **TRYCERA**® around and within the distances noted above from a functioning potable water intake, the intake must be turned off until the triclopyr level in the intake water is determined to be 0.4 parts per million (ppm) or less by laboratory analysis or immunoassay.

- **Recreational Use of Water in Treatment Area:** There are no restrictions on use of water in the treatment area for recreational purposes, including swimming and fishing.
- **Livestock Use of Water from Treatment Area:** There are no restrictions on livestock consumption of water from the treatment area.

Submerged Weeds

For control of Eurasian watermilfoil (*Myriophyllum spicatum*) and other susceptible submerged weeds in ponds, lakes, reservoirs, and in non-irrigation canals or ditches that have little or no continuous outflow, apply **TRYCERA**® as either a surface or subsurface application. Rates should be selected according to the rate chart below to provide a triclopyr concentration of 0.75 to 2.5 ppm ae in treated water. Use higher rates in the rate range in areas of greater water exchange. These areas may require a repeat application. However, total application of **TRYCERA**® must not exceed an application rate of 2.5 ppm of triclopyr for the treatment area **per** annual growing season.

Apply in spring or early summer when Eurasian watermilfoil or other submersed weeds are actively growing.

Areas near susceptible crops or other desirable broadleaf plants may be treated by subsurface injection applied by boat to avoid spray drift.

Subsurface Application

Apply desired amount of **TRYCERA®** per acre directly into the water through boat-mounted distribution systems. When treating target plants that are 6 feet below the surface of the water, trailing hoses should be used along with an aquatic approved sinking agent (except California).

Surface Application

Apply the desired amount of **TRYCERA®** as either a concentrate or a spray mixture in water. However, use a minimum spray volume of 5 gallons per acre. Do not apply when weather conditions favor drift to sensitive areas.

Average water depth (feet) x 0.905 x target concentration (ppm) = gallons of **TRYCERA®** per surface acre treated.

Example: to achieve a 2 ppm concentration of triclopyr in water averaging 4 feet deep
 $4 \times 0.905 \times 2 \text{ ppm} = 7.2 \text{ gallons of TRYCERA® per surface acre treated.}$

Concentration of Triclopyr Acid in Water (ppm ae)					
Water Depth (ft.)	0.75 ppm	1 ppm	1.5 ppm	2 ppm	2.5 ppm
	Gallons of TRYCERA® per Surface Acre at Specified Depth				
1	0.7	0.9	1.4	1.8	2.3
2	1.4	1.8	2.7	3.6	4.6
3	2.1	2.7	4.1	5.4	6.8
4	2.7	3.6	5.4	7.2	9.1
5	3.4	4.5	6.8	9	11.36
6	4.1	5.4	8.1	10.9	13.6
7	4.8	6.3	9.5	12.7	15.8
8	5.5	7.2	10.9	14.5	18.1
9	6.1	8.1	12.2	16.3	20.4
10	6.8	9	13.6	18.1	22.6
15	10.2	13.6	20.4	27.2	33.9
20	13.6	18.1	27.2	36.2	45.3

Precautions for Potable Water Intakes – Lakes, Reservoirs, Ponds:

For applications of **TRYCERA®** to control submerged weeds in lakes, reservoirs or ponds that contain a functioning potable water intake for human consumption, see the chart below to determine the minimum setback distances of the application from the functioning potable water intakes.

Area Treated (acres)	Concentration of Triclopyr Acid in Water (ppm ae)				
	0.75 ppm	1.0 ppm	1.5 ppm	2.0 ppm	2.5 ppm
	Required Setback Distance (ft.) from Potable Water Intake				
<4	300	400	600	800	1000
>4-8	420	560	840	1120	1400
>8-16	600	800	1200	1600	2000
>16-32	780	1040	1560	2080	2600
>32 acres, calculate a setback using the formula for the appropriate rate	Setback (ft.) = $(800^* \text{ In [acres]} - 160)/3.33$	Setback (ft.) = $(800^* \text{ In [acres]} - 160)/2.50$	Setback (ft.) = $(800^* \text{ In [acres]} - 160)/1.67$	Setback (ft.) = $(800^* \text{ In [acres]} - 160)/1.25$	Setback (ft.) = $(800^* \text{ In [acres]} - 160)/3.33$

Example Calculation 1: to apply 2.5 ppm **TRYCERA**® to 50 acres:

$$\begin{aligned}\text{Setback in feet} &= (800 \times \ln(50 \text{ acres}) - 160) \\ &= (800 \times 3.912) - 160 \\ &= 2,970 \text{ feet}\end{aligned}$$

Example Calculation 2: to apply 0.75 ppm **TRYCERA**® to 50 acres:

$$\begin{aligned}\text{Setback in feet} &= \frac{(800 \times \ln(50 \text{ acres}) - 160)}{3.33} \\ &= \frac{(800 \times 3.912) - 160}{3.33} \\ &= 892 \text{ feet}\end{aligned}$$

Note: Existing potable water intakes which are no longer in use, such as those replaced by potable water wells or connections to a municipal water system, are not considered to be functioning potable water intakes. These setback restrictions do not apply to terrestrial applications made adjacent to potable water intakes.

To apply **TRYCERA**® around and within the distances noted above from a functioning potable water intake, the intake must be turned off until the triclopyr level in the intake water is determined to be 0.4 parts per million (ppm) or less by laboratory analysis or immunoassay.

- Recreational Use of Water in Treatment Area: There are no restrictions on use of water in the treatment area for recreational purposes, including swimming and fishing.
- Livestock Use of Water from Treatment Area: There are no restrictions on livestock consumption of water from the treatment area.

Wetland Sites

Wetlands include flood plains, deltas, marshes, swamps, bogs, and transitional areas between upland and lowland sites. Wetlands may occur within forests, wildlife habitat restoration and management areas, and similar sites as well as areas adjacent to or surrounding domestic water supply reservoirs, lakes and ponds.

For control of woody plants and broadleaf weeds in these sites, follow use directions and application methods on this label for terrestrial sites associated with wetland areas.

Use Precautions

Minimize overspray to open water when treating target vegetation in and around non-flowing, quiescent or transient water. When making applications to control unwanted plants on banks or shorelines of flowing water, minimize overspray to open water. **Note:** Consult local public water control authorities before applying this product in and around public water. Permits may be required to treat such areas.

Purple Loosestrife (*Lythrum salicaria*)

Purple loosestrife can be controlled with foliar applications of **TRYCERA**®. For broadcast applications, use a minimum of 6.4 to 8.4 quarts of **TRYCERA**® (4.5 to 6 lb ae of triclopyr) per acre. Apply **TRYCERA**® when purple loosestrife is at the bud to mid-flowering stage of growth. Follow-up applications for control of re-growth can be made the following year in order to achieve increased control of this weed species. For all applications, add a non-ionic surfactant to the spray mixture. Follow all directions and use precautions on the label of the surfactant. Thorough wetting of the foliage and stems is necessary to achieve satisfactory control. A minimum spray volume of 50 gallons per acre is recommended for ground broadcast applications.

If using a backpack sprayer, use a spray mixture containing 1% to 1.5% **TRYCERA**® or 5.1 to 7.7 fl oz of **TRYCERA**® per 4 gallons of water. Thoroughly wet all purple loosestrife plants.

Phragmites (*Phragmites australis*)

Phragmites can be selectively controlled with foliar applications of **TRYCERA**®. For broadcast applications, use a minimum of 3.1 quarts of **TRYCERA**® (2.25 lb. ae of triclopyr) per acre. For optimum control, apply **TRYCERA**® when phragmites is in the early sate of growth, ½ to 3 feet in height, prior to seed head development. Follow-up applications for control of regrowth may be made the following year in order to achieve increased control of this weed species. For all applications, add a non-ionic surfactant labeled for aquatic to the spray mixture. Follow all directions and use precautions on the label of the surfactant. Thorough wetting of the foliage and stems is necessary to achieve use precautions on the label of the surfactant. Thorough wetting of the foliage and stems is necessary to achieve satisfactory control. A minimum spray volume of 50 gallons per acre is recommended for ground broadcast applications.

If a backpack sprayer is used, use a spray mixture containing 1% to 1.5% of **TRYCERA**® or 5.1 to 7.7 fl. oz. of **TRYCERA**® per 4 gallons of water. Thoroughly wet all phragmites foliage.

Aerial application by helicopter may be needed when treating restoration sites that are inaccessible, remote, difficult to traverse, isolated, or otherwise unsuited to ground application, or in circumstances where invasive exotic weeds dominate native plant populations over extensive areas and efforts to restore native plant diversity are conducted. By air, apply in a minimum spray volume of 30 gallons per acre using Thru-Valve or Microfoil boom only.

- **Recreational Use of Water in Treatment Area:** There are no restrictions on use of water in the treatment area for recreational purposes, including swimming and fishing.
- **Livestock Use of Water from Treatment Area:** There are no restrictions on livestock consumption of water from the treatment area.

TERRESTRIAL SITES ASSOCIATED WITH WETLAND AREAS

- Apply no more than 2.8 quarts of **TRYCERA**® (2 lb ae of triclopyr) per acre per growing season on range and pasture sites, including rights-of-way, fence rows or any area where harvesting is allowed. For areas where grazing is allowed, use a maximum single application of 1 lb. ae of triclopyr (1.4 quarts of **TRYCERA**®) per acre per growing season.
- On forestry sites, **TRYCERA**® may be used at rates up to 8.4 quarts of **TRYCERA**® (6 lb ae of triclopyr) per acre per year.

Use **TRYCERA**® specialty herbicide at rates of 1.1 to 8.4 quarts of **TRYCERA**® (0.75 to 6 lb ae of triclopyr) per acre to control broadleaf weeds and woody plants. In all cases use the amount specified in enough water to give uniform and complete coverage of the plants to be controlled. Use only water suitable for spraying. Use a labeled non-ionic surfactant for all foliar applications. When using surfactants, follow the use directions and precautions listed on the surfactant manufacturer's label. Use the higher recommended concentrations of surfactant in the spray mixture when applying lower spray volumes per acre. The order of addition to the spray tank is water, spray thickening agent (if used), additional herbicide (if used), and **TRYCERA**®. Add a labeled aquatic surfactant to the spray tank last or as recommended on the product label. If combined with emulsifiable concentrate herbicides, moderate continuous adequate agitation is required.

Before using any recommended tank mixtures, read the directions and all use precautions on both labels.

For best results, apply when woody plants and weeds are actively growing. When hard to control species such as ash, blackgum, choke cherry, maples, or oaks are prevalent and during applications made in late summer when the plants are mature and during drought conditions, use the higher rates of **TRYCERA**®.

When using **TRYCERA**® in combination with a 2,4-D herbicide approved for aquatic use, such as Hardball®, generally the higher rates should be used for satisfactory brush control.

Use the higher dosage rates when brush approaches an average of 15 feet in height or when the brush covers more than 60% of the area to be treated. If lower rates are used on hard to control species, re-sprouting may occur the year following treatment.

High Volume Foliage Treatment

For control of woody plants, use **TRYCERA**® at the rate of 4.2 to 8.4 quarts (3 to 6 lb ae of triclopyr) per 100 gallons of spray solution, or **TRYCERA**® at 1.1 to 4.2 quarts (3/4 to 3 lb ae of triclopyr) may be tank mixed with 2,4-D 3.8 lb amine, like Opti-Amine®, diluted to make 100 gallons of spray solution. Apply at a volume of 100 to 400 gallons of total spray per acre depending upon size and density of woody plants. Coverage should be thorough to wet all leaves, stems, and root collars. (See Use Precautions and Restrictions.) Do not exceed the maximum allowable use rate of 2 gallons of **TRYCERA**® (6 lb ae of triclopyr) per acre per growing season.

Low Volume Foliage Treatment

To control susceptible woody plants, apply up to 12.6 quarts of **TRYCERA**® (9 lb ae of triclopyr) in 10 to 100 gallons of finished spray. The spray concentration of **TRYCERA**® and total spray volume per acre may be adjusted according to the size and density of target woody plants and kind of spray equipment used. With low volume sprays, use sufficient spray volume to obtain uniform coverage of target plants including the surfaces of all foliage, stems, and root collars (see Use Precautions and Restrictions). For best results, add a labeled aquatic surfactant to all spray mixtures. Match equipment and delivery rate of spray nozzles to height and density of woody plants. When treating tall, dense brush, a truck mounted spray gun with spray tips that deliver up to 2 gallons per minute at 40 to 60 psi may be required. Backpack or other types of specialized spray equipment with spray tips that deliver less than 1 gallon of spray per minute may be appropriate for short, low to moderate density brush.

Cut Surface Treatments (Woody Plants)

To control unwanted trees and other listed woody plants, apply **TRYCERA®**, either undiluted or diluted in a 1 to 1 ratio with water as directed below.

With Tree Injector Method

Apply by injecting ½ mL of undiluted **TRYCERA®** or 1 mL of the diluted solution through the bark at intervals of 3 to 4 inches between centers of the injector wound. The injections should completely surround the tree at any convenient height. **Note: No Worker Protection Standard worker entry restrictions or worker notification requirements apply when this product is injected directly into plants.**

With Hack and Squirt Method

Make cuts at a convenient height around the tree trunk with a hatchet or similar equipment so that the cuts overlap slightly and make a continuous circle around the trunk. Spray ½ mL of undiluted **TRYCERA®** or 1 mL of the diluted solution into each cut.

With Frill or Girdle Method

Make a single girdle through the bark completely around the tree at a convenient height. Wet the cut surface with undiluted or diluted solution.

Both of the above methods may be used successfully at any season except during periods of heavy sap flow of certain species for example, maples.

Stump Treatment

Spray or paint the cut surfaces of freshly cut stumps and stubs with undiluted **TRYCERA®**. The cambium area next to the bark is the most vital area to wet.

STORAGE AND DISPOSAL

Do not contaminate water, food, or feed by storage and disposal. Open dumping is prohibited.

PESTICIDE STORAGE: Store above 28°F or agitate before use.

PESTICIDE DISPOSAL: Wastes resulting from the use of this product must be disposed of on site or at an approved waste disposal facility.

CONTAINER HANDLING:

NONREFILLABLE CONTAINER (EQUAL TO OR LESS THAN 5 GALLONS): Do not reuse or refill this container. Triple rinse container (or equivalent) promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container ¼ full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. Offer for recycling, if available. Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by other procedures approved by state and local authorities.

NONREFILLABLE CONTAINER (GREATER THAN 5 GALLONS): Do not reuse or refill this container. Triple rinse container (or equivalent) promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank. Fill the container ¼ full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Turn the container over onto its other end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Repeat this procedure two more times. Offer for recycling, if available. Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by other procedures approved by state and local authorities.

REFILLABLE CONTAINER: Refill this container with pesticide only. Do not reuse this container for any other purpose. Cleaning the container before final disposal is the responsibility of the person disposing of the container. Cleaning before refilling is the responsibility of the refiller. To clean the container before final disposal, empty the remaining contents from this container into application equipment or mix tank. Fill the container about 10 percent full with water. Agitate vigorously or recirculate water with the pump for 2 minutes. Pour or pump rinsate into application equipment or rinsate collection system. Repeat this rinsing procedure two more times. Seal all openings which have been opened during use. Return the empty container to a collection site designated by Helena Agri-Enterprises, LLC. If the container has been damaged and cannot be returned according to the recommended procedures, contact Helena Agri-Enterprises, LLC Customer Service Center at 1-800-258-1470 to obtain proper handling instructions.

Refer to label booklet for Directions for Use including Storage and Disposal.

Notice: Read the entire label. Use only according to label directions. Before using this product, read Warranty Disclaimer, Inherent Risks of Use, and Limitation of Remedies at end of label booklet. If terms are unacceptable, return at once unopened. In case of emergency endangering health or the environment involving this product, call 1-800-824-9300. If you wish to obtain additional product information, visit our web site at www.helenaagri.com.

Agricultural Chemical: Do not ship or store with food, feeds, drugs or clothing.

Terms and Conditions of Use

If terms of the following Warranty Disclaimer, Inherent Risks of Use, and Limitation of Remedies are not acceptable return unopened package at once to the seller for a full refund of purchase price paid.

Otherwise, use by the buyer or any other user constitutes acceptance of the terms under Warranty Disclaimer, Inherent Risks of Use and Limitations of Remedies.

Warranty Disclaimer

Helena Agri-Enterprises, LLC warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes stated on the label when used in strict accordance with the directions, subject to the inherent risks set forth below. To the extent consistent with applicable law, Helena Agri-Enterprises, LLC MAKES NO OTHER EXPRESS OR IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ANY OTHER EXPRESS OR IMPLIED WARRANTY.

Inherent Risks of Use

It is impossible to eliminate all risks associated with use of this product. Plant injury, lack of performance, or other unintended consequences may result because of such factors as use of the product contrary to label instructions (including conditions noted on the label, such as unfavorable temperature, soil conditions, etc.), abnormal conditions (such as excessive rainfall, drought, tornadoes, hurricanes), presence of other materials, the manner of application, or other factors, all of which are beyond the control of Helena Agri-Enterprises, LLC or the seller. All such risks shall be assumed by buyer.

CONDITIONS OF SALE-LIMITED WARRANTY AND LIMITATIONS OF LIABILITY AND REMEDIES

Read the Conditions of Sale-Warranty and Limitations of Liability and Remedies before using this product. If the terms are not acceptable, return the product, unopened, and the full purchase price will be refunded.

The directions on this label are believed to be reliable and must be followed carefully. Insufficient control of pests and/or injury to the crop to which the product is applied may result from the occurrence of extraordinary or unusual weather conditions or the failure to follow the label directions or good application practices, all of which are beyond the control of Helena Agri-Enterprises, LLC (the "Company") or seller. In addition, failure to follow label directions may cause injury to crops, animals, man or the environment. The Company warrants that this product conforms to the chemical description on the label and is reasonably fit for the purpose referred to in the directions for use subject to the factors noted above which are beyond the control of the Company. To the extent consistent with applicable law, the Company makes no other warranties or representations of any kind, express or implied, concerning the product, including no implied warranty of merchantability or fitness for any particular purpose, and no such warranty shall be implied by law.

The exclusive remedy against the Company for any cause of action relating to the handling or use of this product shall be limited to, at Helena Agri-Enterprises, LLC's election, one of the following:

1. Refund of the purchase price paid by buyer or user for product bought, or
2. Replacement of the product used

To the extent consistent with applicable law, the Company shall not be liable and any and all claims against the Company are waived for special, indirect, incidental, or consequential damages or expense of any nature, including, but not limited to, loss of profits or income. The Company and the seller offer this product and the buyer and user accept it, subject to the foregoing conditions of sale and limitation of warranty, liability and remedies.

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TRYCERA®, **HARDBALL®** and **OPTI-AMINE®** are registered trademarks of Helena Holding Company.

TORDON® and **RECLAIM®** are registered trademarks of Dow AgroSciences, LLC.

TRICLOPYR GROUP 4 HERBICIDE



TRYCERA®

For the control of woody plants and broadleaf weeds in ornamental turf (including sod farms, commercial turf and golf courses), forests, Christmas tree plantations and industrial non- crop areas, including manufacturing and storage sites.

For use in rights-of-way such as electrical power lines, communication lines, pipelines, roadsides, railroads, fence rows, non-irrigation ditch banks, and around farm buildings; including application to grazed areas, and establishment and maintenance of wildlife openings on these sites.

Use within production forests and industrial non-crop sites (including those listed above) may include applications to control target vegetation around standing water sites, such as marshes, wetlands, and the banks of ponds and lakes.

Aquatic Sites: For control of emerged, submersed and floating aquatic plants in aquatic sites such as ponds, lakes, reservoirs, non-irrigation canals, seasonal irrigation waters and ditches which have little or no continuous outflow, marshes and wetlands, including broadleaf and woody vegetation on banks and shores within or adjacent to these and other aquatic sites.

ACTIVE INGREDIENT:

Triclopyr: 3,5,6-trichloro-2-pyridinyloxyacetic acid 29.4%

OTHER INGREDIENTS 70.6%

TOTAL 100.0%

Triclopyr Acid equivalent: 2.87 lbs./gal.

KEEP OUT OF REACH OF CHILDREN DANGER / PELIGRO

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand the label, find someone to explain it to you in detail.)

First Aid

IF IN EYES: Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for treatment advice.

IF ON SKIN OR CLOTHING: Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice. **IF SWALLOWED:** Call a poison control center or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by a poison control center or doctor. Do not give anything by mouth to an unconscious person. Have the product container or label with you when calling a poison control center or doctor, or going for treatment. You may also contact 1-800-824-9300 for emergency medical treatment information.

Note to Applicator: Allergic skin reaction is not expected from exposure to spray mixtures of TRYCERA® herbicide when used as directed. **Note to Physician:** Probable mucosal damage may contraindicate the use of gastric lavage.

PRECAUTIONARY STATEMENTS

Hazards to Humans and Domestic Animals

DANGER. Corrosive. Causes irreversible eye damage. Harmful if swallowed or absorbed through skin. Prolonged or frequently repeated skin contact may cause allergic reaction in some individuals. Do not get in eyes or on skin or clothing. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco, or using the toilet. Remove and wash contaminated clothing before reuse.

STORAGE AND DISPOSAL

Do not contaminate water, food, or feed by storage and disposal. Open dumping is prohibited. **PESTICIDE STORAGE:** Store above 28°F or agitate before use.

PESTICIDE DISPOSAL: Wastes resulting from the use of this product must be disposed of on site or at an approved waste disposal facility. **CONTAINER HANDLING:**

NONREFILLABLE CONTAINER (EQUAL TO OR LESS THAN 5 GALLONS): Do not reuse or refill this container. Triple rinse container (or equivalent) promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container ¼ full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. Offer for recycling, if available. Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by other procedures approved by state and local authorities. **NONREFILLABLE CONTAINER (GREATER THAN 5 GALLONS):**

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SEE INSIDE PANEL FOR ADDITIONAL PRECAUTIONARY STATEMENTS

EPA Reg. No. 5905-580

AD 050420HAE

EPA Est. No.: First letters of product batch code indicate producing establishment.

5905-AR-1=WA • 5905-GA-1=CG • 5905-IA-1=DI • 5905-CA-1=KC



Manufactured For
HELENA AGRI-ENTERPRISES, LLC
225 SCHILLING BOULEVARD, SUITE 300
COLLIERVILLE, TENNESSEE 38017 U.S.A. • (901) 761-0050

NET CONTENTS:

PF 106958-3

PEEL BACK BOOK HERE AND RESEAL AFTER OPENING

OPM #127567