*Corbicula fluminea (*Asian Clam*)* Eradication and Lake Elmo Habitat and Access Improvement Project

Mike Ruggles Fisheries Manager, Bob Gibson Information Officer, Shannon Blackburn Fisheries Biologist, Terri Walters Parks Manager, Barb Beck Regional Manager, Thomas Woolf AIS Bureau Chief, Craig McLane AIS Specialist, Stacy Schmidt AIS Specialist
Montana Fish, Wildlife & Parks
Region 5
2300 Elmo Lake Drive
Billings, MT 59105
{406} 247-2961
fwpregion5pc@mt.gov

Executive Summary

Corbicula fluminea (Asian, golden or good luck clams), an aquatic invasive species (AIS), was discovered in Lake Elmo in 2019. This was the first discovery of *Corbicula fluminea* in Montana. Subsequent sampling in 2019 suggests that *Corbicula fluminea* are limited to Lake Elmo as no invasive clams were found in rivers and ditches or irrigation storage reservoirs upstream or downstream from Lake Elmo.

Corbicula fluminea are undesirable because they can clog irrigation and other water system infrastructure, filter and remove important food sources needed by other species and promote the growth of bacteria and algae. Furthermore, the shells of dead *Corbicula fluminea* are sharp and constitute a safety hazard for people using the lake.

Public scoping in March 2020 indicated strong support for Montana Fish, Wildlife and Parks (FWP) to take action to address the presence of *Corbicula fluminea* in Lake Elmo and take the opportunity to improve fisheries habitat, access and park amenities. Lake Elmo is the key feature of Lake Elmo State Park in Billings, which is very popular and receives high year-around use for a variety of activities.

Data show that drying and freezing is the most effective way to kill *Corbicula fluminea*. A partial and limited drawdown has been completed for the fall of 2020. There will be limited natural water loss over winter with refilling of the reservoir to occur in April 2021. This action will result in Lake Elmo going into winter nearly three feet lower than full pool, exposing some shoreline to the elements to reduce the population of clams that are found mostly near the water surface to a depth of six feet. Lake Elmo State Park and the remaining water will remain available to the public during the partial drawdown.

FWP is considering three alternatives to address Corbicula *fluminea* in Lake Elmo:

- **Alternative 1** is the no-action alternative. Under this alternative, existing management of the lake and state park would not change. There would be no further attempt to eradicate the clams and no efforts taken to make improvements to habitat or recreation opportunities.
- **Alternative 2** would manage access and use of Lake Elmo to restrict expansion of *Corbicula fluminea* beyond Lake Elmo but would not include a full drawdown of the lake.
- **Alternative 3** would result in a full drawdown of the lake to expose the entirety of the lakebed beginning in September 2021 with refilling starting in April of 2022.

Under Alternative 3, FWP also would consider plans to take advantage of the complete drawdown to implement several fisheries habitat and parks access projects that would be more easily implemented without water in the lake. The projects are dependent on funding and planning. Combining both fisheries and parks projects more cost-effective than if done separately. Public support and fund raising will be necessary to implement the projects.

Possible fisheries improvement projects, all independent from one another and dependent on funding and planning, could include parks programming and dispersed picnic nodes substrates for fish habitat, artificial and imported fisheries habitat structures, sediment retention and excavation and headgate improvements with fish screens.

Possible parks improvements, amenities and access all would be independent from one another and from any fisheries improvements – and would depend on funding and planning. They could include creating a boardwalk along Lake Elmo Drive over the water, adding between one and four fishing nodes along the length of the boardwalk, improving protections and access to the irrigation headgate, creating accessible jetty surfaces for visitors, creating an earthen program stage area, creating dispersed picnic table nodes, improving the dog park shoreline, and trail improvements.

The preferred alternative is **Alternative 3** – removal of *Corbicula fluminea* using a full drawdown in fall of 2021 followed by filling in spring of 2022. In addition, projects to improve fisheries habitat and park amenities and access would be completed, depending on funding and planning. This alternative allows FWP to most efficiently address present and future needs of the park, the resources,, and the public.

Table of Contents

Executive Summary 2

List of Tables 5

List of Figures 6

A. Background and Proposed Actions 6

Type of Proposed Action 6

Agency Authority for the Proposed Action 7

Project Name 7

Project Sponsor 7

Anticipated Schedule 7

Location of Project 8

Project Size 9

Consultation 10

Permits 10

Budget 10

Lake Elmo History Brief 11

Corbicula fluminea Summary 12

Fisheries Summary 14

Parks Summary 16

B. Alternatives 17

1. No Action 18

2. Mange Park and Lake Access to Control Invasive *Corbicula fluminea* 18

3. Drain, Dry, Freeze to Remove *Corbicula fluminea* Population and Implement

Fisheries and Park Projects 18
C. Alternative Analysis 18
1. No Action 18
2. Manage Park and Lake Access to Control Invasive *Corbicula fluminea* 19
3. Drain, Dry, Freeze to Remove *Corbicula fluminea* Population and Implement Fisheries and Park Projects 19
A. Jetties 21
B. Program Stage 22
C. Dispersed Picnic Areas 22
D. Artificial Habitat 22
E. Imported Habitat 23
F. Sediment Retention 24
G. Excavation 24
H. Boardwalk 24
a. Boardwalk with Nodes 24
I. Irrigation Headgate Protection 24
J. Dog Park Shoreline 25
K. Shoreline Erosion 25
L. Trail Improvements 25
D. ENVIRONMENTAL REVIEW 25
D.1 LAND RESOURCES 25
D.2 AIR 27
D.3 WATER 28
D.4 VEGETATION 29
D.5 FISH/WILDLIFE 30
D.6 HUMAN ENVIRONMENT NOISE/ELECTRICAL EFFECTS 34
D.7 LAND USE 34
D.8 RISK/HEALTH HAZARDS 35
D.9 COMMUNITY IMPACT 36
D.10 PUBLIC SERVICES/TAXES/UTILITIES 37
D.11 AESTHETICS/RECREATION 38
D.12 CULTURAL/HISTORICAL RESOURCES 39
E. SIGNIFICANCE CRITERIA 40
E.1 SUMMARY EVALUATION OF SIGNIFICANCE 40

E.2 Description and Analysis of Reasonable Alternatives 41
E.2.1 No action 41
E.2.2 Mange Park and Lake Access to Control Invasive *Corbicula fluminea* 42
E.2.3 Drain, Dry, Freeze to Remove *Corbicula fluminea* Population and Implement Fisheries and Park Projects 43
F. EVALUATION AND LISTING OF MITIGATION, STIPULATION OR OTHER CONTROL MEASURES ENFORCEABLE BY THE AGENCY OR OTHER GOVERNMENT AGENCY 44
G. NARRATIVE EVALUATION AND COMMENT 44
H. EA CONCLUSION SECTION 44
I. PRIVATE PROPERTY ASSESSMENT ACT CHECKLIST 47
J. Literature Cited: 48
K. Appendix 49
K.1 Irrigation Post Card 49
K.2 Wetland Inventory Map 49
J.2 Wetlands Inventory 50
K.3 Charts and Tables of Survey Results Public Scoping May 1 through May 17, 2020 51

List of Tables

Table 1. Timeline of proposed actions. 8
Table 2. Acres of land affected by the proposed project. 9
Table 3. Full Projected Budget. 10
Table 4. Physical Environment Land Resources. 25
Table 5. Physical Environment Air. 27
Table 6. Physical Environment Water. 28
Table 7. Physical Environment Vegetation. 29
Table 8. Physical Resource Fish and Wildlife. 31
Table 9. Human Environment Noise and Electrical Effects. 34
Table 10. Human Environment Land Use 34
Table 11. Human Environment Risk and Health Hazards. 35
Table 12. Human Environment Community Impact. 36
Table 13. Human Environment Public Services, Taxes, Utilities. 37
Table 14. Human Environment Aesthetics and Recreation. 38
Table 15. Human Environment Cultural and Historical Resources. 39
Table 16. Summary Evaluation of Significance. 40

List of Figures

Figure 1. Map of Lake Elmo State Park. 8
Figure 2. Lake Elmo Conceptual Plan Map. 9
Figure 3. Lake Elmo Corbicula fluminea 2019 sampling results. 13
Figure 4. Fish Stocking History of Lake Elmo. 14
Figure 5. Results from FWP Angler Mail Survey for Lake Elmo 1989–2017. 15
Figure 6. Lake Elmo Visitor Summary 2011–2018. 17
Figure 7. Miles City Spotted Eagle Pond Jetty. 22
Figure 8. Post Card for Irrigation District Members Mailed Winter 2019/2020. 49
Figure 9. Public Scoping Title slide. 51
Figure 10. Public Scoping Question 2, Asian Clam Removal Chart. 51
Figure 11. Public Survey Q2, extent of agree or disagree to remove Asian Clams Table. 52
Figure 12. Public Survey Q3 Fisheries Improvement Chart. 52
Figure 13. Public Survey Q3 Agree or Disagree Fisheries Table. 53
Figure 14. Public Scoping Q4 State Park Improvements Chart. 53
Figure 15. Public Scoping Degree of Support Park Improvements Table. 54
Figure 16. Public Survey Q5, Visitation Open Water Chart. 54
Figure 17. Public Survey Q5 Visitation Open Water Table. 55
Figure 18. Public Survey Q6 Open Water Activity Chart. 55
Figure 19. Public Survey Q6 Open Water season Activities Table. 56
Figure 20. Public Survey Q7 Winter Use Chart. 56
Figure 21. Public Survey Winter Use Table. 57
Figure 22. Public Survey Q8 Winter Activity Chart. 57
Figure 23. Public Survey Q8. Winter Use Activity Table. 58

A. Background and Proposed Actions

Type of Proposed Action

Due to the discovery of invasive *Corbicula fluminea* in Lake Elmo during the summer of 2019, a collaborative effort is being undertaken among FWP's Region 5 Fisheries staff, the Fisheries AIS Bureau and Parks Division, to control and potentially eradicate the population of clams by fully draining the lake in fall of 2021 with refill in spring of 2022. In combination with this effort, the Parks and Fisheries staff are exploring the possibility of additional projects that would enhance visitor experiences and improve fish habitat. The opportunity to have the lake drawn down or drained decreases cost and complexity to complete restoration tasks in the reservoir. Collaboration with stakeholders has begun with scoping and interactions with several interested groups. The following information is provided to allow the public to consider proposals and provide input in the process as well as consider ways to fund and implement the plans.

Agency Authority for the Proposed Action

Corbicula fluminea Control and Removal. MCA 12.5.706 Identified areas threatened with aquatic invasive species and applicable quarantine measures.

Fisheries Habitat Section 23-1-110, MCA, and Administrative Rules of Montana (ARM) 12.2.433 guides public involvement and comment for the improvements at state parks and fishing access sites. 12.2.454 ARM Categorical Exclusions and special circumstances. 87-1-272 MCA Future Fisheries Program,

Parks and Access Improvements Section 23-1-110, MCA; ARM 12.8.602 requires FWP to consider the wishes of the public, the capacity of the site for development, environmental impacts, long-range maintenance, protection of natural features and impacts on tourism as these elements relate to development or improvement to state parks 23-1-126 MCA Good Neighbor Policy, SHPO, 23-2-101 MCA Land and Water Conservation Fund

Project Name

Corbicula fluminea Eradication and Lake Elmo Habitat and Access Improvement Project

Project Sponsor

Montana Fish, Wildlife, and Parks
2300 Lake Elmo Drive
Billings, MT 59105

Anticipated Schedule

Table 1 provides an outline of the proposed schedule and general activities. The project is less than five percent designed. Some elements have a preliminary design and rough cost estimate. Grant submissions have been initiated to secure funding for some fisheries elements of the proposed project. Success of grants, availability of FWP funds and public interest and participation will help direct final planning and design for the access and habitat projects described in this document.

Event	Date
Public Comment Period	October 16, 2020–November 18, 2020
Public Meeting	Not anticipated
Decision Notice (estimated)	December 15, 2020
Partial Drawdown	Started September, 2020
Potential Habitat Project (Partial work)	March 2021–April 2021
Refill	April 2021
Full Drawdown	September 2021–October-2021
Construction	August 2021–May 2022
Refill	April and May 2022
Initiate Fish Stocking	May 2022

Table 1. Timeline of proposed actions.

Location of Project

The proposed project is in Yellowstone County, Township 1 North, Range 26 East, Section 15 within Lake Elmo State Park. Lake Elmo State Park is in the Billings Heights area (Figure 1), the FWP Region 5 office is adjacent to the Park at 2300 Lake Elmo Drive, Billings, MT 59105. Information for Lake Elmo State Park can be found at this link: http://stateparks.mt.gov/lake-elmo/

A conceptual plan was developed to capture ideas that include a lakeside program platform, picnic nodes, boardwalk, and sediment stilling basin (Figure 2). Location of jetties are not established at this time. Criteria that maximize angler access to water from existing trails, wave breaks to improve emergent and submergent vegetation coverage, soils, or wildlife values will be considered when final plans are developed.

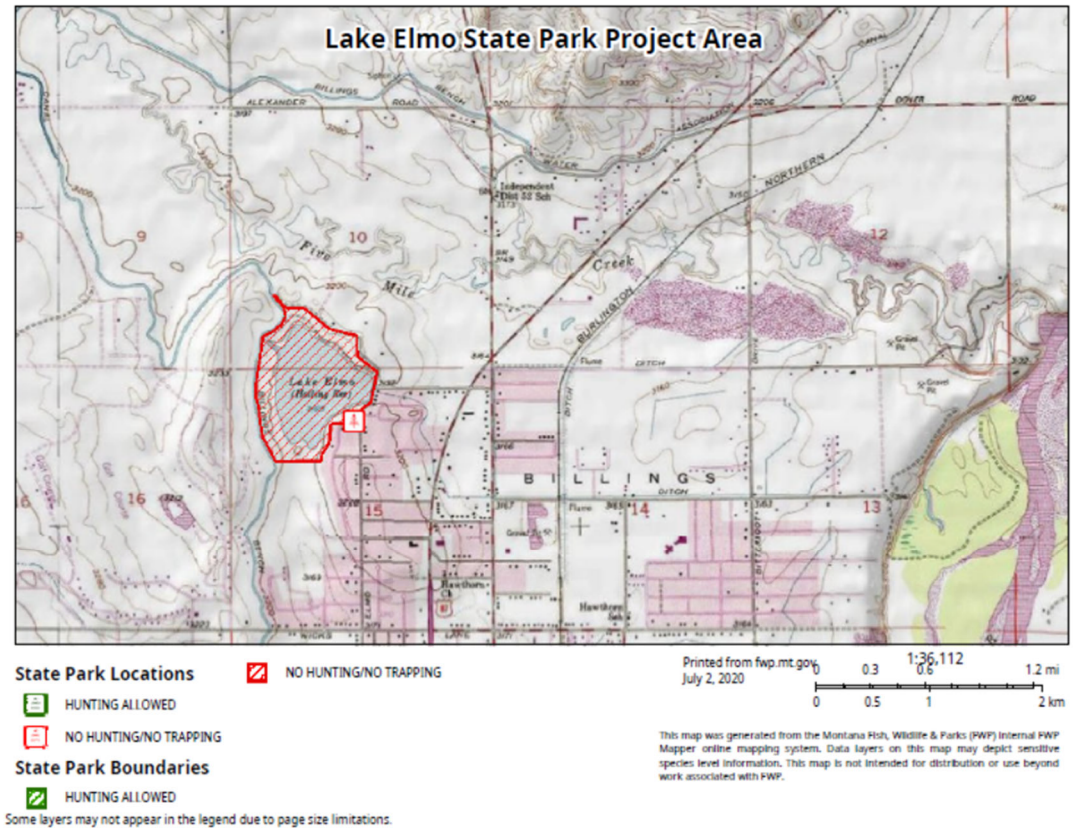


Figure 1. Map of Lake Elmo State Park.

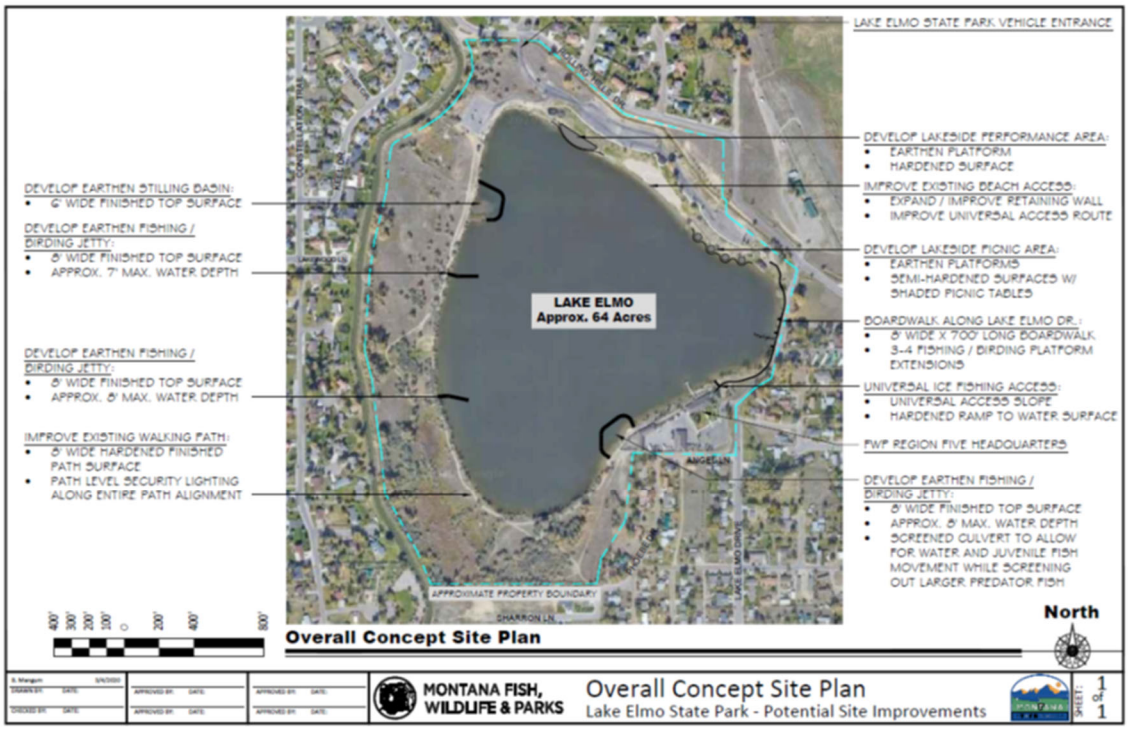


Figure 2. Lake Elmo Conceptual Plan Map.

Project Size

FWP proposes to temporarily affect 65 acres of Lake Elmo through partial and full drawdowns, and up to 30 acres of land surrounding the lake with various access and habitat improvement projects. As many as 10 acres of sediment from the lakebed may be removed and relocated along the northwestern side of Lake Elmo near the boat ramp in the grasslands area. Although this would disturb the vegetation, ultimately these actions will help restore approximately 10 acres of existing native grasslands. The Billings Bench Irrigation District has been working with irrigators to plan for the dewatering of Lake Elmo using the irrigation system.

Table 2. Acres of land affected by the proposed project.

Description	Acres	Description	Acres
Developed		Floodplain	0.00
Residential	0.00	Productive land-----	
Industrial	0.00	Irrigated Cropland	<624
Open Space	10.00	Dry Cropland	0.00
Wetlands-------		Forestry	0.00
Other Lakebed	63.44	Rangeland	0.00
Riparian Forest	2.32		
Riparian Shrub	4.23		
Freshwater Emergent	0.15		

Consultation

Montana Department of Environmental Quality (DEQ) 318 permitting, U.S. Army Corps of Engineers (ACOE) 404 permitting, Montana Natural Heritage Project (MTNHP), Yellowstone Conservation District (YCD), Billings Bench Irrigation District. Montana Sage Grouse Habitat Conservation Program.

Permits

Permits that may be required include:

- U.S. Army Corps of Engineers, Section 404 permit under the Clean Water Act.
- Montana Department of Environmental Quality 318 for Short Term Water Quality Standards of Turbidity.
- Montana Fish Wildlife and Parks 124 Permit.

Preliminary discussion indicates the DEQ 318 and FWP 124 permits likely would not apply to this project. The ACOE 404 may be required as some of the projects may have temporary impacts to wetlands and fill would be placed in the reservoir.

Budget

The budget presented represents the full goals of the proposed project (Table 3). Full funding has not yet been obtained. Financial support, donations of time and funds, community organization will be necessary to fully implement this project. Funding sources will determine which elements of the project can be funded. Reduced project implementation will be required if the financial targets are not met. The 2021 legislature would need to approve the authority to spend more than $150,000 of funds secured for this project.

Table 3. Full Projected Budget.

Lake Elmo Budget	Estimated costs	**Funding Source**	Funding
Aquatic Invasive Species			
Drawdown	$ 5,000.00		
Contingency	$ 5,000.00		
Aquatic Invasive Species Subtotal	$ 10,000.00		
Fisheries Projects			
Jetties	$ 150,000.00	PikeMasters	$ 20,000.00
Nodes	$ 100,000.00	Walleyes Unlimited	TBD
Artificial Habitat	$ 30,000.00	American Fisheries Tackle Company	
Imported Habitat	$ 50,000.00	Montana BASS Nation	$ 5,000.00
Sediment Retention	$ 30,000.00	Community Pond Grant MTFWP	$ 10,000.00
Excavation	$ 50,000.00	Future Fisheries Grant	$ 40,000.00
Contingency	$ 47,500.00		

Fisheries Subtotal	$ 457,500.00	Subtotal of Current Funding	$ 75,000.00
Park Projects			
Boardwalk	$ 67,500.00		
Boardwalk Nodes	$ 15,000.00		
Irrigation Headgate	$ 2,500.00		
Jetty Surfaces	$ 15,000.00		
Program Stage	$ 5,000.00		
Dispersed Picnic Nodes	$ 25,000.00		
Dog Park Shoreline	$ 7,500.00		
Shoreline Erosion	$ 20,000.00		
Trail Improvements	$ 100,000.00		
Contingency	$ 25,000.00		
Parks Subtotal	$ 282,500.00		
Estimated Total	$ 750,000.00		

Lake Elmo History Brief

Lake Elmo is a reservoir in northern Billings, Montana, originally built in the early 20th century to store and transport irrigation water. Currently it is a very popular state park and urban fishery. Prior to the construction of the irrigation canal system in 1905, what now is Lake Elmo likely was an intermittent wetland. By 1915 the waterbody, then known as Holling Lake, had filled regularly with drainage and seepage from the canal. Surveyors described the waterbody as a 65-acre lake able to irrigate 624 acres. In 1920, the Billings Bench Water Association approved lake development plans and additional connections to the irrigation system to increase water supply.

As part of the negotiations, development rights were retained by the McCracken family to use the lake as a resort. The Elmo Club was constructed in 1929 and named after their grandfather, Elmo McCracken. In 1930, the lake was renamed Lake Elmo. The Elmo Club was a very popular place for dining, entertainment and boating until the building burned in 1949 and never was rebuilt.

By the 1960s, Lake Elmo had become a water ski, motorboat and party spot. However, in the 1970s, plans were created to subdivide and develop the land around Lake Elmo. Opposition to the loss of public lake access resulted in a grass-roots endeavor to secure the area into the Montana state park system. In 1983, the lake was purchased by the state for $1 million with an expansion of 42 land acres for another $600,000. Since its formal inception, Lake Elmo State Park has been managed by FWP.

Further improvements to the park were made in 1993 following approval of $300,000 from the Montana state legislature. In 1994, the only fishing pier (Rogers Pier) was built using a grant from the Sport Fish Restoration Program. Additional improvements to trails, restroom facilities, the beaches and other projects have been completed by the Parks division over the years.

Corbicula fluminea Summary

Corbicula fluminea are invasive clams not to be confused with native mussels that are also found in Lake Elmo. *Corbicula fluminea* (Asian, golden or good luck clams) were first detected during an FWP AIS bureau training in June 2019 at the boat ramp along the northwestern shoreline of Lake Elmo. Currently, Lake Elmo is the only waterbody in Montana with a documented presence of *Corbicula fluminea*. Shortly after the discovery, the AIS team conducted intensive surveys in the lake as well as in upstream and downstream canals and nearby Rattlesnake Reservoir. Additionally, irrigators were asked by mail survey if they had noticed any clams in the ditches or around their head-gates (Appendix K.1 Figure 8).

Results from the 2019 AIS surveys documented *Corbicula fluminea* only in Lake Elmo and found live specimens in relatively shallow water (Figure 3) with no reports from irrigators confirming clams in the irrigation ditch. Live juveniles and shells of adults and juveniles were discovered in the lake suggesting that *Corbicula fluminea* successfully reproduces in Lake Elmo and have been in the lake for several years. The source of *Corbicula fluminea* in Lake Elmo as well as the amount of time the clams have been in the lake are unknown.

Summer and fall 2020 AIS surveys detected live clams using a plankton tow and a specialized bottom dredge built by FWP AIS staff. Plankton tows are used to sample small aquatic organisms by attaching a jar to the end of a net and slowly pulling it behind a moving boat. As the tow moves, excess water exits through the mesh netting and microscopic organism are collected in the jar. Early results indicate that one of the samples collected included a larval (microscopic) clam, this would confirm reproduction is actively occurring. The specialized dredge discovered several live specimens and numerous shells throughout the lake. Visual surveys simple shoreline walk/wading surveys discovered several additional live clams and an abundance of dead shells. A Lockwood school group recently visited Lake Elmo to conduct a pond survey and they collected at least two additional live clams. This data confirms the continued presence of viable invasive clams. The partial drawdown implemented in September 2020 was initiated with anticipation of reducing the population of clams. This will reduce the threat until the EA process is completed, which may lead to fully developing the plan, securing funding and implementing.

Corbicula fluminea are bivalves native to eastern and southern Asia. Adults grow to a maximum length of around two inches. Like other bivalves, *Corbicula fluminea* are filter feeders that eat small food particles such as zooplankton in the water or surrounding soil. Compared to other freshwater bivalves, they have the highest rates of filtration, food consumption and growth of any species. *Corbicula fluminea* prefer areas with abundant food and oxygen, restricting them to near-shoreline sandy and gravel places which constitute nearly all of Lake Elmo.

Corbicula fluminea reach sexual maturity between the ages of one and four. An individual clam can start a population since they can both self-fertilize and cross-fertilize. One clam can produce one million or more offspring in a lifetime. Spawning activities occur in the spring when the water temperature approaches 60 degrees Fahrenheit. The clams typically reproduce twice a year. *Corbicula fluminea* can rapidly grow into large populations, even though sudden changes in temperature, oxygen and pH can quickly cause high rates of mortality. Because of their life history traits, they can quickly repopulate an area, even after an entire population has been nearly wiped out. Additionally, these traits allow *Corbicula fluminea* to successfully live in habitats disturbed by human activity, such as impoundments like Lake Elmo.

The effects that *Corbicula fluminea* have on ecosystems can be costly and devastating.

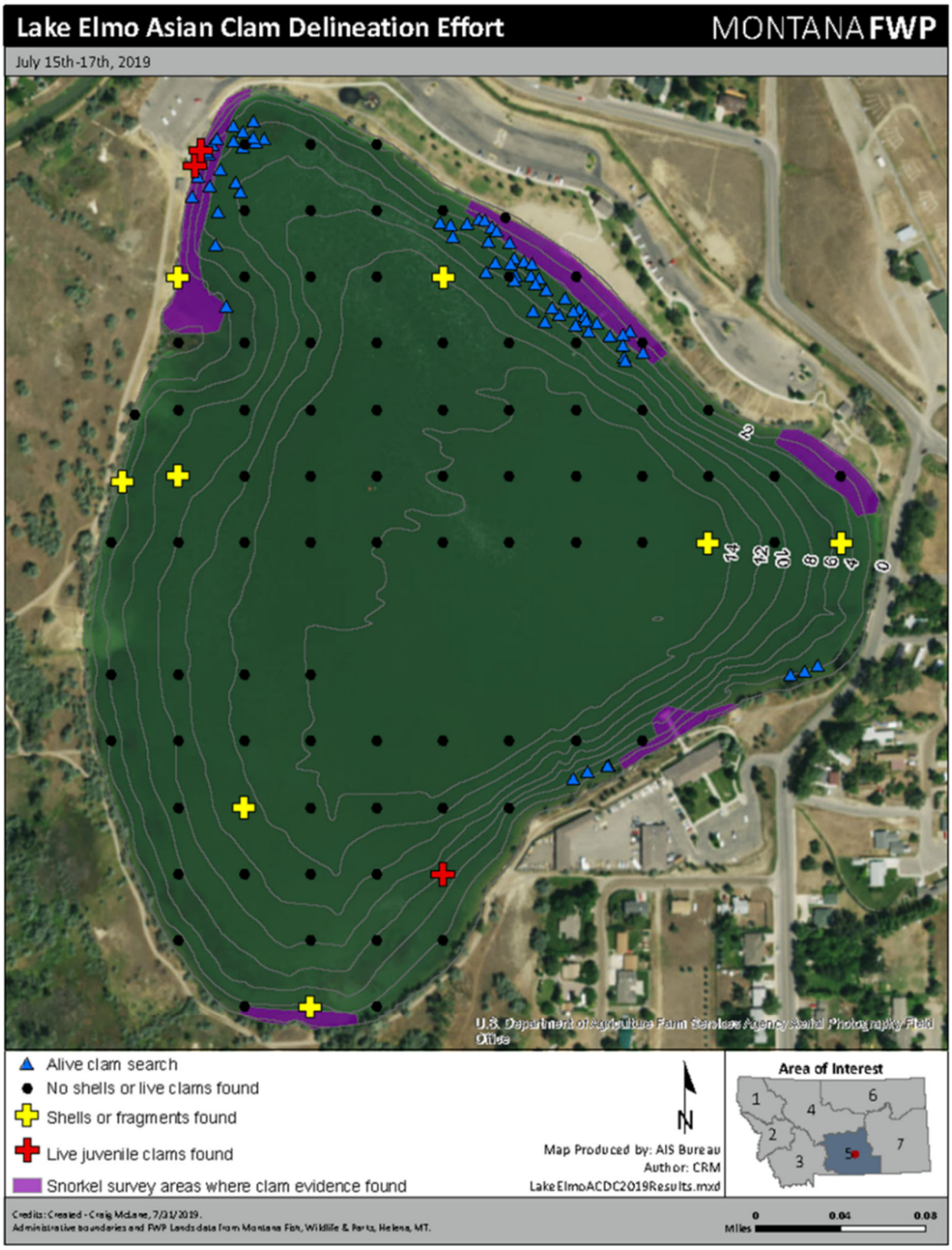


Figure 3. Lake Elmo Corbicula fluminea 2019 sampling results.

Corbicula fluminea do not permanently attach to hard surfaces, but float through the water either free floating or temporarily attached to buoyant material as juveniles before settling on the bottom. Because of their small size, *Corbicula fluminea* can float through screens and filtration systems and later clog and block irrigation canals, pipes and other water intake systems as they mature. Furthermore, their high filtering capacity removes small particles in the water that often are important food sources for other animals such as fish, turtles and native mussels. The clams can pass through a fish or turtle alive and undigested. *Corbicula fluminea* negatively affect water quality and can promote an increase in bacteria and plant growth as well as cause harmful algae blooms, such as blue green algae. Clam shells from dead individuals are sharp and can rapidly accumulate in beach or swimming areas, causing a safety hazard for waders and swimmers.

Public scoping conducted by FWP in the spring of 2020 found strong support for the proposed actions. (Appendix K.3 Figure 10).

Fisheries Summary

Fisheries management for Lake Elmo started in 1931 with stocking of yellow perch, crappie, sunfish (presumably pumpkinseed and bluegill) and largemouth bass. In 1936, a second stocking of bass and crappie occurred. Stocking then ceased until 1984 when the state purchased the park. From 1984 to 1996, largemouth bass and channel catfish were regularly stocked. In 1998, rainbow trout stocking was initiated as a put-and-take fishery. The trout plants were successful, and anglers responded positively. Rainbow trout stocking now occurs annually with supplements from other trout species when available, such as Yellowstone cutthroat trout and brown trout (Figure 4).

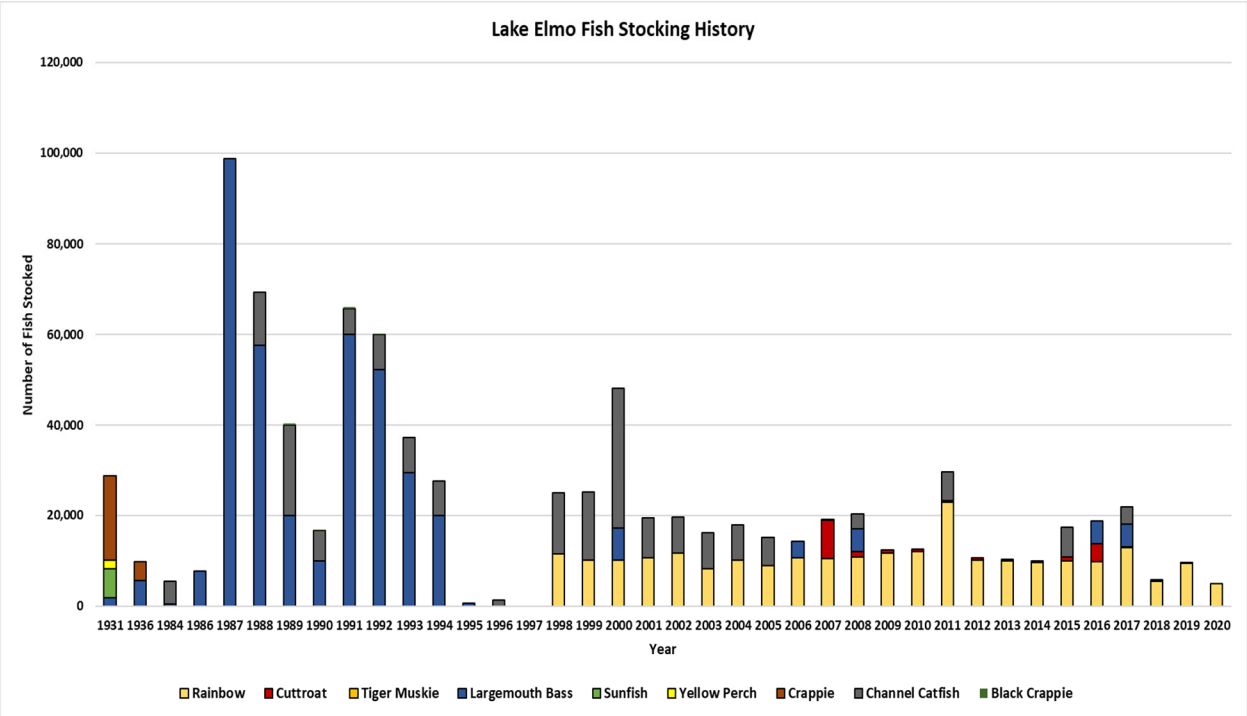


Figure 4. Fish Stocking History of Lake Elmo.

In the early 1990s, a Christmas tree reef project for perch spawning and fish cover was initiated, and PVC catfish condos were installed in the lake. Improvements were facilitated by the local bass fishing club.

In the recent scoping survey, participants indicated that fishing is the number-one reason people visit the state park year-around. Approximately 75 percent of respondents indicated that they fished Lake Elmo in the summer as shoreline anglers (Appendix J.3 Figure 16). Shoreline fishing in summer ranked as the top activity with walking/hiking second followed by boat fishing for the most reported reasons for using Lake Elmo State Park. Ice fishing was reported by 80 percent of the respondents and ranked as the primary use of Lake Elmo when asked which activities they engaged in if they use the park in the winter (Appendix J.3 Figure 20).

Angling effort also is documented by a creel survey mailed out every two years to randomly selected license holders (Figure 5). Fishing efforts since 1989 vary from a minimum of 1,000 angler days to more than10,000 angler days, peaking in 2009 and 2011. The increase in angler days from 1993 to 1997 probably is related to stocking channel catfish. The subsequent increase in 1999 is attributable to adding trout stocks (Figure 4). Lake Elmo likely receives much more angler pressure than documented by the licensed-angler mail survey. The survey does not gather information from juvenile anglers for which purchasing a fishing license is not required. Organized angler education programs (e.g., Kid's Fishing Days) alone would add more than 1,000 angler days annually at Lake Elmo.

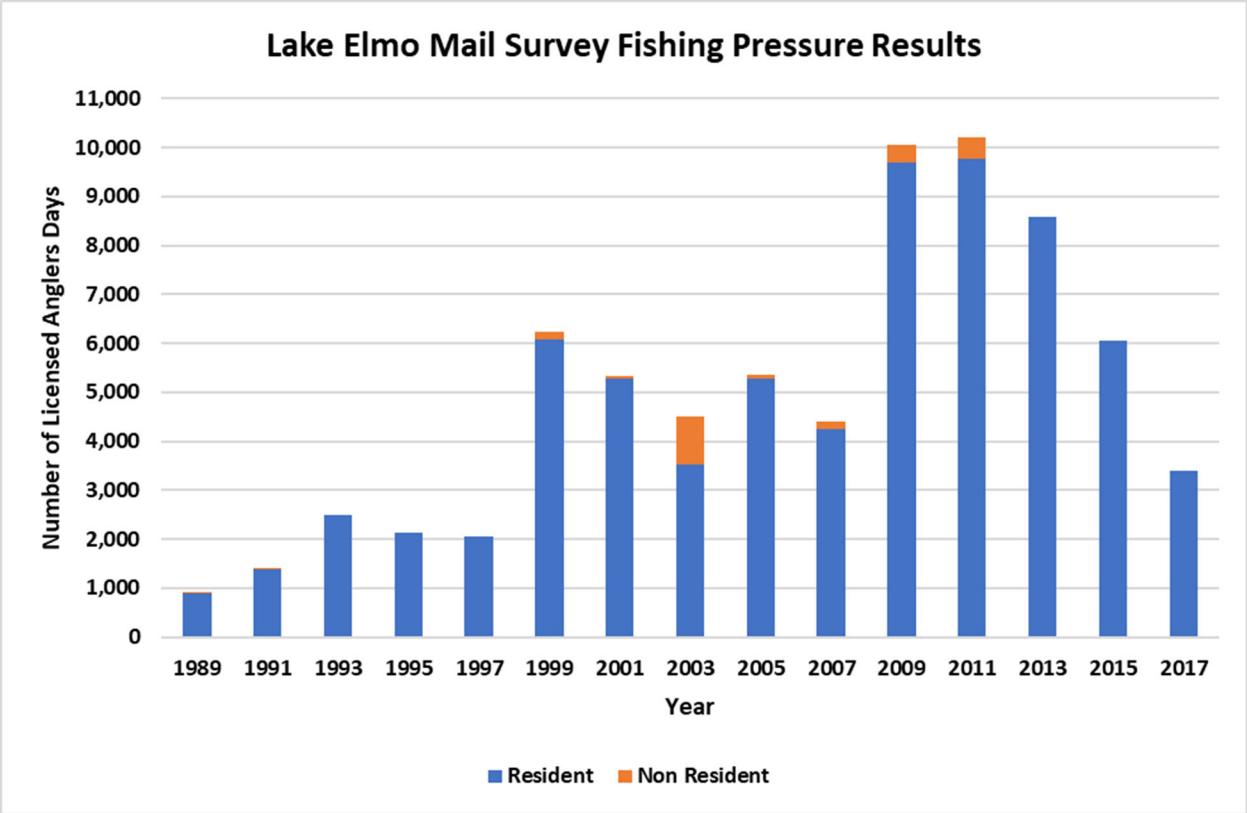


Figure 5. Results from FWP Angler Mail Survey for Lake Elmo 1989–2017.

The public scoping survey showed strong support for improving fishery habitat and access (Appendix I.3 Figure 12). Efforts to secure funding for proposed projects has begun based on public support from scoping. The EA will inform the public of potential projects that might be completed if an alternative to improve habitat and angler access is selected. Local fishing organizations continue to indicate a keen interest in the Lake Elmo fishery and are ready to commit resources that benefit anglers.

Parks Summary

Lake Elmo State Park is a highly used 123-acre park with 64 acres occupied by water. The fishery is important, but only one of the park's amenities. The park provides 1.4 miles of walking trails that allows users to pass through wooded and open areas, plus lake-edge picnic and playground areas.

The diverse habitats attract a variety of birds, which draw birdwatchers. A large beach was developed for swimmers and beachgoers. A 200-square-foot area is fenced off as a dog play area, allowing pet owners to let their dogs off leash with access to the water. The trail can provide cross-country skiing opportunity in the winter. The lake supports non-motorized or electric-motor boating, sailing, floating and wind surfing opportunities. The lake is used as a training facility by local fire and rescue teams for water-based actions.

Visitor-day surveys indicate high use of Lake Elmo, with all but 2011 and 2018 having more than 150,000 visitor days (Figure 6) and it consistently ranks in the top five most-visited Montana state parks. Park visits at Lake Elmo SP in 2020 were up significantly as a result of people seeking outdoor experiences close to home during the Covid-19 pandemic. A Montana State Parks survey of the public conducted by the University of Montana to determine resident desires for park amenities found that 90 percent wanted improvement to trails, 77 percent to picnic areas, 65 percent to swimming beaches, 64 percent to interpretive and program areas, and 47 percent to boating facilities.

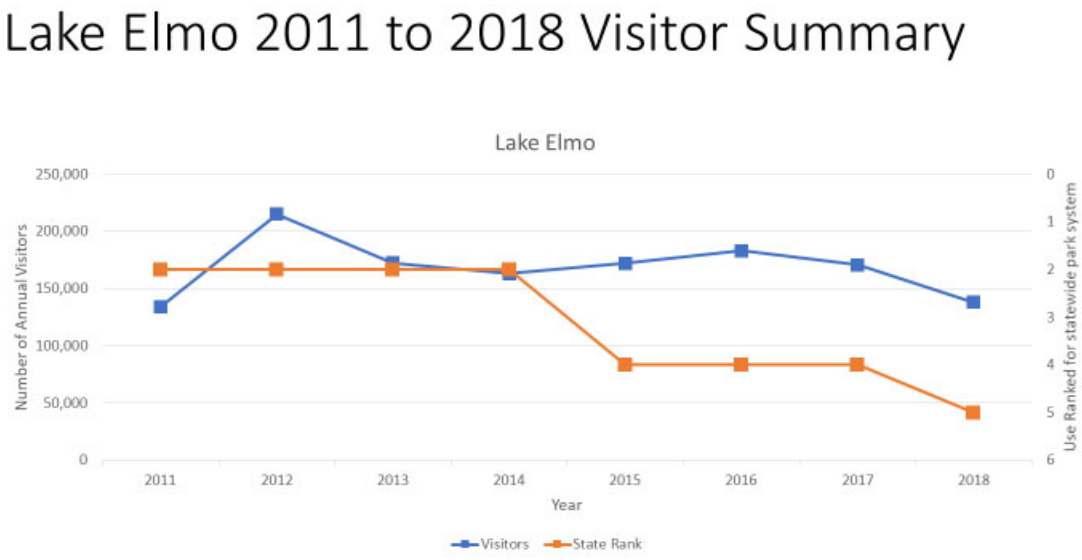


Figure 6. Lake Elmo Visitor Summary 2011–2018.

Projects suggested for the state park include trail improvements including creating a safe overwater boardwalk along Lake Elmo Drive, additional single-unit picnic table nodes at the edge of the water, a program/performance natural stage, improvements to the dog area shoreline, and bank protection in select areas. The proposed boardwalk would include two to four nodes that would act as fishing piers, birdwatching, and sightseeing areas for park visitors. The nodes would function like the expanded end of Rogers Pier, an accessible pier located on the south end of the lake.

B. Alternatives

FWP is considering three alternatives to further manage *Corbicula fluminea* in Lake Elmo:

- **Alternative 1** is the no-action alternative. Under this alternative, existing management of the lake and state park would not change. There would be no further attempt to eradicate the clams and no efforts taken to make improvements to habitat or recreation opportunities.
- **Alternative 2** would manage access and use of Lake Elmo to restrict expansion of *Corbicula fluminea* beyond Lake Elmo but would not include a full drawdown of the lake.
- **Alternative 3** would result in a full drawdown of the lake to expose the entirety of the lakebed beginning in September 2021 with refilling starting in April of 2022. This alternative includes improvements of fisheries habitat and park amenities. A more extensive discussion of alternatives can be found in section C.

1. No Action

Under this alternative, FWP would not try to manage the presence of this species in Lake Elmo. This action would continue to expose the irrigation system to the invasive clams and risk transport of the clams either through the irrigation system to the Yellowstone River or by human activity. People at Lake Elmo use boats regularly and other shoreline activities such as beach toys, dog training devices and others inadvertently or purposefully could pick up and transport the clams to other waterbodies.

2. Mange Park and Lake Access to Control Invasive *Corbicula fluminea*

This alternative would control clam population expansion beyond Lake Elmo through required cleaning stations and visitor restrictions.

3. Drain, Dry, Freeze to Remove *Corbicula fluminea* Population and Implement Fisheries and Park Projects

This alternative requires the lake to be drawn down and pumped. Not all water will drain by gravity to allow the bed of the lake to dry and freeze from September 2021 into April 2022. This alternative would implement fisheries habitat projects and park improvements that have design, funding and, if necessary, contracting in place preceding the drawdown. Fish habitat projects include jetties plus the portions of the program and picnic nodes that are underwater and can provide diversified habitat, artificial habitat, imported natural habitat, sediment retention, sediment excavation and removal. Parks project include a boardwalk, nodes as part of the boardwalk, irrigation headgate improvements, jetty surface trails which would include program stage and picnic nodes, dog park shoreline and area improvements, shoreline restoration, and overall trail improvements.

C. Alternative Analysis

1. No Action

Under the no-action alternative FWP would continue with existing management of the lake. The lake would not be drained and there would be no attempt to control or eradicate invasive *Corbicula fluminea* or reduce the potential for *Corbicula fluminea* to spread beyond the lake. The lake would continue to be stocked with approximately the same fish species and the same numbers of fish, depending on availability of fish and lake conditions. There would be no change to the recreation opportunities offered in either the short or long term. The no-action alternative leaves a viable population of *Corbicula fluminea* that may spread either by human or natural actions. Continued monitoring by AIS staff would be needed for the clams and other invasive species. A no-action alternative would provide a source of invasive clams to potentially expand into a large area of the Yellowstone and Missouri River Basins currently not known to be occupied by *Corbicula fluminea*. This action could be a negative impact to the natural and human environments. The irrigation district or others may find alternative means to contain this

species if the no-action alternative is selected.

2. Manage Park and Lake Access to Control Invasive *Corbicula fluminea*

Under this alternative FWP would attempt to minimally control *Corbicula fluminea* populations and implement management strategies to contain the clams in Lake Elmo. Minimal control actions considered would be annual or more frequent partial drawdowns complemented with screening measures to minimize potential of down-canal expansion. If these measures were ineffective, bypassing Lake Elmo with the canal system would need to be considered to isolate Lake Elmo from the down-canal system. Bypassing the lake would reduce the amount of water exchanged through the lake. Changes to water exchange might result in changes in water quality and increases the frequency of harmful algae blooms. Changes of water characteristics may change which fish species continued to be managed as trout may not do as well under this scenario. AIS staff would need to increase down-system surveillance to ensure the clams were not dispersing.

This alternative would require FWP to implement increased AIS and Park staff presence to ensure that visitors do not move clams with watercraft, swim or beach toys, or direct collection. Visitor restrictions could include additional regulation of boating, number and types of watercraft allowed, change in visitor hours, ability to use various beach toys, or other necessary methods to reduce collection and movement of the clams from Lake Elmo. Actions taken at other waterbodies that have had infestations of invasive species include required decontamination before leaving the waterbody. This may include having staff available to operate a cleaning station which could limit the number of watercrafts allowed, restrict visitors to hours and days of operation and slow down departure rates for visitors with watercraft and beach toys.

Increasing and maintaining staff and equipment under this alternative was not fully investigated. The opportunity to fully remove this invasive clam population and invest in park and fisheries resources as a result of the action seemed to better address the situation and provide more public benefit than planning to build a containment program and system and not improve park and fisheries resources.

3. Drain, Dry, Freeze to Remove *Corbicula fluminea* Population and Implement Fisheries and Park Projects

Under this alternative, FWP would attempt to eradicate *Corbicula fluminea* in Lake Elmo. A full draw down in the fall of 2021 would be an attempt to remove the *Corbicula fluminea* population. It is likely that the lake cannot be drawn down completely with gravity through the ditch system. The headgate structure reaches a depth of 13.5 feet with an additional three feet of water expected to be lower than the headgate. Pumping will be included as part of this action to complete the draining process. Excavation of a channel to the headgate will be necessary to remove sediment in front of the head gate and to efficiently pump the remaining water. The objective is to drain the lake, allow the sediments to dry as much as possible then freeze over the winter. This provides an economical response with the best opportunity to remove the population of invasive clams. The lake would be refilled in the spring of 2022.

If pumping failed to remove any water thought to harbor invasive clams, use of chemicals would be considered. This would require further investigation and a supplemental EA before being considered. FWP will continue to evaluate this potential need by reviewing literature and consulting other states, agencies, watershed groups and private citizens.

The use of chemical or other physical actions to remove the population of invasive clams were not fully considered or evaluated as part of this EA. Many effective chemicals are not labeled for use as a molluscicide and chemicals that are labeled for use would be expensive and difficult to apply to a full reservoir. The use of chemicals increase potential for a larger affected area than desired. Physical coverings over known beds would require covering the entire lakebed as shell fragments have been found throughout the lake. Studies evaluating physical covering and localized treatments have only been successful in managing but not removing populations. The relatively small size of Lake Elmo and being an artificial impoundment with means built in to drain makes the drain, dry, freeze alternative feasible.

A complete drain will result in the loss of other non-target aquatic organisms, particularly fish and native clams. Many invertebrates in the reservoir will either recolonize through their ability to tolerate drying and rehydration. Others will arrive as flying and crawling adults which would colonize from other sources. Additionally, water from the Yellowstone River carried via the ditch will introduce other organisms including plankton, invertebrates and some fish species.

Native clams likely were introduced through the ditch system by fish hosts or humans. Their presence, popularity and potential loss has generated conversations about how to save or reintroduce them. Alternatives to restore native mussels will be investigated, which may include overwintering them in a natural or tank environment, collecting wild adults and replanting, anticipating natural recruitment and others. Discussion with the Natural Heritage staff and David Stagliano have been initiated. FWP will follow up with a literature review and likely contact with other states or agencies to explore possibilities while maintaining safe practices to not transport invasive species or diseases in the process.

Evidence exists that some fish, including channel catfish, can transfer live *Corbicula fluminea* through their digestive system. Other fish such as perch, sunfish, bass and suckers are known to ingest *Corbicula fluminea*. It is unknown whether the clams can successfully pass through these fish species' digestive systems, but it is possible. Since fish could transfer live clams if transported to other water bodies, fish from the lake would not be captured and moved.

Harvest regulations for fish could be lifted in 2021 to allow anglers to take an unlimited number of fish from Lake Elmo prior to draining. Current limits apply to combined trout, bass, channel catfish, crappie, and tiger muskie. No harvest limit exists for yellow perch, sucker, carp, bluegill or pumpkinseed sunfish. An alternative would be to maintain the limit on the trout, since they are stocked for harvest. Fisheries staff would need to get approval from the FWP Commission to remove limits one-time for this project from the start of summer 2021 until the reservoir is unsafe to fish in the fall of 2021, at which time access to the reservoir would be limited to project personnel and contracted services. This will provide the public an additional period to comment specifically to this detail.

In anticipation of the proposed draining of Lake Elmo, stocking efforts for channel catfish, bass and tiger muskie have ceased until a decision is finalized. FWP plans to stock catchable trout through the spring of 2021 to provide angling opportunities. All stocking would cease from June 30, 2021, until the reservoir is filled in April and May 2022. Catchable-size trout would be introduced as soon as possible. Fathead minnows, yellow perch, channel catfish, bluegills and largemouth bass may be available from the Miles City Hatchery and stocking of those species would be initiated as available.

Fathead minnow stocking would be conducted to establish a forage base for predatory fish. Juvenile predatory fish such as yellow perch, channel catfish, bluegills and largemouth bass would be stocked at low densities to allow for the insect and forage-fish production to expand. Stocks of lake chub and crappie are not available in the Montana hatchery system. Wild fish transfers would be planned to capture fish to start desired fisheries not available from the hatchery system. Wild fish transfers require fish health testing and AIS sampling in both the donor water and fish population to minimize the risk of moving unwanted fish diseases or invasive species.

Currently, there are no plans to install or maintain fish screens to reduce the number of fish entering Lake Elmo from the ditch. However, a sediment retention system will be evaluated, and it may reduce the rate of fish entering from the ditch system. The ditch is likely to move white suckers, shorthead redhorse, common carp, stonecats and other fish found in the Yellowstone River near Laurel to Lake Elmo. If populations of suckers, carp and other fish expand, tiger muskie would be considered to assist with management of non-target species. Improving the trash rack with potential to improve fish screening at the outlet will be evaluated and implemented as part of the fisheries and parks projects. The irrigation district annually must clean out trash left by people inside of the headgate structure. The design could reduce this annual maintenance need.

This effort would allow for extensive in-reservoir work to be conducted more efficiently. Mobilization of equipment and focus on Lake Elmo also makes projects in the area less costly if completed in a single extensive project. Those additional activities will not result in any significant additional environmental or human impacts beyond the draining, drying, and freezing of the lakebed. The fisheries and parks elements considered to date include:

A. Jetties

Earthen jetties create irregularity in pond shorelines, increase shoreline length, and can incorporate important habitat features (

). Anglers often use jetties as they find areas to disperse and access habitat features used by fish. In this effort jetties could be built in both the partial and full drawdown periods. Construction is preferred when adequate shaping of the bottom and bed material in the jetties can be used to decrease cost of materials and reduce importation of new material in the reservoir.

One to five jetties could be built depending on available funding. Jetties would be designed to provide habitat with benches of gravel for spawning substrate, large rock for catfish spawning and juvenile fish cover. They may include placement of large woody material, such as cottonwood or other trees. Jetties can be built strategically as breakwaters to protect banks and

allow for natural development of submerged and emergent aquatic vegetation. Exposed surfaces of the jetties can be developed to support visitor and angler access. Some jetty surfaces could be considered for extended habitat for birds and turtles and would have limited development or access. The surface of the fish habitat jetties can also be designed to improve access including ADA access or be places used to increase habitat for shoreline wildlife.

Figure 7. Miles City Spotted Eagle Pond Jetty.

B. Program Stage

A program stage with a base supporting fisheries habitat could be built near the playground area as the bank slope would act as a natural amphitheater for performing artists or allow park staff to host events. While the intent of the program stage and dispersed picnic areas are to provide additional amenities and access for park visitors, the designs can incorporate fish habitat along their lakeside edges like the jetty concept.

C. Dispersed Picnic Areas

These areas could be incorporated around the reservoir with the base supporting fisheries habitat and the surfaces with picnic tables for small family or group areas. They could also provide shoreline protection measures in strategic locations.

D. Artificial Habitat

There has been growing interest in using recycled materials to create artificial habitats for fish. These include creation of large plant-like beds or places for periphyton to grow and work as attracting habitat for fish. They have a much longer lifespan than traditional Christmas tree reefs.

The structures can provide spawning habitat for many fish species. In this case they would likely be used by yellow perch as spawning structure. These structures create long-lasting cover habitat for fish of all sizes with designs using various sized material to support different sizes of fish.

Artificial habitat can improve spawning success for cavity-nesting species such as channel catfish. PVC and aluminum plant designs would incorporate various dimensions of height and width. Basic designs use concrete to hold the material in place.

Local angling groups would likely volunteer to build structures. FWP would provide designs and materials. Projects could be organized for small or large groups. Individuals, families or groups could pick up supplies and build at home or other offsite locations and deliver them to the project site when completed. A total of one to two acres of material dispersed around the reservoir would be ideal.

Catfish condos, a type of artificial habitat, provide spawning cavities for channel catfish, which the males protect to improve survival of juvenile catfish. These condos are like bird houses but for use by catfish. They can be created using metal, plastic, or wood. Cavities in rock piles also provide for channel catfish habitat. Plans and materials would be provided to volunteers who wish to build these structures. Fifty or more catfish condos could be dispersed around the reservoir and incorporated in some of the other features or as standalone elements.

E. Imported Habitat

Rubble piles: These piles are composed of rocks and trees placed in piles to provide spawning and cover habitat. They would be dispersed in shallow and deeper habitats. Large rock would be used to partially bury trees to keep them in place. Some may be placed on imported gravel beds to provide cover for crappie, bluegills and bass as they hatch from the spawning gravels and hide in the rock and tree piles. Ten to 100 piles ranging in size from single 3x3-foot boulders to larger piles up to five feet high with widths and lengths ranging up to 20 feet are desirable.

Spawning gravel: Spawning gravel should be distributed around the reservoir from 0.5 to six feet deep with sizes ranging from pea gravels to one inch. Bluegills prefer larger areas for colony spawning aggregations while bass will spawn on individual sites. If substrates are too soft, gravel may need to be placed over liners or other barriers to prevent the gravel from disappearing in muck. Jetties can have benches of less than three percent slope created on them to provide spawning areas. Park improvements of picnic and program nodes also could incorporate these gravel beds in the designs.

Tree reefs and stumps: A common practice for many water bodies to improve habitat is to place Christmas trees in long rows using concrete blocks or other weights to hold them down. Christmas tree reefs have a life span of about two years. Cedar, Russian olive and other trees may increase the effective life span. Placement of larger woody material such as full trees and stumps also could provide cover and spawning habitat. The goal for tree reefs and stumps is to have smaller clusters of three to five feet square covered and spread out with distances of 10 to 15 feet covering a total of four acres of reservoir area in water from three to six feet deep.

Tree piles: Larger woody material and heavy brush such as cottonwood, conifer and other brush such as Russian olive branches could be placed in rock piles to create additional habitat and structure. Thirty to 50 percent of the rock rubble piles should incorporate trees and limbs that are four to ten feet long with diameters from four to 24 inches.

F. Sediment Retention

Limited amounts of sediment are introduced annually into Lake Elmo from the ditch. The sedimentation that does occur is slowly filling the reservoir. Establishing a one- to two-acre sediment retention area would capture much of the sediment in an area that could be dewatered readily, allowing equipment to remove the sediment. This area likely would serve during periods of filling as a wetland area. The outer berm also might contain spawning gravel, rock piles or tree reef habitats that would be less accessible to shoreline anglers.

Areas around the berm might also use existing sediment to maintain or create shallow-water habitat and wetlands outside the new sediment collection area. The existing cattails and rushes would be either transplanted or left in place if possible. Expansion of wetland habitats is anticipated as part of the plan.

G. Excavation

Excavation of sediments would create more midwater to deep habitat. It is likely that stratification of Lake Elmo creates an anoxic (no oxygen) zone in midsummer. However, enough cool water exists to support trout. Using this opportunity to improve depths from shallower water to as much as 20 feet would increase the area of oxygenated, cooler water for summer refuge and winter depth.

Materials from the excavation could be used to create an undulating plain on the west side of Lake Elmo in the native grass area. The area, if used, may benefit from having low rolling hills to change topography to support a variety of native plants that would use created microhabitats. This area could be reclaimed to support a wider variety of native grasses and plants. This area is within general sage grouse habitat however it also lies in a programmatic exempt area within the city limits of Billings. The project was submitted to the Montana Sage Grouse Oversight Team for input to restore the area potentially impacted with sediment placement.

H. Boardwalk

A boardwalk elevated over the shoreline edge parallel to Lake Elmo Drive would be constructed using either metal or concrete pilings to support a wood or composite deck. This walkway would connect trails near the large pavilion and the main office area in a manner that would increase safety of pedestrians who now walk on a narrow gravel path or on the street. This alternative may limit shoreline and lake access for wading at the footprint of the platform.

a. Boardwalk with Nodes

Create two to four extensions that would allow for angling or other use of the area and allow people to move off the boardwalk to maintain open space for hikers, wheelchairs and other users of the boardwalk main area. The nodes would be supported by the same materials as the boardwalk and match the surface materials and elevation. The widened end of Rogers Pier is an example of a node.

I. Irrigation Headgate Protection

The boardwalk will be designed to allow the irrigation district access to the headgate structure and ability to have equipment work around the headgate. Additionally, a cover or protective structure would be placed over the headgate to reduce vandalism and accumulation of trash. Updating and replacing the current trash screen to a screen that would reduce fish loss and trash collection in the system will be part of this effort.

J. Dog Park Shoreline

The shoreline along the dog park would be sloped and treated to reduce erosion and allow dog owners to more easily access the lake with their dogs. This area has very soft sediment which may be replaced with cobbles and gravel. Some areas have already received cobbles to provide a firmer bottom.

K. Shoreline Erosion

Several areas around Lake Elmo have had extensive shoreline erosion. A combination of soil with willow plantings, rock riprap, sloping and revegetating would be considered in several areas. The treatment may allow for creating undercut bank areas using log structures as a means to provide fish habitat and bank protection.

L. Trail Improvements

Trails will need to be created leading to the new structures. As part of this, it is anticipated the existing trail would be improved as the equipment and supplies would be available. Trails may be improved with gravel, rubber mulch, asphalt, concrete, wood or other suitable typical trail materials.

D. ENVIRONMENTAL REVIEW

The following tables summarize potential effects to the physical and human environments if the preferred alternative is selected and implemented.

D.1 LAND RESOURCES

Table 4. Physical Environment Land Resources.

Land Resource Comments

A. Soils will be affected in the short term by several factors.

A.1 Additional water will be placed on irrigated lands in the summer and fall when conducting the partial and full drawdowns. This will increase groundwater and irrigation returns. This is anticipated to be short term and not cause substantial changes to soils; irrigation return to Five Mile Creek and the Yellowstone River and groundwater conditions.

A.2 If sediments are excavated or dredged from the basin, they may be placed in a spoils

Will the proposed action result in:	IMPACT *				Can Impact Be Mitigated*	Comment Index
	Unknown *	None	Minor *	Potentially Significant		
a. **Soil instability or changes in geologic substructure?			x			A, A.1, A.2
b. Disruption, displacement, erosion, compaction, moisture loss, or over-covering of soil which would reduce productivity or fertility?			x			B
c. **Destruction, covering or modification of any unique geologic or physical features?		x				C
d. Changes in siltation, deposition or erosion patterns that may modify the channel of a river or stream or the bed or shore of a lake?			X positive			D
e. Exposure of people or property to earthquakes, landslides, ground failure, or other natural hazard?		x				E
f. Other:						

area within the park that will reduce costs to transport sediment and create rolling prairie features that would be reseeded with native grasses and shrubs. This would add one to four feet of soil in places over as many as 10 acres within the park. Areas of open space would be considered. This would change topsoil conditions in those area. The soil may need to be tilled to prepare it for planting.

B. Sediment would be disturbed at the lake bottom and either placed over or mixed with existing soils potentially in the park. Productivity and fertility are not expected to be significantly altered and the soil will be reseeded with various native grasses and shrubs.

C. The area being considered for soil placement was altered when the irrigation system's intake culvert was built under this area. The area was smoothed and appears as a restored field at this time.

D. A silt retention structure is planned, which would reduce sediment load from the irrigation ditch to the reservoir. If 10 acres of sediment with an average of 2 foot of depth can be removed this would be approximately 32,000 cubic yards of sediment removed from the bed of Lake Elmo. This would improve the amount of deeper water habitat potentially improving conditions for cold and cool water fish in lake Elmo during summer months. Shoreline erosion would be reduced by several elements such as shoreline protection, jetties working as breakwaters. Overall, the project would reduce future erosion and provide positive impacts to water quality and habitat.

E. This activity is not anticipated to create earthquakes, landslides or ground failure.

D.2 AIR

2. AIR Will the proposed action result in:	IMPACT *				Can Impact Be Mitigated*	Comment Index
	Unknown *	None	Minor *	Potentially Significant		
a. **Emission of air pollutants or deterioration of ambient air quality? (also see 13 (c))			x			A
b. Creation of objectionable odors?			x			B
c. Alteration of air movement, moisture, or temperature patterns or any change in climate, either locally or regionally?		x				C
d. Adverse effects on vegetation, including crops, due to increased emissions of pollutants?		x				D
e. ***For P-R/D-J projects, will the project result in any discharge, which will conflict with federal or state air quality regs? (Also see 2a)		x				E
f. Other:						

* Include a narrative explanation under Part III describing the scope and level of impact. If the impact is unknown, explain why the unknown impact has not or cannot be evaluated.
** Include a narrative description addressing the items identified in 12.8.604-1a (ARM)
*** Determine whether the described impact may result and respond on the checklist. Describe any minor or potentially significant impacts.
**** Include a discussion about the issue in the EA narrative and include documentation if it will be useful.

Table 5. Physical Environment Air.

Air Resource Comments

A. Heavy equipment will be required to conduct this work. Limited exhaust from the equipment may locally alter air quality with improvement through dissipation expected to occur quickly and likely not affecting areas outside of the construction boundaries. Dust may be temporarily generated from equipment and exposed lakebed sediments as they dry. It is anticipated freezing will reduce the amount of dust generated. Dust control measures BMP's would be employed if necessary, during construction.
B. Draining of the pond will expose sediment that will have an odor as it dries. Dead fish and plants in the reservoir will also create short term odor as the sediment dries and freezes. Reports from other state fisheries staff that have regularly renovated ponds indicate the smell may last a couple of weeks with the odor dissipating quickly.
C. No alteration of air movement, moisture or temperature patterns are expected due to this propose project.
D. No adverse effects to vegetation are expected due to any emissions as part of this project.
E. No emissions will conflict with federal or state air quality regulations

D.3 WATER

Will the proposed action result in:	IMPACT *				Can Impact Be Mitigated*	Comment Index
	Unknown *	None	Minor *	Potentially Significant		
a. *Discharge into surface water or any alteration of surface water quality including but not limited to temperature, dissolved oxygen or turbidity?			x			A
b. Changes in drainage patterns or the rate and amount of surface runoff?			x			B
c. Alteration of the course or magnitude of floodwater or other flows?		x				C
d. Changes in the amount of surface water in any water body or creation of a new water body?			x			D
e. Exposure of people or property to water related hazards such as flooding?		x				E
f. Changes in the quality of groundwater?		x				F
g. Changes in the quantity of groundwater?			x			G
h. Increase in risk of contamination of surface or groundwater?		x				H
i. Effects on any existing water right or reservation?			x			I
j. Effects on other water users as a result of any alteration in surface or groundwater quality?		x				J
k. Effects on other users as a result of any alteration in surface or groundwater quantity?		x				K
l. ****For P-R/D-J, will the project affect a designated floodplain? (Also see 3c)		x				L
m. ***For P-R/D-J, will the project result in any discharge that will affect federal or state water quality regulations? (Also see 3a)		x				M
n. Other:						

Table 6. Physical Environment Water.

Water Resource Comments

A. The drained water will be placed on irrigated lands within the irrigation districts ditch system. This will extend irrigation season. Return water is expected to reach Five Mile Creek then enter the Yellowstone River. Significant changes in water quality of receiving waters are not expected.
B. Changes are expected and will be short term. Irrigated lands will receive additional water later in the season than normal. The pattern of water movement is not expected to be altered other than the timing of flood irrigation.

C. No effect to floodwaters is expected as a result of the project.
D. Surface water will likely increase in Five Mile Creek during drawdown periods. Measurable changes in the Yellowstone River are unlikely.
E. No changes in exposure to flood waters are anticipated as the drawdown will use the headgate structures and ditch system associated with Lake Elmo.
F. No change in ground water quality is anticipated as a result of this project.
G. Groundwater temporarily may be maintained at a higher level in areas associated with the ditch but will not be changed from historic ditch use other than extended in October two weeks more than normal. Water rights extend to October 31st it is anticipated that the reservoir will be drained in 40 to 60 days so nearly drained by this date if a full draw down is conducted as planned.
H. No change in water quality of surface or ground water is anticipated as a result of this project.
I. No changes to existing water rights will occur as part of this project. This is part of an irrigation project with rights to fill and deliver water. The reservoir will be filled to meet annual water right needs each irrigation season. The irrigation district will use more water than normal to refill the reservoir each spring until the project is completed, however it falls within their rights. No effect to water rights as a result of this project are anticipated.
J. No effects to other water users are anticipated.
K. No effects on other users are anticipated as a result of this project.
L. This project is not in a designated floodplain.
M. No discharge from this project is anticipated to affect state or federal water quality standards.

D.4 VEGETATION

Will the proposed action result in:	IMPACT *				Can Impact Be Mitigated*	Comment Index
	Unknown *	None	Minor *	Potentially Significant		
a. Changes in the diversity, productivity or abundance of plant species (including trees, shrubs, grass, crops, and aquatic plants)?				x		A
b. Alteration of a plant community?			x			B
c. Adverse effects on any unique, rare, threatened, or endangered species?		x				C
d. Reduction in acreage or productivity of any agricultural land?		x				D
e. Establishment or spread of noxious weeds?		x				E
f. ****For P-R/D-J, will the project affect wetlands, or prime and unique farmland?			x			F
g. Other:						

Table 7. Physical Environment Vegetation.

Vegetation Resource Comments

A. Changes in abundance desirable plant species are an objective of this project. By creating jetties for fish habitat, it is anticipated that a breakwater effect will occur. Combined with selective deepening and shallowing of areas around the jetties, it should provide areas for native aquatic vegetation to grow and provide cover for juvenile fish. Using the removed sediment to recreate the native grassland area of Lake Elmo State Park provides an opportunity to build in some rolling hills and nobs that may enhance diversity of plants that grow in the new area.
B. Alteration of the plant community will occur on the grassland area with an increase in diversity expected as native grass and plant rehabilitate. The plan may include additional native pollinator plants and shrubs in this area.
C. No adverse effects of species of concern, threatened or endangered plant species is expected. *Gratiola ebracteate* http://fieldguide.mt.gov/?elcode=PDSCR0R030 is a plant documented in the township but not at Lake Elmo State Park. It is an obligate for wetland fringe areas and can be found in drying mud environments. It is a G4, S2 and Montana Native Plant Society Threat Category of 3 which is not threatened, or threats are insignificant.
D. No reduction of agricultural land is anticipated.
E. Weeds are managed in the State Park. It is not anticipated that noxious weeds will be spread as part of this project.
F. Wetlands in the project area will be affected. Emergent wetland vegetation will be salvaged from disturbed areas and either replaced and or planted in alternate locations. It is anticipated wetland habitat will be expanded with wild colonization to occur in suitable areas.

D.5 FISH/WILDLIFE

Will the proposed action result in:	**IMPACT ***				**Can Impact Be Mitigated ***	**Comment Index**
	Unknown *	**None**	**Minor ***	**Potentially Significant**		
a. Deterioration of critical fish or wildlife habitat?		x				A
b. Changes in the diversity or abundance of game animals or bird species?			x			B
c. Changes in the diversity or abundance of nongame species?			x			C
d. Introduction of new species into an area?		x				D
e. Creation of a barrier to the migration or movement of animals?		x				E
f. Adverse effects on any unique, rare, threatened, or endangered species?			x			F
g. Increase in conditions that stress wildlife populations or limit abundance (including harassment, legal or illegal harvest or other human activity)?		x				G
			x			H

h. ****For P-R/D-J, will the project be performed in any area in which T&E species are present, and will the project affect any T&E species or their habitat? (Also see 5f)						
i. ***For P-R/D-J, will the project introduce or export any species not presently or historically occurring in the receiving location? (Also see 5d)		x				I
j. Other:						

Table 8. Physical Resource Fish and Wildlife.

Fish and Wildlife Resource Comments

A. Habitats will deteriorate during the draw down as part of this action of this project. Once filled the aquatic habitat will be restored and enhanced. Enhancement of habitat is expected due to diversification of the aquatic habitat and altering the grassland area after placing sediment and fill to enhance the native vegetation habitats. Implementing native pollinator plants is anticipated. The pond isn't critical habitat for threatened or endangered populations of animals or plants.
B. Tiger Muskie currently can be found in the reservoir. They may not be restocked until fish populations mature and recolonization of suckers and carp occurs. Other species present as game fish will be restocked. Lake Elmo State Park does provide resting habitat during late fall and supports migrations of several shoreline and water-based birds. Waterfowl, gulls, and shorebirds may be displaced in the fall of 2021 until May of 2022 if the lake is drained. There are other small lakes and ponds in the area that waterfowl would use.
C. Nongame species use the pond. Those dependent on aquatic conditions will be affected in the short term. Several non-game fish species will be replaced or will naturally colonize the reservoir as a result of irrigation water. Most notably giant floater clams exist in the pond. Investigations to hold and restock some adult giant floater mussels are being conducted as several members of the public are interested in having this population restored. This conversation has been initiated with Montana Natural Heritage Program and David Staglianno. Investigations to hold the limited number of painted and spiny softshell turtles that may be found is also occurring with coordination by Kayhan Ostovar, associate professor at the nearby Rocky Mountain College in Billings. Other invertebrates including insects are expected to recolonize quickly as the system is connected to the ditch and many insects disperse by flying. Draining in the fall and winter with a spring fill will limit loss of use by other terrestrial non-game species.
D. Introduction of species that are not present is not planned as part of the project.
E. Barriers to organisms for migration or movement is not planned as part of the project.
F. Several animal species of concern were reported by the Montana Natural Heritage program. No lasing negative effects to populations of these species is expected.
    F.1 Spotted bat (*Euderma maculatum*) http://fieldguide.mt.gov/?elcode=AMACC07010 This species is ranked G4 S3. It is thought to migrate south in October however evidence is lacking with some individuals potentially wintering in Montana. They are typically found near conifer and sagebrush mixed areas and over open water. No impacts are anticipated due to late season draining.

F.2 Great blue heron (*Ardea Herodias*) http://fieldguide.mt.gov/?elcode=ABNGA04010 This species is ranked G5 S3. Great blue heron have been documented at Lake Elmo, but no nesting sites are present within ¼ mile of Lake Elmo State Park. They utilize the fishery. Short term loss of the fishery will not present a hardship as other ponds and the Yellowstone River are near this area. The pond will be restocked with fish upon refill.

F.3 Greater sage grouse (*Centrocercus urophasianus)* http://fieldguide.mt.gov/?elcode=ABNLC12010 This species is ranked G3G4 S2. It is an upland bird found outside of Billings and Lake Elmo. Sage Grouse do not use this area. The project likely will not affect Sage Grouse populations. The project falls within the exempt community boundary for the City of Billings with a portion of the lake within EO-General Habitat. Consultation with the MT Sage Grouse Habitat Conservation Program will be completed prior to any construction activities. If the sediment removal occurs and sediment can be placed adjacent to the lake this area would be designed to appear and function like a native grassland.

F.4 Pinyon jay (*Gymnorhinus cyanocephalus*) http://fieldguide.mt.gov/?elcode=ABPAV07010 This species is ranked G3 S3. It is a resident bird that nests in ponderosa and limber pine trees. This project will not affect breeding or roosting habitats and therefore will have limited or no effect on individuals.

F.5 Western milksnake (*Lampropeltis gentilis*) http://fieldguide.mt.gov/?elcode=ARADB1905B This species is ranked G5 S2. Milksnakes have been reported in areas of open sagebrush-grassland habitat and ponderosa pine savannah with sandy soils, most often in or near areas of rocky outcrops and hillsides or badland scarps, sometimes within city limits. The project is not expected to affect this species due to timing and location.

F.6 Greater short-horned lizard (*Phrynosoma hernandesi*) http://fieldguide.mt.gov/?elcode=ARACF12080 This species is ranked G5 S3. Although found in areas around Billings this species has not been documented at Lake Elmo State Park. They prefer sun-baked areas with little grass. The project is not expected to affect this species as they are not present in the project area.

F.7 Spiny softshell turtle (*Apalone spinifera)* http://fieldguide.mt.gov/speciesDetail.aspx?elcode=ARAAG01030 This species is ranked G5 S3. Although not reported in the Species of Concern Report from Montana Natural Heritage Project (MTNHP), this species is known to be in Lake Elmo. Investigations to salvage as many spiny softshell turtles are taking place. If a plan is not in place to either find a means to hold them for the winter or temporarily to ensure they are not carrying live clams in their digestive system, they would be left in the pond with potential to migrate out or winterkill during the draining period. Draining will occur as this species begins to find wintering habitat. Loss of individuals will not harm the viability of the species in the region.

F.8 Snapping turtle (*Chelydra serpentine)* http://fieldguide.mt.gov/speciesDetail.aspx?elcode=ARAAB01010 This species is ranked G5 S3. Although not reported in the Species of Concern Report from MTNHP, this species is known to be in Lake Elmo at low densities. If a plan is not in place to either find a means to hold them for the winter or temporarily to ensure they

are not carrying live clams in their digestive system, they would be left in the pond with potential to migrate out or winterkill during the draining period. Draining will occur as this species begins to find wintering habitat. Loss of individuals will not harm the viability of the species in the region.

F.9 Northern leopard frog (*Lithobates pipiens)* http://fieldguide.mt.gov/speciesDetail.aspx?elcode=AAABH01170 This species is ranked G5 S1,S4. Although not reported in the Species of Concern Report from MTNHP, this species is known to be in Lake Elmo at low densities. The S1 designation is for the Mountain West of Montana. The S4 designation if for the Great Plains Region of Montana. Leopard frogs can be found in Lake Elmo, but in low densities. It is anticipated that most frogs in the lake when it drains will either migrate to more suitable habitat or perish. It is likely they will recolonize Lake Elmo particularly if emergent wetlands are improved as anticipated as a result of this project.

F.10 Yellowstone cutthroat trout (*Oncorhynchus clarkia bouvieri*) http://fieldguide.mt.gov/?elcode=AFCHA02087 This species is ranked G5T4 S2. This species is present in Lake Elmo through the FWP stocking program and does not naturally reproduce in Lake Elmo or associated ditches. This species will continue to be stocked as a put-and-take fishery after the project is completed. This project will not affect wild populations of Yellowstone cutthroat trout.

G. Implementation of no harvest limits would be intended to increase use of fish for human consumption but would reduce populations of fish prior to draining. Draining will remove the existing fishery. Stocking will restore populations of desirable species. Less desirable species such as suckers and carp are anticipated to recolonize with access through the irrigation system. Temporarily, the removal of carp and suckers will result in more available resources for the stocked fish as they colonize Lake Elmo.

H. No threatened or endangered species will be impacted at a population level. The loss of some individual spiny softshell turtles (*Apalone spinifera* G5S3*)*, snapping turtles (*Chelydra serpentine* G5S3*)* and northern leopard frogs (*Lithobates pipiens* G5 S1 Western MT,S4 Great Plains*)* may occur. Alternatives to capture turtles to hold them over winter or hold them long enough to ensure they do not pass invasive clams that may be in their digestive systems are being considered. The loss of individuals in Lake Elmo will not affect overall populations of turtles in this area. Although not listed by the MTNHP, these species have been documented in Lake Elmo. Species of concern birds and bats that use Lake Elmo are typically migrating out of Montana, will have migrated or have the ability to use other ponds and the Yellowstone River riparian and river as alternate areas.

I. All species known in Lake Elmo except for *Corbicula Fluminea* are expected to be present in area ponds, streams and rivers. The goal of the project is to eliminate *Corbicula Fluminea* before it can spread. Surveys by AIS department indicate they are limited to Lake Elmo. Project actions are not expected to increase potential for them to be spread out. Draining the lake in the fall outside of the spawning period will reduce potential of clams being pulled out with the water. The ditch will be drained, dried, and frozen in the winter and any clams that may make it into the ditch should be caught up in low areas and deposited in slow areas resulting in mortality for any clams in the ditch. Evaluation of a screen system to reduce passage of clams is being considered and may be implemented if feasible and necessary.

D.6 HUMAN ENVIRONMENT NOISE/ELECTRICAL EFFECTS

Will the proposed action result in:	IMPACT *				Can Impact Be Mitigated *	Comment Index
	Unknown *	None	Minor *	Potentially Significant		
a. Increases in existing noise levels?			x			A
b. Exposure of people to serve or nuisance noise levels?			x			B
c. Creation of electrostatic or electromagnetic effects that could be detrimental to human health or property?		x				C
d. Interference with radio or television reception and operation?		x				D
e. Other:						

Table 9. Human Environment Noise and Electrical Effects.

A. Heavy equipment will be used for this project. Increased truck traffic and excavator work during normal working hours may increase noise levels similar to home building or other construction projects. The project periods with active equipment use will be short term.
B. Exposure to severe noise is not anticipated, however nuisance noise may occur during brief portions of the project period particularly from October 2021 to April 2022. Work likely will be limited or halt from mid-December to late-February due to frozen soils.
C. No changes in electrostatic or electromagnetic effects are anticipated as a result of this project.
D. No interference of radio or television reception is anticipated as a result of this project.

D.7 LAND USE

Will the proposed action result in:	IMPACT *				Can Impact Be Mitigated *	Comment Index
	Unknown *	None	Minor *	Potentially Significant		
a. Alteration of or interference with the productivity or profitability of the existing land use of an area?		x				A
b. Conflicted with a designated natural area or area of unusual scientific or educational importance?		x				B
c. Conflict with any existing land use whose presence would constrain or potentially prohibit the proposed action?		x				C
d. Adverse effects on or relocation of residences?		x				D
e. Other:						E

Table 10. Human Environment Land Use

A. No change is anticipated to interfere with productivity or profitability of existing land in the area. Lake Elmo State Park is an established, heavily used state park. Improvements will not expand capacity but will improve the experience for park visitors.
B. No conflict with designated natural areas or areas of unusual scientific or education importance is expected. Improvements may improve angler and aquatic ed programs and park programs. The grasslands, while not a designated area, may see improvement and allow for planned landscaping to diversify habitat for the grassland area.
C. Conflict with existing land uses whose presence would constrain or prohibit the proposed action is not anticipated.
D. This project will not require relocation of any residences.

D.8 RISK/HEALTH HAZARDS

Will the proposed action result in:	IMPACT *				Can Impact Be Mitigated *	Comment Index
	Unknown *	None	Minor *	Potentially Significant		
a. Risk of an explosion or release of hazardous substances (including, but not limited to oil, pesticides, chemicals, or radiation) in the event of an accident or other forms of disruption?		x				A
b. Affect an existing emergency response or emergency evacuation plan or create a need for a new plan?		x				B
c. Creation of any human health hazard or potential hazard?		x				C
d. ***For P-R/D-J, will any chemical toxicants be used? (Also see 8a)		x				D
e. Other:						E

Table 11. Human Environment Risk and Health Hazards.

A. No risk of explosion or release of hazardous substances beyond typical earth moving construction is anticipated. BMP's for maintaining equipment to reduce risk of hydraulic fluid, oil and fuel leaks will be in place.
B. No effect on an existing emergency response plan is anticipated. The lakebed will be a restricted area during full drawdown to exclude public from getting stuck in muddy sediments. Law enforcement and emergency response crews will be aware of changing conditions at Lake Elmo.
C. Exposing the lakebed and subsequent mud may create an attractive nuisance. Park staff intend to sign and post no access during the full drawdown to inform the public of the hazards and to restrict access. If the project moves forward an assessment of sediment chemistry will be completed with a determination of suitability for excavation and use as soil in the park.
D. Chemical toxicants are not planned to be used at this time. It is anticipated the reservoir can be drawn down to sufficiently to dry and freeze the lakebed enough to eliminate *Corbicula fluminea.* If the reservoir cannot be drawn down fully with gravity and or pumping and the risk of the clams surviving the drawdown is considered high, the use of other chemical or

mechanical treatments will be considered. A supplemental plan and EA for use of chemicals would be provided to the public for input and comment. This EA may result with some providing removal alternatives that FWP was not aware of or may provide input to help create a supplemental plan if necessary.

E.

D.9 COMMUNITY IMPACT

Will the proposed action result in:	IMPACT *				Can Impact Be Mitigated *	Comment Index
	Unknown *	None	Minor *	Potentially Significant		
a. Alteration of the location, distribution, density, or growth rate of the human population of an area?		x				A
b. Alteration of the social structure of a community?		x				B
c. Alteration of the level or distribution of employment or community or personal income?			x			C
d. Changes in industrial or commercial activity?		x				D
e. Increased traffic hazards or effects on existing transportation facilities or patterns of movement of people and goods?			x			E
f. Other:						F

Table 12. Human Environment Community Impact.

A. No alteration of the location, distribution, density, or growth rate of human populations in the area is anticipated.
B. No change to social structure is anticipated.
C. Minor alteration of the level or distribution of employment is anticipated. This project will require private contractors and associated economic benefits creating opportunity for employment. This would last for the duration of the project and expected to be short term with limited number of contractors.
D. No changes in industrial or commercial activity would result from this project other than short term employment of contracted services.
E. Movement of equipment into and out of the project area may create limited increased traffic of trucks and equipment necessary to import and export materials necessary to complete the project. This is anticipated to be limited to partial and full draw down periods.

D.10 PUBLIC SERVICES/TAXES/UTILITIES

Will the proposed action result in:	IMPACT *				Can Impact Be Mitigated *	Comment Index
	Unknown *	None	Minor *	Potentially Significant		
a. Will the proposed action have an effect upon or result in a need for new or altered governmental services in any of the following areas: fire or police protection, schools, parks/recreational facilities, roads or other public maintenance, water supply, sewer or septic systems, solid waste disposal, health, or other governmental services? If any, specify:		x				A
b. Will the proposed action have an effect upon the local or state tax base and revenues?		x				B
c. Will the proposed action result in a need for new facilities or substantial alterations of any of the following utilities: electric power, natural gas, other fuel supply or distribution systems, or communications?		x				C
d. Will the proposed action result in increased use of any energy source?			x			D
e. **Define projected revenue sources						E
f. **Define projected maintenance costs.						F
g. Other:						

Table 13. Human Environment Public Services, Taxes, Utilities.

A. No new government services will be required. Existing staff from FWP will oversee the project. Construction work would be completed largely through contracted services.
B. This project will not alter the local or state tax rates.
C. No need for new facilities or major changes to existing utility facilities will occur as part of the project.
D. The increased energy demand, most of which will be fuel, will be short term using heavy equipment.
E. Project funding is anticipated to come from FWP programs such as Fisheries and Parks plus grants that may be federal, state, local and private.
F. Maintenance costs for new jetty surfaces, picnic tables and boardwalks will be included in the current Parks program.

D.11 AESTHETICS/RECREATION

Will the proposed action result in:	IMPACT *				Can Impact Be Mitigated *	Comment Index
	Unknown *	None	Minor *	Potentially Significant		
a. Alteration of any scenic vista or creation of an aesthetically offensive site or effect that is open to public view?			x			A
b. Alteration of the aesthetic character of a community or neighborhood?			x			B
c. **Alteration of the quality or quantity of recreational/tourism opportunities and settings? (Attach Tourism Report)			x			C
d. ***For P-R/D-J, will any designated or proposed wild or scenic rivers, trails or wilderness areas be impacted? (Also see 11a, 11c)		x				D
e. Other:						

Table 14. Human Environment Aesthetics and Recreation.

A. Currently Lake Elmo offers a scenic view of a lake with water. During project implementation of the full draw down the view will be reduced to a lakebed with construction equipment at the site. Placement of materials and removal and place of sediment will not provide the same view as a full lake. This alteration will be short term and after the project is completed will return the view expected of a full lake.
B. As Lake Elmo is a large part of the local community, any draw down and construction temporarily would change the aesthetics of the surrounding area. Once the project is completed, the aesthetic character will be returned and improved.
C. Use of the lake will be restricted during the full draw down, which will eliminate ice fishing in the 2021/2022 winter season. This is a popular ice fishing area. Other opportunities are available in the Billings area but will require those who used Lake Elmo exclusively to temporarily travel to other locations or not ice fish in 2021/2022 winter. Other uses include ice skating and cross-country skiing under certain conditions. All activities outside of construction work would be restricted during the full draw down period.
D. This project will not affect a designated or proposed wild and scenic river, trail or wilderness area.

D.12 CULTURAL/HISTORICAL RESOURCES

Will the proposed action result in:	IMPACT *				Can Impact Be Mitigated *	Comment Index
	Unknown *	None	Minor *	Potentially Significant		
a. **Destruction or alteration of any site, structure or object of prehistoric historic, or paleontological importance?		x				A
b. Physical change that would affect unique cultural values?		x				B
c. Effects on existing religious or sacred uses of a site or area?		x				C
d. ****For P-R/D-J, will the project affect historic or cultural resources? Attach SHPO letter of clearance. (Also see 12.a)		x				D
e. Other:						

Table 15. Human Environment Cultural and Historical Resources.

A. Lake Elmo is a reservoir that modified the original natural site. All work will occur in the area of Lake Elmo and not destroy or alter any prehistoric or paleontological resources. Excavation of the lakebed would be limited to removal of sediment to partially restore historic depth of the reservoir in select locations. If the project moves forward SHPO will be contacted for review and mitigation measures if necessary.
B. Physical changes will not change cultural values.
C. No effect to existing or religious or sacred sites is anticipated as a result of this project.
D. No change to historic or cultural resources will occur. The current lakebed and shoreline have been changing annually with erosion and deposition. This project will work within the footprint of the original Lake Elmo.

E. SIGNIFICANCE CRITERIA

E.1 SUMMARY EVALUATION OF SIGNIFICANCE

Will the proposed action, considered as a whole:	IMPACT *				Can Impact Be Mitigated *	Comment Index
	Unknown *	None	Minor *	Potentially Significant		
a. Have impacts that are individually limited, but cumulatively considerable? (A project or program may result in impacts on two or more separate resources that create a significant effect when considered together or in total.)			x			A
b. Involve potential risks or adverse effects which are uncertain but extremely hazardous if they were to occur?		x				B
c. Potentially conflict with the substantive requirements of any local, state, or federal law, regulation, standard or formal plan?		x				C
d. Establish a precedent or likelihood that future actions with significant environmental impacts will be proposed?		x				D
e. Generate substantial debate or controversy about the nature of the impacts that would be created?			x			E
f. ***For P-R/D-J, is the project expected to have organized opposition or generate substantial public controversy? (Also see 13e)			x			F
g. ****For P-R/D-J, list any federal or state permits required.						G

Table 16. Summary Evaluation of Significance.

A. This project proposes to eliminate *Corbicula fluminea*, which, in Montana, currently are only known to exist in Lake Elmo. Under the do-nothing alternative, the continued possibility of human or natural spread exists. Actively draining the lake does present the risk of sending individual clams into the irrigation system and downstream. Clams are restricted to the bottom of the lake except during a short period of dispersal as juveniles when they can be suspended and connect by byssal threads to floating materials that could allow them to disperse in the ditch. The dispersal occurs in the summer when the clams reproduce. Draining the lake in the fall is outside of spawning times, which should minimize or eliminate dispersal. It is unlikely that a clam would move through the ditch and not be exposed to desiccation and freezing or would disperse to a potential downstream private pond or the irrigation return to Five Mile Creek. If the project did transport clams, implications for downstream water users could result in increased maintenance and operational costs. This could occur if no action is taken. By actively attempting to eliminate the clams, the risk is reduced for downstream users. The fisheries and park improvement projects do not present cumulative or individual risks described in A.

B. The potential risk of spreading clams while attempting to eliminate them is unknown with timing in place to prevent known pathways for clams to migrate. Expansion of the population without attempting to remove them presents the same and continued risk. The fisheries and park improvements do not involve adverse or extremely hazardous risks.
C. Removal of the *Corbicula fluminea* population in Lake Elmo follows state plans and objectives to manage invasive species. Unintentionally spreading the clams because of the project would conflict with planning and management of public and private utilities i.e. water intakes. No-action allows the threat of expansion to continue, leading to the same result of working to manage issues created by presence of *Corbicula fluminea.*
D. Control measures in the Yellowstone and Missouri River systems are not available. Treatment at intake facilities require the use of chemical and mechanical removal which may cause other environmental impacts. This is most likely to occur if no action is taken and greatly reduced if the action to remove is accepted.
E. If *Corbicula fluminea* is determined to be spread by FWP actions to remove the population from Lake Elmo, it is likely that the actions of the project would be debated in the press and by other state and federal agencies, private organizations and individuals. There are individuals who believe control of *Corbicula fluminea* is unnecessary as they present limited concern to them. Others believe the action is too harsh because it requires the loss of the existing fishery with impacts to individual aquatic organisms which currently exist in Lake Elmo. Some consider the actions and use of heavy equipment may create locally unpleasant conditions. Scoping found considerable support for the project, indicating that many believe the consequences of the actions are acceptable to reach the goal of a *Corbicula fluminea*-free environment with improved habitat and access at Lake Elmo.
F. This project is not expected to generate organized opposition. Several organizations and boards have demonstrated support through financial commitment to help the project move forward. Some may be opposed to removal of living organisms including the fishery, turtles, mussels, and invasive clams. Others may not support the use of funds to address invasive clams. Scoping results strongly supported removal, habitat and access improvements.
G. Permit requirements are being investigated. Permits that may be required are 404, 401, 124, and 318. The permits would be for disturbance of any wetlands and placing fill in the reservoir as part of the jetty and node projects. Other permits through DEQ may be required such as a discharge permit. Since discharge will be within the limits of the water rights and traditional operations of the project, it is not anticipated to generate excessive sediment or change to water chemistry.

E.2 Description and Analysis of Reasonable Alternatives

E.2.1 No action

The no-action alternative is not considered as a viable alternative. *Corbicula Fluminea* is described as one of the most invasive species in American and European freshwater systems(Sousa, Antunes, Guilhermino 2008). The USGS Nonindigenous Aquatic Species website for *Corbicula fluminea* https://nas.er.usgs.gov/queries/factsheet.aspx?speciesid=92 reports, "The most prominent effect of the introduction of the Asian clam into the United States has been biofouling, especially of complex power plant and industrial water systems (Isom et al. 1986; Williams and McMahon 1986). It has also been documented to cause problems in

irrigation canals and pipes (Prokopovich and Hebert 1965; Devick 1991) and drinking water supplies (Smith et al. 1979). It also alters benthic substrates (Sickel 1986) and competes with native species for limited resources (Devick 1991)."

The State of Montana developed the 2016 Montana Invasive Species Framework (MISAC 2016), which outlines the desire to prevent transport of invasive species, improve detection and rapidly respond to emerging invasive species and develop control options. Not responding to the known population of *Corbicula fluminea* would not follow the directives to address invasive species presence. As Lake Elmo is the only known population of *Corbicula fluminea* in Montana, this proposed action has the potential to remove this threat from Montana waters and from spreading the species downstream in the Yellowstone River and ultimately the Missouri River in North Dakota. Nebraska already has a population that is not controlled and has cost millions of dollars to repair and protect infrastructure along the Missouri River. A lengthy discussion for risk assessment was undertaken as part of the decision to combine efforts with *Corbicula fluminea* management and implementing improvements to the fisheries and park programs Although the AIS team wanted immediate action to control and remove the threat in 2019, the Billings Bench Irrigation District was not prepared to drain the reservoir on such short notice. However, because of the low densities of live clams, no action in 2019 was deemed acceptable. An additional factor that went into not draining the reservoir in 2019 was that the clams were not found in other portions of the Billings Bench irrigation system.

To manage the risk in 2020, the partial drawdown has been implemented and will provide time for staff to scope, conduct an EA and, if the decision to move forward is made, time to finalize plans, find funding, create bid packages, award contracts and implement elements.

E.2.2 Mange Park and Lake Access to Control Invasive *Corbicula fluminea*

In situations where eradication is not possible, control and management of *Corbicula fluminea* or other invasive species alternatives has been regularly implemented at other waterbodies. Changes in rules for Canyon Ferry and Tiber Reservoirs after the potential discovery of Zebra Mussels and Fort Peck reservoir and other waters found with Eurasian milfoil are examples of potential actions.

This alternative was not fully considered as the potential to eradicate *Corbicula fluminea* in Lake Elmo appears feasible and allows for in-reservoir and area improvements proposed by the Fisheries and Parks Divisions. Eradication projects are challenging and understanding that single individuals can start a population is disconcerting. Understanding that *Corbicula fluminea* have been present long enough to have adult and juvenile specimens in Lake Elmo also means populations beyond Lake Elmo may exist at low and undetectable densities at this time. If populations are found outside of Lake Elmo, this likely would have been the preferred alternative with a combination of regular partial drawdowns to reduce densities and slow expansion.

Within this alternative, many private and public lake managers for other waterbodies have reduced risk by closing or reducing access. Managers often require facilities to increase cleaning of any potential carriers for the clams, including boats, beach toys, fishing gear etc., that could move the invasive population away from an infected waterbody. The Park Division already has denied special permits for after-hour fishing to manage potential movement of *Corbicula fluminea.* Mandatory cleaning stations for boats and water and beach-based toys would be inconvenient as so many visitors use Lake Elmo. Multiple cleaning stations and various types of

stations would need to be constructed and placed requiring continued maintenance as part of this alternative. One option would be to prohibit watercraft. This alternative would reduce the risk of spreading *Corbicula fluminea* but decrease use at Lake Elmo, increase visitor frustration and increase the need for enforcement to keep watercraft off the water. This would be counter to the management of Lake Elmo State Park.

If the proposed alternative to eradicate *Corbicula fluminea* is accepted but ultimately fails to remove the population, FWP will need to revisit this alternative in the future. If the current preferred alternative fails to be accepted, this alternative will be revisited and more thoroughly analyzed, followed by an additional environmental assessment.

Under this option many elements in the Fisheries and Parks program would still be considered as there is strong support to implement many of these proposals. Some of the elements such as sediment excavation would be dropped from consideration. The ability for FWP to implement any or all elements will be contingent on securing funding.

E.2.3 Drain, Dry, Freeze to Remove *Corbicula fluminea* Population and Implement Fisheries and Park Projects

This alternative is the preferred alternative presented in this document. The short-term disruption of the aquatic environment to focus removal of *Corbicula fluminea* within the basin is preferred rather than attempt to create a chemical removal plan. Chemical removal would likely result in loss of more biota than a drying event with implications for down system effects. Many organisms in the great plains have adaptations to drought events either by surviving in sediments in various life stages or colonizing from other areas. Terrestrial biota disruption will be limited to loss of the area for a season, particularly for waterfowl. Physical collection or non-chemical treatments have not been successful actions to remove populations of Corbicula *fluminea* from other waterbodies. The cost to ramp up containment and management at Lake Elmo State Park with staff and equipment would likely be costly and overtime cost more than the proposed improvements. This opportunity could remove an invasive species in Montana and result in a more desirable fishery and state park.

Several simple factors are considered in both the Fisheries and Parks elements. It would be easy to not move forward and enhance Lake Elmo State Park and the fishery habitat. Staff at FWP attempt to provide quality experiences and manage and protect fish and wildlife habitat. If the alternative to remove *Corbicula fluminea* is accepted, this would be the opportunity to maximize work in the reservoir to improve conditions for elements that could be built more efficiently in a dry or exposed environment. Rather than propose draining or partial draw downs in the future for individual fisheries or parks projects, it was determined that plans should be coordinated between the AIS Bureau and Fish and Parks Divisions to create a comprehensive approach.

Financial support from grants for fisheries and access alternatives has been secured to fund portions of the work if approved. More fundraising is necessary to meet the full objectives as proposed. Support from the public through fund raising, organizing volunteers, and in-kind donations will likely be required for the full project to be completed. If an element cannot be completed due to lack of funding or ability to implement, other elements may be expanded.

This Environmental Assessment is in place to gather input for elements as well as to gather input on concerns or support for various elements and actions. Please consider this your opportunity to provide additional ideas that may not be represented in this document.

F. EVALUATION AND LISTING OF MITIGATION, STIPULATION OR OTHER CONTROL MEASURES ENFORCEABLE BY THE AGENCY OR OTHER GOVERNMENT AGENCY

Construction projects would follow Best Management Practices to limit issues raised in the EA. Stipulations provided in the permitting process would follow the most restrictive recommendations to ensure all permit requirements would be met. Coordination with permitting agencies and the irrigation district will be crucial to ensure the project is successful with the least amount of environmental short-term concerns. Long term effects for the environment, habitat, and human use are anticipated to improve.

G. NARRATIVE EVALUATION AND COMMENT

The proposed actions would remove the need to manage *Corbicula Fluminea into the future*, improve fisheries habitat and improve visitor experience and safety. Short-term inconvenience and challenges of construction and renovation projects in urban areas are expected to occur. Similar projects have resulted in expected improvements that will last for decades.

Development projects all require maintenance or are abandoned at some point. Lake Elmo was developed to support irrigation and ultimately recreation as a result of the McCracken family's vision with the name Elmo derived from their grandfather. Increased urban development has covered much of the irrigated fields reducing the need for full irrigation. Increased urbanization of Billings and the surrounding area has increased visitation of Lake Elmo State Park. Proposed efforts will be an investment in the future of this well-used and loved recreational site. Removing *Corbicula Fluminea* is important as many people use Lake Elmo and other water bodies.

An outcome of the EA process may be "don't drain Lake Elmo." In that case, FWP would need to create a plan to control expansion of *Corbicula Fluminea*, to the best of their and the public's ability. The investment in Lake Elmo could move forward in part.

An additional outcome may be no action in any category - removal, fish habitat or access and amenities. Planning for fisheries and parks improvements would cease or be reduced with FWP still in need of creating a management plan for control of *Corbicula Fluminea* in Lake Elmo and the state.

H. EA CONCLUSION SECTION

1. Based on the significance criteria evaluated in this EA, is an environmental impact statement (EIS) required (YES/NO)?

No. The evaluation of impacts to the Physical and Human Environments under MEPA guidelines in this document revealed no significant negative impacts from the proposed actions. Conversely, the removal of *Corbicula Fluminea* would reduce the threat of this species expansion in a large geographic area. The lack of significant negative effects precludes the need for an EIS-level analysis.

2. Describe the level of public involvement for this project if any and, given the complexity and the seriousness of the environmental issues associated with the proposed action, is the level of public involvement appropriate under the circumstances?

A public scoping survey was conducted from March 1, 2020, through March 17, 2020. In the absence of a public meeting an informational video was available to the public to review, https://www.youtube.com/watch?v=pmZXc1TYBsc. It was available on several social media platforms and YouTube. The virtual public meeting received thousands of views across the platforms. Survey results indicated strong support for the recommend alternatives in this document (Appendix K.3).

In meetings with angler groups from Billings and outlying areas to discuss the issue and potential for improvement work the groups provided both verbal and financial support. Future Fisheries and Community Pond grant funds have been secured with those boards supporting the effort.

- Legal notices will be published in the Billings Gazette and Independent Record (Helena).
- Public notice will be posted on FWP's website and the draft EA will be available electronically.
- Copies of this draft EA may be obtained by mail from MTFWP, 2300 Lake Elmo Drive, Billings, MT 59230 or by phoning 406-247-2940

3. Duration of comment period will be 33 days. Comments are due by 5 pm of the closing day. If substantial comment is received a public meeting may be held via an electronic format or other acceptable format with a minimum of a 15-day extension of the comment period.

Comment period will be October 16, 2020 to November 18, 2020, 5:00 pm.

Written comments can be mailed to:
Mike Ruggles
Montana Fish Wildlife and Parks
2300 Lake Elmo Drive
Billings, MT 59105.
Emailed comments can be sent to
fwpregion5pc@mt.gov
Phone comments can be directed to 406-247-2961.

4. Name, title, address and phone number of the person(s) responsible for preparing the EA:

   Mike Ruggles, Regional Fisheries Manager, 2300 Lake Elmo Drive Billings, MT 59105. 406-247-2961. mikeruggles@mt.gov
   Bob Gibson, Regional Communication and Education Program Manager, 2300 Lake Elmo Drive Billings, MT 59105. 406-247-2950.
   Terri Walters, Regional Parks Manager, 2300 Lake Elmo Drive, Billings, MT 59105. 406-247-2955.
   Barb Beck, Region 5 Regional Manager, 2300 Lake Elmo Drive Billings, MT 59105. 406-247-2951.
   Thomas Woolf, Aquatic Invasive Species Bureau Chief, P.O. Box 200701, Helena, MT 59620-0701. 406-444-1230.
   Shannon Blackburn, Fisheries Biologist, 2300 Lake Elmo Drive Billings, MT 59105. 406-247-2963.
   Craig McLane, AIS Early Detection & Monitoring Coordinator, P.O. Box 200701, Helena, MT 59620-0701. 406-444-1224

I. PRIVATE PROPERTY ASSESSMENT ACT CHECKLIST

The 54th Legislature enacted the Private Property Assessment Act, Chapter 462, Laws of Montana (1995). The intent of the legislation is to establish an orderly and consistent process by which state agencies evaluate their proposed actions under the "Takings Clauses" of the United States and Montana Constitutions. The Takings Clause of the Fifth Amendment of the United States Constitution provides: "nor shall private property be taken for public use, without just compensation." Similarly, Article II, Section 29 of the Montana Constitution provides: "Private property shall not be taken or damaged for public use without just compensation..."

The Private Property Assessment Act applies to proposed agency actions pertaining to land or water management or to some other environmental matter that, if adopted and enforced without compensation, would constitute a deprivation of private property in violation of the United States or Montana Constitutions.

The Montana State Attorney General's Office has developed guidelines for use by state agency to assess the impact of a proposed agency action on private property. The assessment process includes a careful review of all issues identified in the Attorney General's guidance document (Montana Department of Justice 1997). If the use of the guidelines and checklist indicates that a proposed agency action has taking or damaging implications, the agency must prepare an impact assessment in accordance with Section 5 of the Private Property Assessment Act. For the purposes of this EA, the questions on the following checklist refer to the following required stipulation(s):

DOES THE PROPOSED AGENCY ACTION HAVE TAKINGS IMPLICATIONS UNDER THE PRIVATE PROPERTY ASSESSMENT ACT?

YES	NO		
	NO	1.	Does the action pertain to land or water management or environmental regulation affecting private real property or water rights?
	NO	2.	Does the action result in either a permanent or indefinite physical occupation of private property?
	NO	3.	Does the action deprive the owner of all economically viable uses of the property?
	NO	4.	Does the action deny a fundamental attribute of ownership?
	NO	5.	Does the action require a property owner to dedicate a portion of property or to grant an easement? [If the answer is **NO**, skip questions 5a and 5b and continue with question 6.]
		5a.	Is there a reasonable, specific connection between the government requirement and legitimate state interests?
		5b.	Is the government requirement roughly proportional to the impact of the proposed use of the property?
	NO	6.	Does the action have a severe impact on the value of the property?
	NO	7.	Does the action damage the property by causing some physical disturbance with respect to the property in excess of that sustained by the public generally? [If the answer is **NO**, do not answer questions 7a-7c.]
	NO	7a.	Is the impact of government action direct, peculiar, and significant?
	NO	7b.	Has government action resulted in the property becoming practically inaccessible, waterlogged, or flooded?
	NO	7c.	Has government action diminished property values by more than 30% and necessitated the physical taking of adjacent property or property across a public way from the property in question?

J. Literature Cited:

Barenberg, A., and C. M. Moffitt 2018. Toxicity of Aqueous Alkaline Solutions to New Zealand Mudsnails, Asian Clams, and Quagga Mussels. Journal of Fish and Wildlife Management9: 14–24.

Devick, W. S. 1991. Patterns of introductions of aquatic organisms to Hawaiian freshwater habitats. Pages 189-213 *in* New Directions in Research, Management and Conservation of Hawaiian Freshwater Stream Ecosystem. Proceedings Freshwater Stream Biology and Fisheries Management Symposium. Department of Land and Natural Resources, Division of Aquatic Resources, Honolulu, HI.

Isom, B. G., C. F. Bowman, J. T. Johnson, and E. B. Rodgers. 1986. Controlling Corbicula (Asiatic clams) in complex power plant and industrial water systems. American Malacological Bulletin, Special Edition 2:95–98.

Matthews, M. A., McMahon R. F. 1999. Effects of temperature and temperature acclimation on survival of zebra mussels (Dreissena polymorpha) and Asian clams (Corbicula fluminea) under extreme hypoxia. Journal of Molluscan Studies 65:317–325.

MISAC, Montana Invasive Species Advisory Council 2016. http://dnrc.mt.gov/divisions/cardd/docs/misac-docs/misac-resources-docs/MISSF-v1-5-optimized-size.pdf

Prokopovich, N. P., and D. J. Hebert. 1965. Sedimentation in the Delta-Mendota Canal. Journal of the American Water Works Association 57:375–382.

Sickel, J. B. 1986. Corbicula population mortalities: factors influencing population control. American Malacological Bulletin, Special Edition 2:89-94.

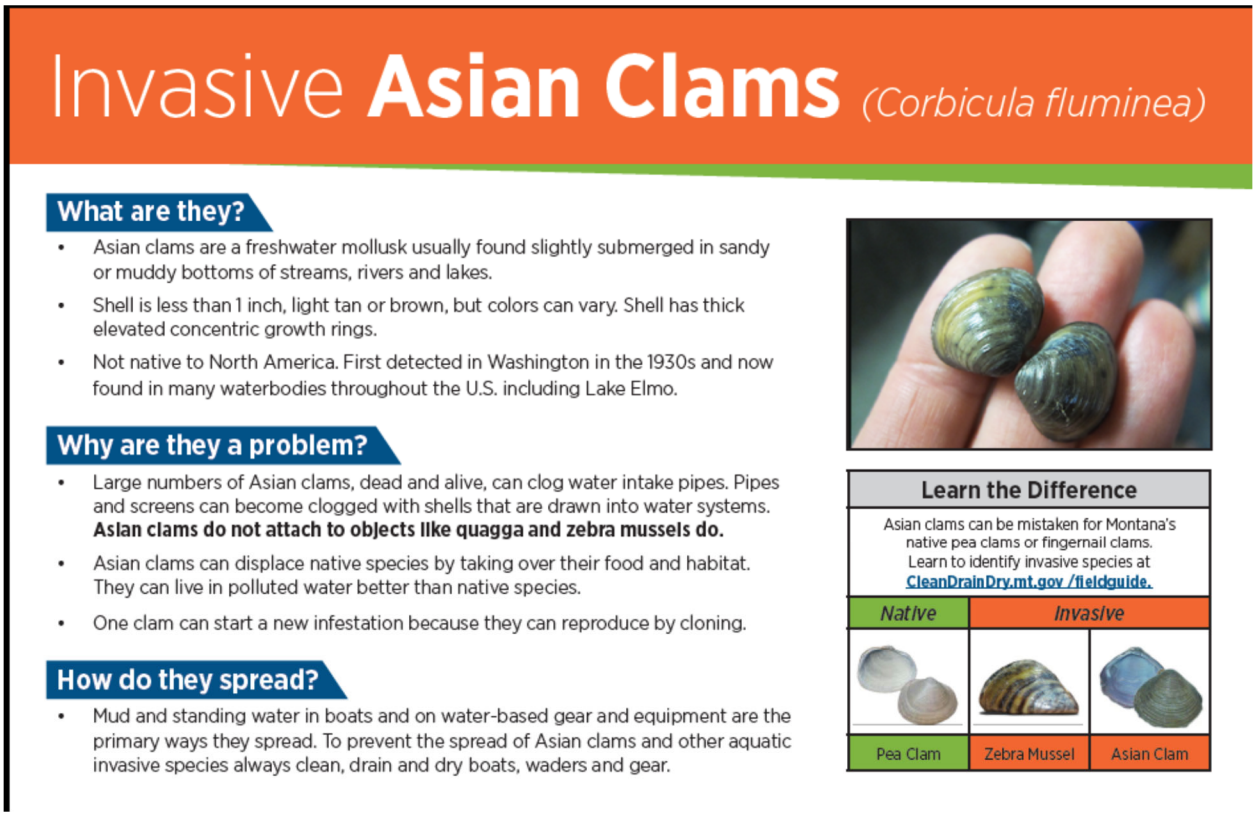
Smith, A. L., A. Mula, J. P. Farkas, and D. O. Bassett. 1979. Clams - a growing threat to inplant water systems. Plant Engineering 1979:165–167.

Sousa, R., C. Antunes, , L. Guilhermin. 2008. Ecology of the invasive Asian clam Corbicula fluminea (Müller, 1774) in aquatic ecosystems: an overview. Annales de Limnologie - International Journal of Limnology,44, 85–94.

Williams, C. J., and R. F. McMahon. 1986. Power station entrainment of Corbicula fluminea (Müller) in relation to population dynamics, reproductive cycle and biotic and abiotic variables. American Malacological Bulletin, Special Edition 2:99–111.

K. Appendix

K.1 Irrigation Post Card



Invasive **Asian Clams** *(Corbicula fluminea)*

What are they?

- Asian clams are a freshwater mollusk usually found slightly submerged in sandy or muddy bottoms of streams, rivers and lakes.
- Shell is less than 1 inch, light tan or brown, but colors can vary. Shell has thick elevated concentric growth rings.
- Not native to North America. First detected in Washington in the 1930s and now found in many waterbodies throughout the U.S. including Lake Elmo.

Why are they a problem?

- Large numbers of Asian clams, dead and alive, can clog water intake pipes. Pipes and screens can become clogged with shells that are drawn into water systems. **Asian clams do not attach to objects like quagga and zebra mussels do.**
- Asian clams can displace native species by taking over their food and habitat. They can live in polluted water better than native species.
- One clam can start a new infestation because they can reproduce by cloning.

How do they spread?

- Mud and standing water in boats and on water-based gear and equipment are the primary ways they spread. To prevent the spread of Asian clams and other aquatic invasive species always clean, drain and dry boats, waders and gear.

Learn the Difference

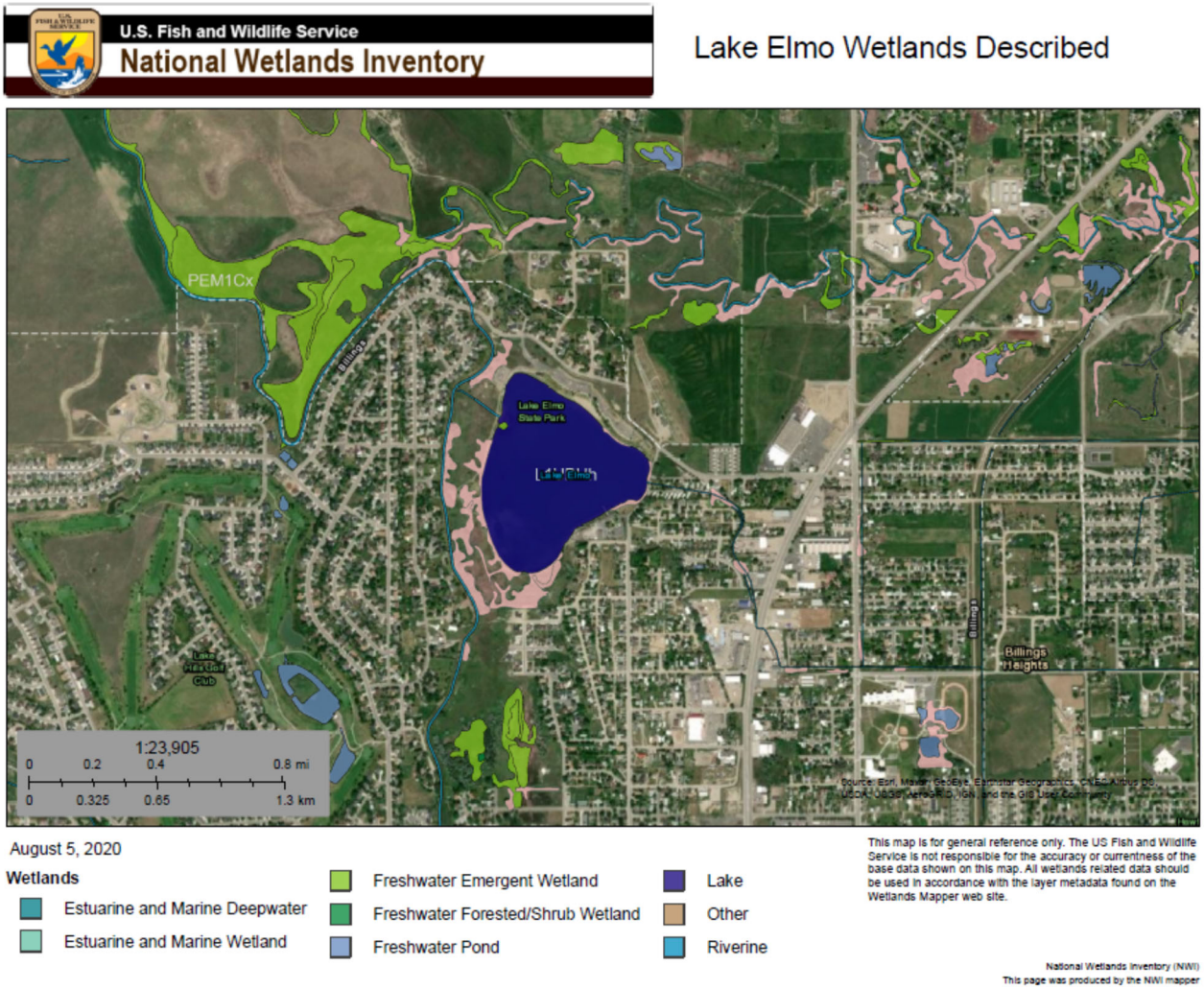
Asian clams can be mistaken for Montana's native pea clams or fingernail clams. Learn to identify invasive species at CleanDrainDry.mt.gov /fieldguide.

Native	Invasive	
Pea Clam	Zebra Mussel	Asian Clam

Figure 8. Post Card for Irrigation District Members Mailed Winter 2019/2020.

K.2 Wetland Inventory Map

J.2 Wetlands Inventory



K.3 Charts and Tables of Survey Results Public Scoping May 1 through May 17, 2020

Figure 9. Public Scoping Title slide.

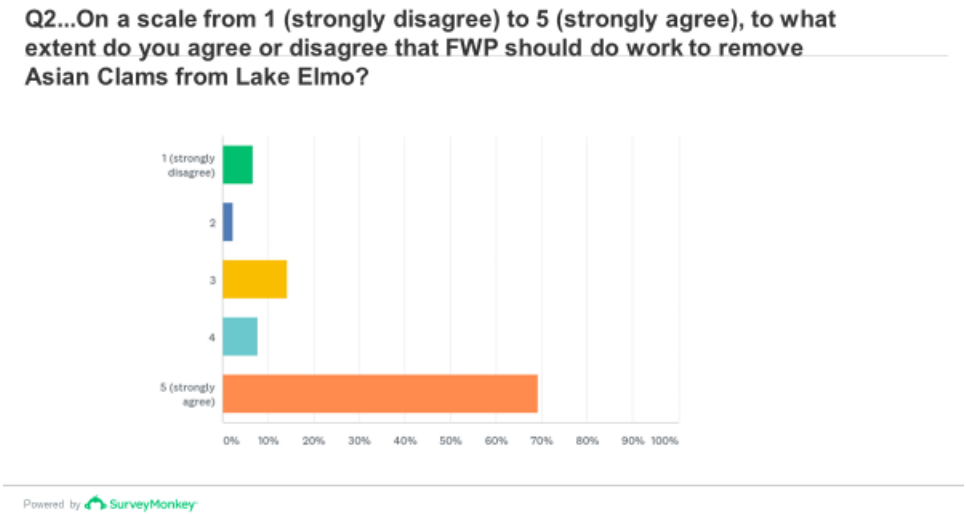


Figure 10. Public Scoping Question 2, Asian Clam Removal Chart.

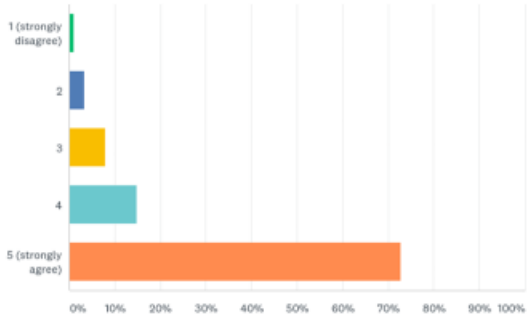
Q2...On a scale from 1 (strongly disagree) to 5 (strongly agree), to what extent do you agree or disagree that FWP should do work to remove Asian Clams from Lake Elmo?

ANSWER CHOICES	RESPONSES	
1 (strongly disagree)	6.59%	6
2	2.20%	2
3	14.29%	13
4	7.69%	7
5 (strongly agree)	69.23%	63
TOTAL		91

Powered by SurveyMonkey

Figure 11. Public Survey Q2, extent of agree or disagree to remove Asian Clams Table.

Q3...If work was done to remove Asian Clams, there would be an opportunity for FWP to do additional work to help improve aquatic fish habitat within Lake Elmo (e.g., increase the depth of the lake, improve aquatic vegetation, install gravel/rock jetty areas, create a sediment retention area, etc.). On a scale from 1 (strongly disagree) to 5 (strongly agree), to what extent do you agree or disagree FWP should do additional work to help improve aquatic fish habitat within Lake Elmo?



Powered by SurveyMonkey

Figure 12. Public Survey Q3 Fisheries Improvement Chart.

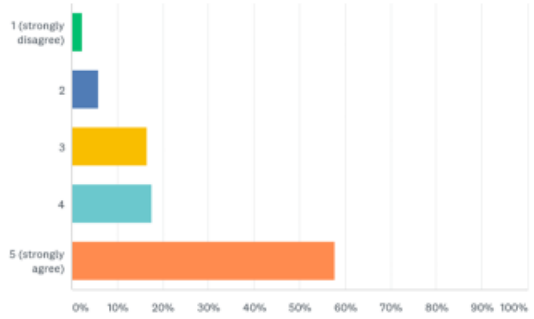
Q3...If work was done to remove Asian Clams, there would be an opportunity for FWP to do additional work to help improve aquatic fish habitat within Lake Elmo (e.g., increase the depth of the lake, improve aquatic vegetation, install gravel/rock jetty areas, create a sediment retention area, etc.). On a scale from 1 (strongly disagree) to 5 (strongly agree), to what extent do you agree or disagree FWP should do additional work to help improve aquatic fish habitat within Lake Elmo?

ANSWER CHOICES	RESPONSES	
1 (strongly disagree)	1.14%	1
2	3.41%	3
3	7.95%	7
4	14.77%	13
5 (strongly agree)	72.73%	64
TOTAL		88

Powered by SurveyMonkey

Figure 13. Public Survey Q3 Agree or Disagree Fisheries Table.

Q4...If work was done to remove Asian Clams, there also would be an opportunity for FWP to do additional work to make improvements to Lake Elmo State Park (e.g., installing fishing piers, creating rounded jetty areas with picnic tables, developing a natural amphitheater area adjacent to the lake, installing fishing boardwalks, etc.). On a scale from 1 (strongly disagree) to 5 (strongly agree), to what extent do you agree or disagree FWP should do additional work to help make improvements to Lake Elmo State Park?



Powered by SurveyMonkey

Figure 14. Public Scoping Q4 State Park Improvements Chart.

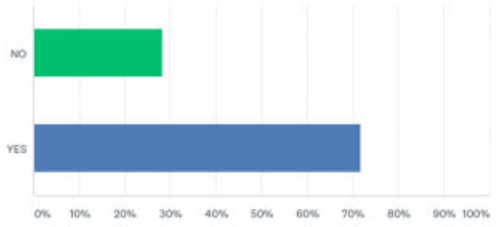
Q4: If work was done to remove Asian Clams, there also would be an opportunity for FWP to do additional work to make improvements to Lake Elmo State Park (e.g., installing fishing piers, creating rounded jetty areas with picnic tables, developing a natural amphitheater area adjacent to the lake, installing fishing boardwalks, etc.). On a scale from 1 (strongly disagree) to 5 (strongly agree), to what extent do you agree or disagree FWP should do additional work to help make improvements to Lake Elmo State Park?

ANSWER CHOICES	RESPONSES	
1 (strongly disagree)	2.35%	2
2	5.88%	5
3	16.47%	14
4	17.65%	15
5 (strongly agree)	57.65%	49
TOTAL		85

Powered by SurveyMonkey

Figure 15. Public Scoping Degree of Support Park Improvements Table.

Q5...Do you visit Lake Elmo State Park during the open water season (April thru October)?



Powered by SurveyMonkey

Figure 16. Public Survey Q5, Visitation Open Water Chart.

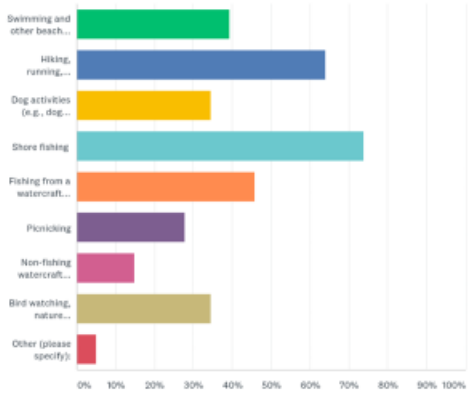
Q5: Do you visit Lake Elmo State Park during the open water season (April thru October)?

ANSWER CHOICES	RESPONSES	
NO	28.24%	24
YES	71.76%	61
TOTAL		85

Powered by SurveyMonkey

Figure 17. Public Survey Q5 Visitation Open Water Table.

Q6...What recreational activities do you typically participate in when visiting Lake Elmo State Park during the open water season (April thru October). (check all that apply)



Powered by SurveyMonkey

Figure 18. Public Survey Q6 Open Water Activity Chart.

Q6...What recreational activities do you typically participate in when visiting Lake Elmo State Park during the open water season (April thru October). (check all that apply)

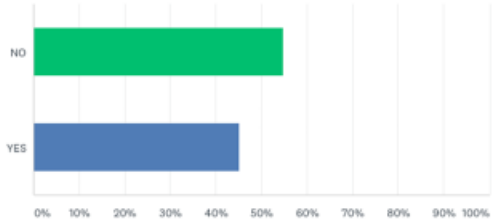
ANSWER CHOICES	RESPONSES	
Swimming and other beach activities	39.34%	24
Hiking, running, walking on park trails	63.93%	39
Dog activities (e.g., dog walking, dog swimming, dog park, etc.)	34.43%	21
Shore fishing	73.77%	45
Fishing from a watercraft (e.g., boat, canoe, kayak, etc.)	45.90%	28
Picnicking	27.87%	17
Non-fishing watercraft activities (e.g., boating, sailing, wind surfing, etc.)	14.75%	9
Bird watching, nature observation, wildlife viewing	34.43%	21
Other (please specify):	4.92%	3
Total Respondents: 61		

Note...Two respondents listed ice fishing as other response which is a winter activity.

Powered by SurveyMonkey

Figure 19. Public Survey Q6 Open Water season Activities Table.

Q7...Do you visit Lake Elmo State Park during the winter (November thru March)?



Powered by SurveyMonkey

Figure 20. Public Survey Q7 Winter Use Chart.

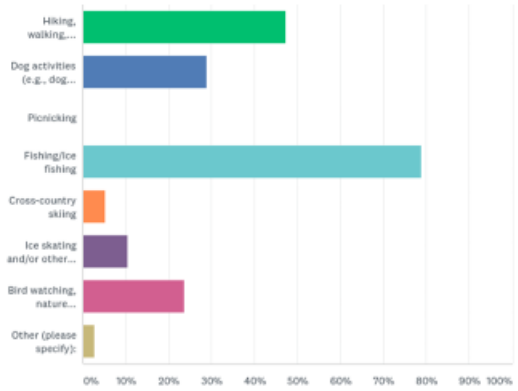
Q7...Do you visit Lake Elmo State Park during the winter (November thru March)?

ANSWER CHOICES	RESPONSES	
NO	54.76%	46
YES	45.24%	38
TOTAL		84

Powered by SurveyMonkey

Figure 21. Public Survey Winter Use Table.

Q8...What recreational activities do you typically participate in when visiting Lake Elmo State Park during the winter (November thru March). (check all that apply)



Powered by SurveyMonkey

Figure 22. Public Survey Q8 Winter Activity Chart.

Q8...What recreational activities do you typically participate in when visiting Lake Elmo State Park during the winter (November thru March). (check all that apply)

ANSWER CHOICES	RESPONSES	
Hiking, walking, running on park trails	47.37%	18
Dog activities (e.g., dog walking, dog park, etc.)	28.95%	11
Picnicking	0.00%	0
Fishing/Ice fishing	78.95%	30
Cross-country skiing	5.26%	2
Ice skating and/or other non-ice fishing activities	10.53%	4
Bird watching, nature observation, wildlife viewing	23.68%	9
Other (please specify):	2.63%	1
Total Respondents: 38		

Powered by SurveyMonkey

Figure 23. Public Survey Q8. Winter Use Activity Table.