

Noxious Weed Control Plan

For The
Gibson Dam Hydroelectric Project
FERC No. 12478-002

Dated
January 26, 2009

In Appendix B of its 10-Jul-2008 letter to the applicant, FERC requests a Vegetation Survey and Noxious Weed Control Plan. FERC guidance for the Plan reads as follows:

(1) Vegetation Survey and Noxious Weed Control Plan.
The U.S. Forest Service (Forest Service) recommended that you conduct a sensitive plant species survey in any areas where ground disturbing activities may occur (letter from Michael Munoz, Forest Service District Ranger to Steven Marmon, Gibson Dam Hydroelectric Company, March 9, 2007). The Forest Service also recommended that all areas planned for disturbance and the general transmission corridor be surveyed prior to construction for noxious weeds and invasive species. You proposed to conduct a sensitive plant survey prior to construction to determine species occurrence in finally-selected construction areas and to develop a noxious weed control plan prior to construction. You do not explain why you have not conducted studies.

Your APEA does not adequately describe existing vegetation in the project area and transmission line corridor. Based on the information in the APEA, we find that the results of botanical surveys of the project area are needed in order for staff to assess the effects of construction, maintenance, and operation of the proposed project on vegetation, including noxious weeds, Forest Service sensitive species, and State of Montana species of concern. Therefore, please file with your application, the results of botanical surveys, conducted after consulting with the U.S. Fish and Wildlife Service (FWS), Montana Department of Fish, Wildlife, and Parks (Montana DFWP), Forest Service, and U.S. Bureau of Reclamation (Reclamation), of the powerhouse area and the transmission line right-of-way. The timing of the surveys should be such to best ensure the identification of the Forest Service sensitive and state species of concern. Include in your filing detailed drawings showing the areas surveyed, estimates of the acreage of each major vegetative cover type, and total acreage of vegetation that would be removed or disturbed from project construction.

If the surveys locate Forest Service sensitive species or state species of concern, provide a description of the effects that project construction, operation, and maintenance would have on

these resources, a description of any measures you proposed to avoid or mitigate those effects, and the costs of any avoidance or mitigative measures.

Also please include in your license application a detailed noxious weed and invasive species control plan that would be implemented both during construction and operation of the project over the life of the license. The plan should include, at a minimum, the species targeted based in part on the results of the on-site surveys required above, and specific measures you would implement to control or eliminate noxious weed and invasive species. Include the costs for implementing the proposed measures.

Provide FWS, Montana DFWP, Forest Service, and Reclamation with your proposed response to this item, and allow the agencies 30 days in which to review and comment on the information. Your filing with the Commission should include copies of all responses received from the consulted agencies and an explanation of how you addressed any comments and recommendations. If the agencies do not reply, provide dated copies of your letters requesting consultation.

Introduction

A Special Status Plan and Noxious Weed Survey Report and Construction Plan Recommendations (Report) was prepared by Ecosystem Sciences dated September 30, 2008, for the Gibson Dam Hydroelectric Project (Project). Included in the Report, was a section titled "Noxious Weed Construction Recommendations". For ease of reference, the section relating to the control of noxious weeds has been extracted from the Report and included in this Noxious Weed Control Plan (Plan). This Plan has been updated to incorporate comments received from responding agencies on the initial Report prepared by Ecosystem Sciences.

General

Legally, a noxious weed is any plant designated by a federal, state or county government as injurious to public health, agriculture, recreation, wildlife or property (Sheley et al.1999). Once established, noxious weeds aggressively out-compete desirable native plants for vital resources (moisture, nutrients, space, and sunlight). Without weed management programs, noxious weeds can degrade the local ecosystem by replacing native vegetation communities with annual plant communities, and altering the fire ecology.

Established weed populations damage the ecosystem by forming monocultures that eliminate diverse native communities, increase soil erosion, diminish native forage production and cover for herbivores, and alter natural fire regimes. Additionally, invasive and noxious weeds reduce opportunities for hunting, fishing, camping and other recreational activities; displace many threatened, endangered or sensitive species; reduce plant and animal diversity because of weed monocultures-single plant species that over run other species in an area; disrupt waterfowl and neo-tropical migratory bird flight

patterns and nesting habitats; and cost millions of dollars in treatment and loss of productivity to private land owners (BLM – weed website).

Noxious weeds were observed in the project area, most often in disturbed areas and proposed construction zones (e.g. roads and staging areas for powerhouse). The disturbance from the construction could introduce new noxious weed species or exacerbate the spread of existing populations. It is particularly important to note that much of the area where construction may occur is adjacent to pasture and agricultural lands that are already disturbed from grazing and agricultural land use practices. Disturbed pastures and barren, fallow agricultural fields will provide abundant habitat for spreading noxious weed populations. Thus, it is necessary to implement noxious weed management strategies throughout the proposed construction process.

Elements of Prevention

The elements of prevention include:

- Limit the introduction of weed seeds into an area.
- Early detection and eradication of small patches of weeds.
- Minimize disturbance of desirable vegetation along roadsides, trails, and waterways.
- Manage land to build and maintain healthy communities of native and desirable plants to compete with weeds.
- Careful monitoring of high-risk areas such as human and animal transportation corridors and disturbed or bare ground.
- Re-vegetate disturbed sites with desirable plants.
- Annual evaluations of the effectiveness of the prevention plan so appropriate adaptations can be implemented the following year.

The spread of invasive and noxious weeds is a significant issue in construction projects that involve land disturbance. Measures must be taken to prevent the spread of noxious and invasive weeds during proposed construction activities. Earth moving activities and the use of contaminated construction fill, seed, or erosion-control products contribute to the spread of weeds. Prevention is the least expensive and most effective way to halt the spread of noxious and invasive weeds.

Best Management Practices

The following four lists include suggested best management practices pertaining to construction (prior to, during, after, and floating or submersible equipment) activities aimed at limiting the spread of noxious weeds. Many of these practices should be employed during and after the construction phase of the proposed Project.

Prior to any construction activities:

- Identify and map all noxious and invasive weed populations present in the Project area. (noxious and invasive weeds found in the Project area are included in APPENDIX B)

- Treat or contain any weed populations that may be impacted or disturbed by construction activity.
- Flag all weed populations to be avoided.
- Provide training to construction workers and equipment operators on the identification of weeds to be avoided.
- Certify that all construction material sources used for supplies of sand, gravel, rock and mulch are weed-free prior to obtaining or transporting any material from them.
- Obtain and use only certified weed-free straw or use fiber roll logs for sediment control.
- Clean all equipment of dirt and vegetative matter, and inspect all equipment; i.e, cars, transporting trailers and trucks, and recreational equipment, before bringing on-site, prior to leaving paved roads. The Contractor shall pressure wash all said construction equipment prior to demobilizing from the Project.

During construction:

- Minimize ground disturbance and vegetation removal as much as possible and practical.
- Wash (power or high pressure wash), or using an air compressor, blow clean all vehicles (including tires and undercarriage) before leaving weed-infested areas.
- Restrict vehicles or other traffic that may transport weed seeds or plant material from entering the job site unless they are first washed and inspected.
- Strip and dispose of weed infested soils in a class II landfill. Alternatively, weed seed infested soils could be used for fill if the site is to be covered with impenetrable material (e.g. a concrete floor); treated with ground sterilant (e.g. a switchyard); or buried more than 5-ft deep.
- To improve revegetation success, strip and stockpile topsoil for future use, unless it is infested with weeds.

Floating or submersible equipment (any equipment, including recreational, to be used in water must follow precautions to avoid the introduction of aquatic invasive species).

Prior to arriving on-site:

- Remove all plants or animals or fragments of plant or animals.
- Drain all water from motors, pumps, bilges or other containers. If the equipment has been drained for less than 7 days prior to arrival on-site, a chemical or hot water treatment sufficient to kill these organisms shall be utilized.
- Inspect visually and tactily to detect any presence of invasive species (e.g. zebra mussels, hydrilla, and Eurasian milfoil).
- Equipment to be cleaned and inspected includes transporting trailers and trucks.

After construction is complete:

- Re-vegetate or otherwise prevent the establishment of weeds in the project by and documenting all ground-disturbing operations in noxious weed infested areas for at least three growing seasons. For ongoing projects, continue to monitor until reasonable certain that no weeds have appeared.

- Revegetation may include topsoil replacement, planting, seeding, fertilization, liming, and weed-free mulching as necessary.
- Re-vegetate using soil components obtained from non-weed infested sources.
- Utilize seed and other plant materials that have been checked and certified as noxious weed-free and that have a weed content of 0.05% or less. Use native material where appropriate and feasible.
- Re-vegetate using plant materials that have a high likelihood of survival.
- Treat all weeds adjacent to newly seeded areas prior to planting and treat planted areas for weeds in the first growing season.
- Communicate with local weed districts, resource agencies, and management areas, annually, regarding projects and best management practices for prevention.

Cost

The cost for noxious weed prevention, including equipment and labor to wash and inspect construction equipment is estimated at \$10,000 assuming a 12 month construction duration period.

References

Center for Invasive Plant Management. 2002/2007. *Invasive Plant Management: CIPM Online Textbook*. Bozeman, MT: Center for Invasive Plant Management.
<http://www.weedcenter.org/textbook/toc.html>

Ecosystem Sciences. 2008. *Special Status Plant and Noxious Weed Survey Report and Construction Plan Recommendations*. Produced for Gibson Dam Hydroelectric Company, LLC for the proposed Gibson Dam Hydroelectric Project (FERC No. 12478-002).

United States Department of Agriculture, Forest Service. 2001. Guide to Noxious Weed Prevention Practices. Version 1.0.
http://www.fe.fed.us/rangelands/ftp/invasives/documents/GuidetoNoxWeedPrevPractices_07052001.pdf

Agency Consultation

A copy of the Special Status Plant and Noxious Weed Survey Report and Construction Plan Recommendations report was initially distributed for review and comment via email on **October 23, 2008** to the following State and Federal resource agencies listed below:

Mr. Steve Davies
 Montana Area Office
 U.S. Bureau of Reclamation
 P.O. Box 30137
 Billings, MT 59107-0137
sdavies@gp.usbr.gov

Ms. Laura Conway
USDA Forest Service
Lewis & Clark National Forest
P.O. Box 869
Great Falls, MT 59403-0869
lconway@fs.fed.us

Mr. Glenn Phillips
Habitat Protection Bureau Chief
Montana Department of Fish, Wildlife & Parks
1420 6th Avenue East
Helena, MT 59620-0701
gphillips@mt.gov

Mr. Mike Philbin
Bureau of Land Management
5001 Southgate Dr.
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mphilbin@blm.gov

Mr. Mark Wilson
U.S. Fish & Wildlife Service
100 North Park Avenue
Suite 320
Helena, MT 59106
Mark_wilson@fws.gov

Mr. Erik Eneboe
State of Montana
Department of Natural Resources and Conservation
P.O. Box 961
Conrad, MT 59425
eneboe@mt.gov

Comments on the Report were received from:

USDOI Bureau of Reclamation	Letter dated November 24, 2008
USDA Forest Service	Letter dated November 26, 2008

Comments on the Report from responding Agencies are included in **Appendix A**. A summary of the Agency comments and the Applicant's response to each as incorporated into the final Plan, follows:

ID	Agency Comment	Applicant Response
BOR1	Suggest all equipment must be cleaned to remove all dirt and vegetative matter from all equipment, and inspected, prior to being brought on-site. The contractor shall also pressure wash all said construction equipment prior to demobilizing from the Project.	Added additional wording as suggested in “Prior to Construction” paragraph.
BOR2	Suggest to strip, remove and dispose of weed infested soils in a class II landfill, under impenetrable material, treated with ground sterilent, or buried more than 5-ft deep.	Added additional wording as suggested in “During Construction” paragraph.
BOR3	Suggest to strip and stockpile topsoil for future use to improve revegetation success, unless it is infested with weeds.	Added additional wording as suggested in “During construction” paragraph.
BOR4	Suggest adding paragraph for “Floating or submersible equipment”.	Added additional paragraph as suggested under Best Management Practices section.
BOR5	Suggest removing all plants or animals or fragments of plants or animals from floating or submersible equipment.	Added additional wording as suggested.
BOR6	Suggest draining all water from motors, pumps, bilges or other containers from floating or submersible equipment. Use chemical or hot water if drained less than 7 days prior to arrival on-site.	Added additional wording as suggested.
BOR7	Suggest inspecting floating or submersible equipment visually and tactily to detect any presence of invasive species (e.g. zebra mussels, hydrilla, and Eurasian milfoil)	Added additional wording as suggested.
BOR8	Suggest floating or submersible equipment to be cleaned and inspected includes transporting trailers and trucks.	Added additional wording as suggested.
USFS1	No comment on Noxious Weed Plan or Construction Plan Recommendations. Suggest informing USFS if the rattlesnake plantain is located in the Project area at a later date.	Applicant agrees to notify USFS if the rattlesnake plantain is located in the Project area at a later date.

Appendix A

Agency Consultation

October 23, 2008

Ms Laura Conway
US Department of Agriculture,
Forest Service
lconway@fs.fed.us

Mr. Mike Philbin
Bureau of Land Management
mphilbin@blm.gov

Mr. Steve Davies
U.S. Bureau of Reclamation,
Great Plains Region
sdavies@gp.usbr.gov

Mr. Mark Wilson
U.S. Fish & Wildlife Service
mark_wilson@FWS.gov

Mr. Glenn Phillips
Montana Fish, Wildlife & Parks
gphillips@mt.gov

Mr. Erik Eneboe
State of Montana, DNRC
eneboe@mt.gov

REF: Gibson Dam Hydroelectric Project, FERC No. 12478-002
SUB: Electronic Distribution of Special Status Plant & Noxious Weed Survey Report and Construction Plan Recommendations, and Request for Comments.

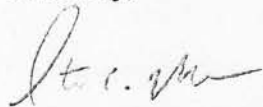
Dear Agency Lead:

Attached is a copy of the Special Status Plant & Noxious Weed Survey Report and Construction Plan Recommendations for the above referenced project. Please review the report and provide written comments, if any, within 30 days of the date of this letter. Your comments should be faxed, mailed or emailed to:

Gibson Dam Hydroelectric Company, LLC
Attn. Steve Marmon, Project Manager
3633 Alderwood Ave.
Bellingham, WA 98225
(360)733-3056 FAX
smarmon@whitewatereng.com EMAIL

Please contact me at (360)738-9999 or smarmon@whitewatereng.com should you have any questions. Thank you for your continued participation in the licensing process.

Sincerely,



Steven C. Marmon
Project Manager

GIBSON DAM HYDROELECTRIC COMPANY, LLC

3633 Alderwood Ave., Bellingham, WA 98225

(360)738-9999 ph (360)733-3056 fax

www.gibsonhydro.com



United States Department of the Interior

BUREAU OF RECLAMATION

Great Plains Region

P.O. Box 36900

Billings, Montana 59107-6900



IN REPLY REFER TO:

GP-2200

PRJ-18.00

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Gibson Dam Hydroelectric Company, LLC

Attention: Steven Marmon

3633 Alderwood Avenue

Bellingham, WA 98225

Subject: Review Comments, Special Status Plant & Noxious Weed Survey Report and Construction Plan Recommendations, Gibson Dam Hydroelectric Project, FERC No. 12478-002, Montana

Dear Mr. Marmon:

The Bureau of Reclamation has received and reviewed the subject report and recommendations, and the following are our review comments concerning the construction plan recommendations:

Prior to Construction

BOR1

All equipment must be cleaned to remove all dirt and vegetative matter, and inspected, prior to being brought on-site. It is recommended the inspection take place prior to leaving paved roads. Equipment to be cleaned and inspected includes all equipment; i.e., cars, transporting trailers and trucks, and recreational equipment brought on-site. The Contractor shall also pressure wash all said construction equipment prior to demobilizing from this project.

During Construction

BOR2

Strip, remove and dispose of weed infested soils in a class II landfill. Alternatively, weed seed infested soils could be used for fill if the site is to be covered with impenetrable material (e.g. a concrete floor); treated with ground sterilant (e.g. a switchyard); or buried more than 5 feet deep.

BOR3

To improve revegetation success, strip and stockpile topsoil for future use, unless it is infested with weeds.

BOR4

Floating or submersible equipment (any equipment, including recreational, to be used in water must follow precautions to avoid the introduction of aquatic invasive species):

BOR5

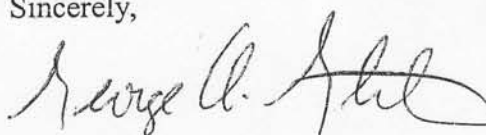
Prior to arriving on-site:

1. Remove all plants or animals or fragments of plants or animals.

- BOR 6
2. Drain all water from motors, pumps, bilges or other containers. If this equipment has been drained for less than 7 days prior to arrival on-site, a chemical or hot water treatment sufficient to kill these organisms shall be utilized.
- BOR 7
3. Inspect visually and tactily to detect any presence of invasive species (e.g. zebra mussels, hydrilla, and Eurasian milfoil).
- BOR 8
4. Equipment to be cleaned and inspected includes transporting trailers and trucks.

If you have any questions, please contact me at 406-247-7651.

Sincerely,



George A. Gliko
Regional FERC Coordinator

cc: Mr. Bob Hardin, Manager
Greenfields Irrigation District
P.O. Box 157
Fairfield, MT 59436



United States
Department of
Agriculture

Forest
Service

Lewis and Clark
National Forest

1101 15th Street North
P.O. Box 869
Great Falls, MT 59403-0869
406 791-7700
FAX 406 731-5302

File Code: 2720

Date: November 26, 2008

Steve Marmon
Project Manager
Gibson Dam Hydroelectric Company, LLC
3633 Alderwood Avenue
Bellingham, WA 98225

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Dear Mr. Marmon:

This letter is in response to your request for comments on the Gibson Dam Hydroelectric Project, FERC No. 12478-002, 1) Draft Recreation Plan, 2) Special Status Plant and Noxious Weed Survey Report and Construction Plan Recommendations, 3) Draft Post-Construction Water Quality Monitoring Plan, 4) Draft Construction Water Quality Monitoring Plan, and 5) Draft Bear Safety Plan. Attached you will find two documents with specific comments related to the Draft Recreation Plan and the Draft Bear Safety Plan.

As for the Special Status Plant and Noxious Weed Survey Report and Construction Plan Recommendations, our sensitive plant coordinator Tanya Murphy noted that rattlesnake plantain did not leaf out or flower until well into August in 2008. This plant could have been missed during your surveys. At this time we are not requesting additional surveys, however we would like to be informed if this plant is located in the project area at a later date.


USFS

In the Water Quality Monitoring Plans, it would be helpful if the sampling location map showed more detail, such as roads and Diversion Dam. Also, the composite graph of Dissolved Oxygen levels for the three year period is difficult to tease out the important data. We request that the data be displayed graphically for both yearly and a three year period.

The project area maps in your reports indicate the area around Gibson Reservoir owned by the Bureau of Reclamation. This is inaccurate. Attached you will find a map with the correct designation for these lands. The area is U.S. Forest Service land, withdrawn for reclamation purposes. The Bureau of Reclamation manages the area for the water uses and the dam. The Forest Service maintains ownership and continues to manage the recreational uses in the area.

If you have any questions regarding these comments please contact Laura Conway at 406-791-7739.

Sincerely,

for 
LESLEY W. THOMPSON
Forest Supervisor
Enclosures



Appendix B

Guide to Noxious Weed Identification

Spotted Knapweed

(*Centaurea maculosa*)



Flowering spotted knapweed

Spotted knapweed, a tap-rooted biennial to short-lived perennial, was introduced from Eurasia in contaminated alfalfa and clover seed. The basal rosettes of spotted knapweed have deeply lobed grayish-green leaves up to 6 inches long that radiate from a common center point. The stem leaves are finely divided into linear segments. One to many highly branched stems grow out of the rosette with heights ranging from 1 to 4 feet. One pinkish-purple flower head develops on the end of each branch of the stem, allowing individual highly branched plants to produce as many as 300 flower heads. The bracts, under the petals, have dark, fringed tips which appear as multiple spots and give this noxious weed its characteristic name (*maculosa* means spotted). Unlike yellow starthistle and diffuse knapweed, spines are not well developed on the bracts. The flowers produce black seeds about 1/8 inch long. Spotted knapweed has a deep taproot that is relatively easy to distinguish from the rhizomatous roots of Russian knapweed.

Field Bindweed

(*Convolvulus arvensis*)



Flowering field bindweed

Field bindweed is a member of the morning-glory family and shares the family's vine characteristics. The extensive root system and creeping growth habit of this perennial weed form dense tangled infestations. Stems are 1 to 4 feet long, growing horizontally along the ground or climbing. The dark green leaves, shaped like arrowheads with sharp pointed lobes, are alternate and grow on one side of the stem. Flowers are approximately 1 inch in diameter, tubular or bell-shaped, and white to pinkish in color. Two tiny bracts occur on the stem 1 inch below the flower base. Four seeds are produced in a small round fruit. Field bindweed was introduced from Europe and has become a problem in disturbed areas, pastures and cultivated fields - hence the Latin name *arvensis*, which means pertaining to fields.

Houndstongue (*Cynoglossum officinale*)



Houndstongue produces a flowering stem the second year.

Houndstongue is a biennial forb that forms a rosette in the first year of growth and produces a flowering stem the second year. The rosette is comprised of large (up to 12 inches long), velvety leaves that lack teeth or lobes and are rough to the touch (resembling a hound's tongue). The flowering stem grows 1 to 4 feet in height, has alternate leaves that get smaller higher on the stem, and branches near the apex. The terminal branches are where the flowers develop. As the plant matures, the terminal, scorpion tail-shaped portion of the branch unrolls and displays the flowers. The five petals of the flowers are reddish-purple and unite at the base. The seeds of each houndstongue flower consist of four bur-like adhesive nutlets about 1/3-inch long commonly referred to as "beggar's lice." Houndstongue, a native to Europe, contains a toxin that causes liver cells to stop reproducing



Houndstongue rosette
- produced in the first
year of growth.

Canada Thistle

(*Cirsium arvense*)



Flowering Canada thistle

Canada thistle was introduced from southeastern Eurasia as a contaminant of crop seed. It is a colony-forming perennial with an extensive horizontal and vertical root system. It can reproduce either vegetatively through the rhizomatous roots or from seed. Rosettes have spine-tipped wavy leaves. As the plant develops, the leaves become more lobed and the spines become more prominent. The stem leaves are alternate, lance-shaped, lobed and spine-tipped, and lack stalks. Upper stem leaves are smaller than lower stem-leaves. The stems are erect, ridged, 1 to 4 feet tall, often branched, slightly hairy, and lack spines. Flowers are usually purple (sometimes white) in heads 1/2 to 3/4-inch in diameter and form clusters at the ends of branches. Canada thistle is the only thistle in our region with male and female flowers on separate plants. Many bracts are present beneath the petals, but spines are absent or consist of weak prickles. The long, flattened seeds have tufts of white hairs at the top for dispersal.

Perennial Pepperweed

(*Lepidium latifolium*)



Flowering perennial
pepperweed

Perennial pepperweed, also called broad-leaved peppergrass or tall whitetop, is a perennial plant native to Eurasia. It is a deep-rooted forb that reproduces by seeds and spreading roots. Plants are typically 1 to 3 feet tall but can reach 6 feet. The bright-green to gray-green leaves are broad at the base and taper to a pointed tip. (The Latin name, *latifolium*, meaning broad-leaved, refers to this characteristic.) Basal leaves up to 13 inches long and 4 inches wide have long stalks and are covered with a waxy layer. Stem leaves, which are smaller and have smaller stalks than basal leaves, are alternately arranged on the stem. Perennial pepperweed is distinguished from whitetop by leaves that do not clasp the stem. All leaves have a prominent whitish midvein. Flowers are less than 1/8 inch wide and consist of four white petals arranged in a cross; they bloom from early summer to fall and are borne in dense, rounded clusters at the terminal part of branches. The fruit is a flat, rounded, slightly hairy 1/16-inch long reddish-brown capsule that contains two tiny seeds.

Weed Information

Common Mullein (*Verbascum thapsus L.*)

Growth Habit: Large biennial, 2 to 6 feet tall.

Leaves: Rosette produces fuzzy leaves the first year. Leaves are alternate, overlapping one another, light green, densely woolly.

Stem: Large woody stem 2 to 6 feet tall.

Flower: Flowers are sessile, borne in long terminal spikes, sulfur yellow, 5 - lobed and more than a 1 inch in diameter.



Hydrilla

(*Hydrilla verticillata*)



Leaves grow in whorls of four to eight around the stem.

Hydrilla is a submerged aquatic perennial plant with ascending stems which become horizontal and heavily branched near the water surface. The narrow leaves are 1-2 cm long, sessile and whorled in groups of 4-8 but sometimes may be opposite on the lower stems. The blades have a row of teeth along the margin and on the underside of the leaf along the midvein. The small flowers are of one sex and these are usually found on separate plants. Hydrilla grows very rapidly from rootstocks, vegetative buds, and vegetative nodes. Only one node is necessary for growth. In clear water the plant can grow in depths of more than 40 feet. When growing from the bottom the leaves may be up to, or more than, 6 inches apart.

Eurasian Water Milfoil

(*Myriophyllum spicatum*)



This aquatic plant forms dense floating mats of vegetation.

Three to four leaves are whorled around the stem.



Eurasian water milfoil is a submerged herbaceous perennial herb native to Europe, Asia, and northern Africa. It was accidentally introduced to the United States in the late 1800s, probably as an escaped aquarium species or from a boat. Eurasian water milfoil has numerous roots at the base of the plant and along the length of the stem. Stems can be 10 feet or more in length and 0.1 inch thick. Stems grow to the water surface, where they branch and form dense floating mats of vegetation. The long, slender hairless stems are leafless toward the base and whitish when dry. Three to four bright green leaves are whorled around the stem at each joint. Each leaf is 1.2 inches long and has 12 to 48 thread-like divisions. (The Latin name, *Myriophyllum*, meaning many-leaved, refers to these finely dissected feather-like leaves.) Leaves rarely extend above the water surface and become matted when they are removed from water. A rigid pink flowering-spike, form 2 to 8 inches long, is held erect above the water surface from June to August. Small yellow four-petaled flowers are arranged in clusters on the flowering spike. The fruit is a hard, segmented capsule containing four seeds. Seeds are not an important means of spread. Asexual reproduction via sprouting plant fragments and rhizomes is the dominant means of spread.



Zebra Mussels on a stick

The [Zebra Mussel](#) looks like a small clam with a D-shaped shell. Usually it has alternating dark and light stripes, is the size of a fingernail, is found attached to hard surfaces in clusters and young zebra mussels look like black pepper and feel like sandpaper when attached to a boat surface.