

# *Cabomba caroliniana* (Fanwort)

## Predicted Suitable Habitat Modeling

**Distribution Status:** Potential

**State Rank:** [SNA](#) (Aquatic Invasive Species)

**Global Rank:** [G5](#)

### Modeling Overview

**Data Source Last Updated:** Not Applicable

**Model Produced On:** October 29, 2021



### Deductive Modeling

#### **Modeling Process, Outputs, and Suggested Uses**

This is a simple rule-based model for aquatic invasive plants that have invaded Montana or have the potential to invade Montana using wetland and hydrographic features from National Wetland Inventory Mapping and the National Hydrography Dataset. The rules applied were as follows:

- Include modern National Wetland Inventory mapped wetland areas for:
  - Palustrine systems with Permanently Flooded or Intermittently Exposed water regimes
  - Lacustrine systems (Limnetic and Littoral) with Permanently Flooded or Intermittently Exposed water regimes
- Include National Hydrography Dataset features for:
  - Reservoirs, Lakes, Ponds, Rivers and large Streams
- Exclude the interior limnetic areas of Flathead Lake, Canyon Ferry Reservoir, and Fort Peck
- Exclude any features above 7000 ft (2135 m) in elevation

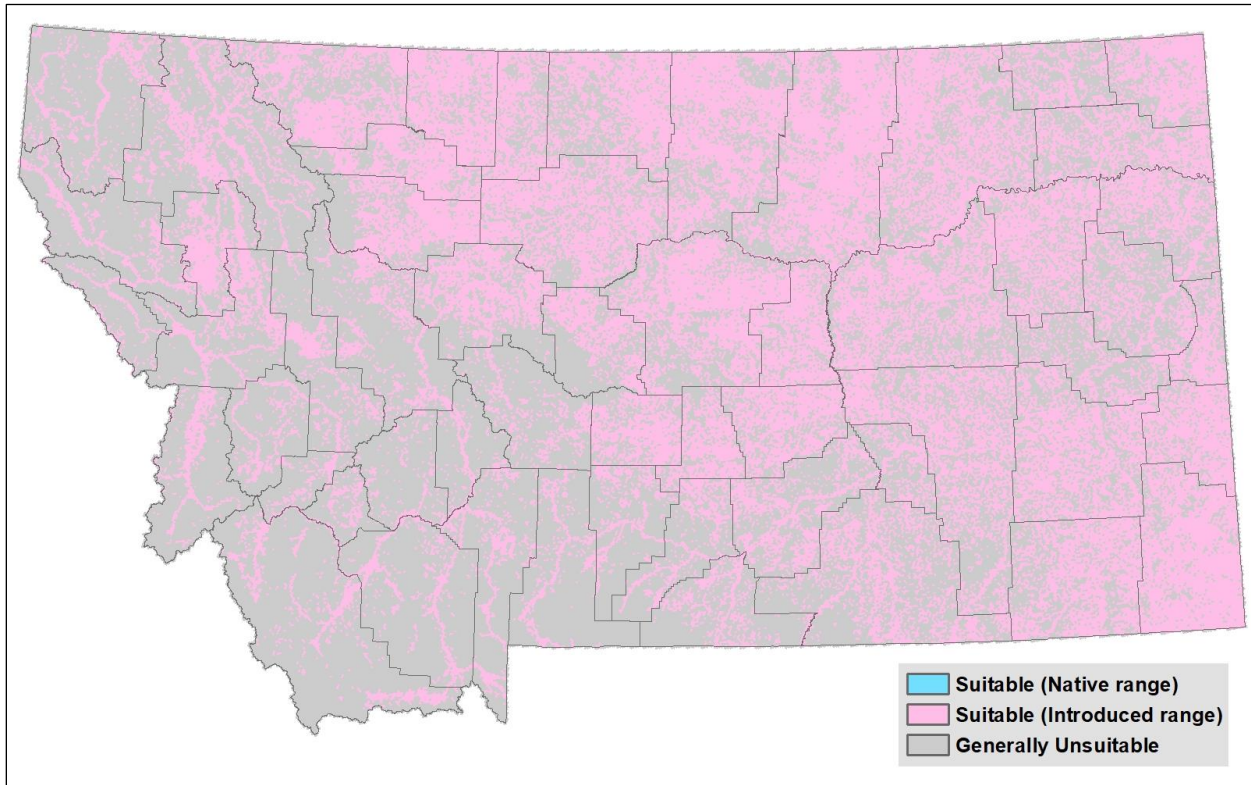
This underlying vector model is available up request. However, for compatibility with other predictive distribution models the Montana Natural Heritage Program produces, we have intersected these features with a uniform grid of hexagons that have been used for planning efforts across the western United States (e.g. Western Association of Fish and Wildlife Agencies - [Crucial Habitat Assessment Tool](#)). Each hexagon is one square mile in area and approximately one kilometer in length on each side. Any hexagon that intersected a wetland or hydrographic feature described above was classified as suitable habitat. Model outputs are not evaluated and we suggest they be used to generate potential lists of species that may occupy lands within each hexagon for the purposes of landscape-level planning. Model outputs should not be used in place of on-the-ground surveys for species and wildlife and land management agency biologists should be consulted about the value of using model output to guide habitat management decisions for regional planning efforts or local projects. See [Suggested Contacts for State and Federal Natural Resource Agencies](#) attached to this document.

**Suggested Citation:** Montana Natural Heritage Program. 2021. *Cabomba caroliniana* (Fanwort) predicted suitable habitat models developed on October 29, 2021. Montana Natural Heritage Program, Helena, MT. 5 pp.

**Montana Field Guide Species Account:** <http://fieldguide.mt.gov/speciesDetail.aspx?elcode=PDCAB02010>

## Deductive Model Map Output

Figure 1. Deductive habitat suitability model summarized into hexagons at a scale of 259 hectares per hexagon.

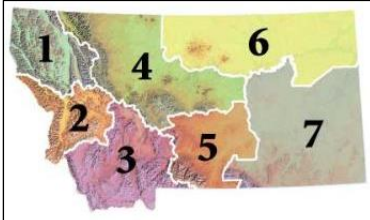


### Suggested Contacts for Natural Resource Management Agencies

As required by Montana statute ([MCA 90-15](#)), the Montana Natural Heritage Program works with state, federal, tribal, nongovernmental organizations, and private partners to ensure that the latest animal and plant distribution and status information is incorporated into our databases so that it can be used to inform a variety of permitting and planning processes and management decisions. We encourage you to contact state, federal, and tribal resource management agencies in the area where your project is located and review the permitting overviews by the [Montana Department of Environmental Quality](#), the [Montana Department of Natural Resources and Conservation](#) and the [Index of Environmental Permits for Montana](#) for guidelines relevant to your efforts. In particular, we encourage you to contact the Montana Department of Fish, Wildlife, and Parks for the latest data and management information regarding hunted and high-profile management species and to use the U.S. Fish and Wildlife Service’s [Information Planning and Consultation \(IPAC\) website](#) regarding U.S. Endangered Species Act listed Threatened, Endangered, or Candidate species.

For your convenience, we have compiled a list of relevant agency contacts and links below; check [our website](#) for updates.

#### Montana Fish, Wildlife, and Parks

Fish Species	Zachary Shattuck <a href="mailto:zshattuck@mt.gov">zshattuck@mt.gov</a> (406) 444-1231 or Eric Roberts <a href="mailto:eroberts@mt.gov">eroberts@mt.gov</a> (406) 444-5334
American Bison Black-footed Ferret Black-tailed Prairie Dog Bald Eagle Golden Eagle Common Loon Least Tern Piping Plover Whooping Crane	Kristina Smucker <a href="mailto:kismucker@mt.gov">kismucker@mt.gov</a> (406) 444-5209
Grizzly Bear Greater Sage Grouse Trumpeter Swan Big Game Upland Game Birds Furbearers	Brian Wakeling <a href="mailto:Brian.Wakeling@mt.gov">Brian.Wakeling@mt.gov</a> (406) 444-3940
Managed Terrestrial Game and Nongame Animal Data	Smith Wells – MFWP Data Analyst <a href="mailto:smith.wells@mt.gov">smith.wells@mt.gov</a> (406) 444-3759
Fisheries Data	Ryan Alger – MFWP Data Analyst <a href="mailto:ryan.alger@mt.gov">ryan.alger@mt.gov</a> (406) 444-5365
Wildlife and Fisheries Scientific Collector’s Permits	<a href="https://fwp.mt.gov/buyandapply/commercialwildlifeandscientificpermits/scientific">https://fwp.mt.gov/buyandapply/commercialwildlifeandscientificpermits/scientific</a> Kammi McClain for Wildlife <a href="mailto:Kammi.McClain@mt.gov">Kammi.McClain@mt.gov</a> (406) 444-2612 Kim Wedde for Fisheries <a href="mailto:kim.wedde@mt.gov">kim.wedde@mt.gov</a> (406) 444-5594
Fish and Wildlife Recommendations for Subdivision Development	Charlie Sperry <a href="mailto:CSperry@mt.gov">CSperry@mt.gov</a> (406) 444-3888 See also: <a href="https://fwp.mt.gov/conservation/living-with-wildlife/subdivision-recommendations">https://fwp.mt.gov/conservation/living-with-wildlife/subdivision-recommendations</a>
Regional Contacts 	<p><a href="#">Region 1</a> - Kalispell (406) 752-5501 <a href="mailto:fwprg12@mt.gov">fwprg12@mt.gov</a></p> <p><a href="#">Region 2</a> - Missoula (406) 542-5500 <a href="mailto:fwprg22@mt.gov">fwprg22@mt.gov</a></p> <p><a href="#">Region 3</a> - Bozeman (406) 577-7900 <a href="mailto:fwprg3@mt.gov">fwprg3@mt.gov</a></p> <p><a href="#">Region 4</a> - Great Falls (406) 454-5840 <a href="mailto:fwprg42@mt.gov">fwprg42@mt.gov</a></p> <p><a href="#">Region 5</a> - Billings (406) 247-2940 <a href="mailto:fwprg52@mt.gov">fwprg52@mt.gov</a></p> <p><a href="#">Region 6</a> - Glasgow (406) 228-3700 <a href="mailto:fwprg62@mt.gov">fwprg62@mt.gov</a></p> <p><a href="#">Region 7</a> - Miles City (406) 234-0900 <a href="mailto:fwprg72@mt.gov">fwprg72@mt.gov</a></p>

**Montana Department of Agriculture**

General Contact Information: <https://agr.mt.gov/About/Office-Locations/Office-Locations-and-Field-Offices>  
 Noxious Weeds: <https://agr.mt.gov/Noxious-Weeds>

**Montana Department of Environmental Quality**

Permitting and Operator Assistance for all Environmental Permits: <https://deq.mt.gov/Permitting>


**Montana Department of Natural Resources and Conservation**

Overview of, and contacts for, licenses and permits for state lands, water, and forested lands: <http://dnrc.mt.gov/licenses-and-permits>

Stream Permitting (310 permits) and an overview of various water and stream related permits (e.g., Stream Protection Act 124, Federal Clean Water Act 404, Federal Rivers and Harbors Act Section 10, Short-term Water Quality Standard for Turbidity 318 Authorization, etc.). <http://dnrc.mt.gov/divisions/carodd/conservation-districts/the-310-law>

Flood and Fire Resources: <http://dnrc.mt.gov/flood-and-fire>

**Bureau of Land Management**

Montana Field Office Contacts:																			
	<table> <tr><td>Billings</td><td>(406) 896-5013</td></tr> <tr><td>Butte</td><td>(406) 533-7600</td></tr> <tr><td>Dillon</td><td>(406) 683-8000</td></tr> <tr><td>Glasgow</td><td>(406) 228-3750</td></tr> <tr><td>Havre</td><td>(406) 262-2820</td></tr> <tr><td>Lewistown</td><td>(406) 538-1900</td></tr> <tr><td>Malta</td><td>(406) 654-5100</td></tr> <tr><td>Miles City</td><td>(406) 233-2800</td></tr> <tr><td>Missoula</td><td>(406) 329-3914</td></tr> </table>	Billings	(406) 896-5013	Butte	(406) 533-7600	Dillon	(406) 683-8000	Glasgow	(406) 228-3750	Havre	(406) 262-2820	Lewistown	(406) 538-1900	Malta	(406) 654-5100	Miles City	(406) 233-2800	Missoula	(406) 329-3914
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**United States Army Corps of Engineers**

Montana Regulatory Office for federal permits related to construction in water and wetlands  
 (406) 441-1375 <https://www.nwo.usace.army.mil/Missions/Regulatory-Program/Montana/>

**United States Environmental Protection Agency**

Environmental information, notices, permitting, and contacts <https://www.epa.gov/mt>  
 Gateway to state resource locators <https://www.envcap.org/srl/index.php>

**United States Fish and Wildlife Service**

Information Planning and Conservation (IPAC) website: <https://ecos.fws.gov/ipac/>  
 Montana Ecological Services Field Office (406) 449-5225 <https://www.fws.gov/montanafieldoffice/>

**United States Forest Service**

<b>Regional Office Contacts – Missoula</b>			
Wildlife Program Leader	Tammy Fletcher	<a href="mailto:tammy.fletcher2@usda.gov">tammy.fletcher2@usda.gov</a>	(406) 329-3086
Wildlife Ecologist	Cara Staab	<a href="mailto:cara.staab@usda.gov">cara.staab@usda.gov</a>	(406) 329-3677
Fish Program Leader	Scott Spaulding	<a href="mailto:scott.spaulding@usda.gov">scott.spaulding@usda.gov</a>	(406) 329-3287
Fish Ecologist	Cameron Thomas	<a href="mailto:cameron.thomas@usda.gov">cameron.thomas@usda.gov</a>	(406) 329-3087
TES Program	Lydia Allen	<a href="mailto:lydia.allen@usda.gov">lydia.allen@usda.gov</a>	(406) 329-3558
Interagency Grizzly Bear Coordinator	Scott Jackson	<a href="mailto:scott.jackson@usda.gov">scott.jackson@usda.gov</a>	(406) 329-3664
Acting Regional Botanist	Amanda Hendrix	<a href="mailto:amanda.hendrix@usda.gov">amanda.hendrix@usda.gov</a>	(651) 447-3016
Regional Vegetation Ecologist	Mary Manning	<a href="mailto:marry.manning@usda.gov">marry.manning@usda.gov</a>	(406) 329-3304
Invasive Species Program Manager	Michelle Cox	<a href="mailto:michelle.cox2@usda.gov">michelle.cox2@usda.gov</a>	(406) 329-3669

**Tribal Nations**



- [Assiniboine & Gros Ventre Tribes – Fort Belknap Reservation](#)
- [Assiniboine & Sioux Tribes – Fort Peck Reservation](#)
- [Blackfoot Tribe - Blackfoot Reservation](#)
- [Chippewa Creek Tribe - Rocky Boy's Reservation](#)
- [Crow Tribe – Crow Reservation](#)
- [Little Shell Chippewa Tribe](#)
- [Northern Cheyenne Tribe – Northern Cheyenne Reservation](#)
- [Salish & Kootenai Tribes - Flathead Reservation](#)

**Natural Heritage Programs and Conservation Data Centres in Surrounding States and Provinces**

- [Alberta Conservation Information Management System](#)
- [British Columbia Conservation Data Centre](#)
- [Idaho Natural Heritage Program](#)
- [North Dakota Natural Heritage Program](#)
- [Saskatchewan Conservation Data Centre](#)
- [South Dakota Natural Heritage Program](#)
- [Wyoming Natural Diversity Database](#)

**Invasive Species Management Contacts and Information**

Aquatic Invasive Species

- [Montana Fish, Wildlife, and Parks Aquatic Invasive Species staff](#)
- [Montana Department of Natural Resources and Conservation's Aquatic Invasive Species Grant Program](#)
- [Montana Invasive Species Council \(MISC\)](#)
- [Upper Columbia Conservation Commission \(UC3\)](#)

Noxious Weeds

- [Montana Weed Control Association Contacts Webpage](#)
- [Montana Biological Weed Control Coordination Project](#)
- [Montana Department of Agriculture - Noxious Weeds](#)
- [Montana Weed Control Association](#)
- [Montana Fish, Wildlife, and Parks - Noxious Weeds](#)
- [Montana State University Integrated Pest Management Extension](#)
- [Integrated Noxious Weed Management after Wildfires](#)
- [Fire Management and Invasive Plants](#)