Montana Fish, Wildlife & Parks

1400 South 19th Avenue
Bozeman, MT 59718

April 27, 2016

To: Governor's Office, Sheena Wilson, State Capitol, Room 204, P.O. Box 200801, Helena, MT 59620-0801
Environmental Quality Council, State Capitol, Room 106, P.O. Box 201704, Helena, MT 59620-1704
Dept. of Environmental Quality, Metcalf Building, P.O. Box 200901, Helena, MT 59620-0901
Dept. of Natural Resources & Conservation, P.O. Box 201601, Helena, MT 59620-1601
Montana Fish, Wildlife & Parks:

Director's Office	Parks Division	Lands Section	FWP Commissioners
Fisheries Division	Legal Unit	Wildlife Division	Design & Construction

MT Historical Society, State Historic Preservation Office, P.O. Box 201202, Helena, MT 59620-1202
MT State Parks Association, P.O. Box 699, Billings, MT 59103
MT State Library, 1515 E. Sixth Ave., P.O. Box 201800, Helena, MT 59620
Bureau of Reclamation, 7700 Canyon Ferry Rd., Helena, MT 59602
James Jensen, Montana Environmental Information Center, P.O. Box 1184, Helena, MT 59624
Janet Ellis, Montana Audubon Council, P.O. Box 595, Helena, MT 59624
George Ochenski, P.O. Box 689, Helena, MT 59624
Jerry DiMarco, P.O. Box 1571, Bozeman, MT 59771
Montana Wildlife Federation, P.O. Box 1175, Helena, MT 59624
Wayne Hurst, P.O. Box 728, Libby, MT 59923
Jack Jones, 3014 Irene St., Butte, MT 59701
Mark Natale, 46 Broadwater Rd., Townsend, MT 59644

Ladies and Gentlemen:

The enclosed Environmental Assessment (EA) has been prepared for the herbicidal control of the aquatic invasive curly-leaf pondweed (*Potamogeton crispus)* within the Canyon Ferry Wildlife Management Area (CFWMA). The proposed control action could occur potentially as early as late May/early June 2016. The purpose of the proposed action is to control curly-leaf pondweed (CLP) within the west and east canals on the CFWMA at least in the immediate future. If CLP spreads and becomes a problem elsewhere on the CFWMA (duck ponds for example), then there might be a need to control CLP elsewhere on the CFWMA in the future. The west canal supplies the water to Pond 4, and the east canal supplies the water to Ponds 2 and 3.

The objective for the proposed action is to reduce the amount of CLP in the two canals. CLP impedes water flow down the canals, which restricts the ability of MFWP to manage duck pond

water levels to desired levels during those times of the year that CLP is actively growing in the canals. CLP may also limit the growth of desired native aquatic plants in the canals. It is unlikely that control efforts would totally eradicate CLP from Canyon Ferry WMA as upstream populations would continue to provide plant propagules, but reductions in overall abundance will benefit water flow in the canals and native aquatic plant populations.

Montana Fish, Wildlife & Parks invites you to comment on the attached proposal. Public comments will be accepted until 5:00 p.m. May 27, 2016. Comments should be sent to the following address:

Attention: Adam Grove
Montana Fish, Wildlife and Parks
P.O. Box 998
Townsend, MT 59644

Or e-mail to adgrove@mt.gov

Sincerely,

Sam B. Sheppard
Region Three Supervisor

Attachment

Montana Fish, Wildlife & Parks

Draft Environmental Assessment

Control of the Aquatic Invasive Curly-leaf Pondweed

(*Potamogeton crispus)* within the

Canyon Ferry Wildlife Management Area, Broadwater County,

Montana

April 2016

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1 INTRODUCTION

1.1 Background

Curly-leaf pondweed (CLP) is a perennial non-native aquatic invasive plant that was introduced to the United States in the mid 1800's and is native to Eurasia, Africa, and Australia (Stuckey 1979). It forms dense mats of vegetation which can inhibit or limit water flow down channels and limit the growth of native aquatic plants.

1.2 Project Location

Canyon Ferry Wildlife Management Area (WMA) is located in Broadwater County just north of the town of Townsend. The majority of the WMA is owned by the Bureau of Reclamation (BOR) but is managed by Montana Department of Fish, Wildlife, and Parks (MDFWP) through a Cooperative Agreement with the BOR.

Figure 1. Canyon Ferry WMA location.

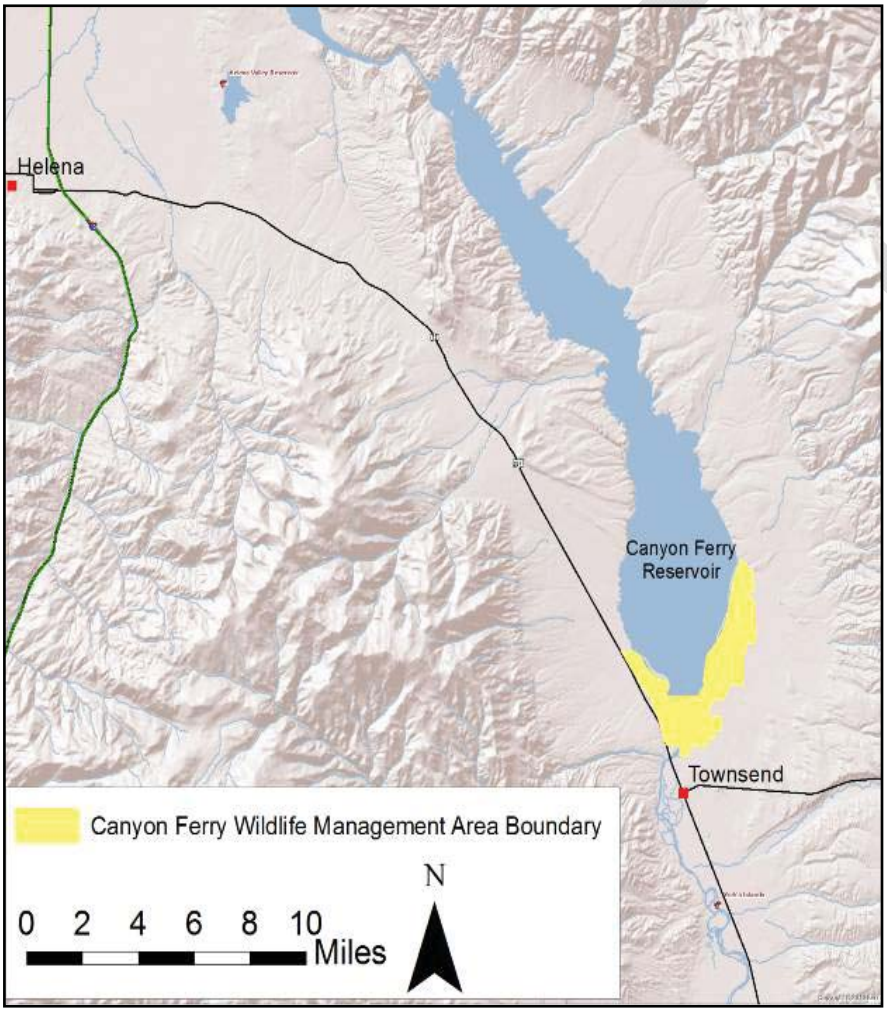

Figure 2. Aerial photo of lower end of Canyon Ferry WMA showing east and west canals.

Canyon Ferry WMA is 5,100 acres and is adjacent to the south end of Canyon Ferry Reservoir. The management area contains a river delta of the Missouri River at the inlet to the reservoir. The area is a typical river delta with many braided channels and backwaters of the Missouri River that provide many suitable areas for the establishment of EWM.

1.3 Previous Aquatic Invasive Control Efforts

Previous aquatic invasive control efforts on the CFWMA have involved Eurasian watermilfoil (*Myriophyllum spicatum*). Since the confirmation of EWM in Canyon Ferry WMA in 2010, management area staff and volunteers have worked to suppress known infestations. Previous efforts have included annual hand-pulls in the Cottonwood Channel including removal of 640 pounds of EWM in 2011 (105 worker hours) and 42 pounds of EWM in 2012 (28 worker hours).

In 2013, MDFWP worked with Montana Conservation Corps (MCC) members to hand-pull EWM within the West Canal. The canal is 1.7 miles long with steady width and grade. The crew consisting of MCC, MDFWP, Bureau of Reclamation staff, and other volunteers spent 5 days and removed 7,175 pounds of EWM (over 400 worker hours) while only covering .93 miles. Manual removal is not a viable option to suppress EWM in this canal.

An aquatic herbicide application for EWM was done in the west canal in September 2014 using a mixture of Cascade (Endothal) and Renovate 3 (Triclopyr) herbicides. Sampling done 9 months post-treatment indicated effective control results on EWM. No efforts to control curly-leaf pondweed have been done to date.

2 PURPOSE AND NEED

2.1 Proposed Action

The purpose of the proposed action is to control CLP within the west and east canals on the CFWMA at least in the immediate future. If CLP spreads and becomes a problem elsewhere on the CFWMA (duck ponds for example), then there might be a need to control CLP elsewhere on the CFWMA in the future. The west canal supplies the water to Pond 4, and the east canal supplies the water to Ponds 2 and 3. This environmental assessment evaluates three alternatives which include a No Action Alternative, non-herbicidal control options, and the preferred alternative that utilizes aquatic herbicidal chemical control. Under the preferred alternative, it's expected to take several years of herbicidal application to effectively reduce the amount of CLP in the two canals. After that, herbicidal application would occur on an as needed basis in the canals.

2.2 Object of the Proposed Action

The objective for the proposed action is to reduce the amount of CLP in the two canals. CLP impedes water flow down the canals which restricts the ability of MFWP to manage duck pond water levels to desired levels during those times of the year that CLP is actively growing in the canals. CLP may also limit the growth of desired native aquatic plants in the canals. It is unlikely that control efforts would totally eradicate CLP from Canyon Ferry WMA as upstream populations would continue to provide plant propagules, but reductions in overall abundance will benefit water flow in the canals and native aquatic plant populations.

2.3 Authorities and Relevant Documents

2.3.1 Authorities

MDFWP manages Canyon Ferry WMA under a Cooperative Agreement (No. R12AC60042) with the Bureau of Reclamation.

A Montana Discharge Elimination Permit (MPDES) is required to apply any pesticide in or over waters of the state. This permit is a pesticide discharge permit that allows the recipient to exceed temporarily tolerances established by the Montana Department of Environmental Quality. MDFWP will obtain this permit prior to any herbicide application.

2.4 Environmental Assessment Scope

Based on the EA that was written for the control of Eurasian watermilfoil on the CFWMA in 2014 (MDFWP, 2014), the following issues were identified to evaluate within the scope of this EA:

- Fish (including species of concern)

- Wildlife (including species of concern)
    - Migratory Birds
    - Mammals
    - Reptiles and amphibians
    - Mussels & Macroinvertebrates
- Vegetation
- Environmental
    - Water quality
    - Air quality
    - Sediments
    - Wetlands
- Recreation
- Human Health

3 ALTERNATIVES

3.1 Alternative 1: No Action Alternative

Under the No Action Alternative, there would be no control of CLP within the two canals on the CFWMA. CLP would persist within the canals and continue to limit water flows during that time of the year when it was actively growing. The No Action Alternative is not a desirable alternative because of the negative impacts that CLP currently has on water flows in the canals which are the primary source of water supply for duck ponds 2, 3 and 4 on the CFWMA.

3.2 Alternative 2: Non-herbicidal control methods

Under this alternative, MDFWP would attempt to utilize other methods to control CLP levels in the canals. These methods are not believed to be as effective as herbicidal control and are in some cases generally not feasible.

3.2.1 Manual/Mechanical Control

Manual/mechanical control methods could include hand pulling, suction dredges or using equipment such as rakes, cutting blades, trimmers or motorized-harvesting machines that cut the plants and remove them from the water. Besides potentially being labor intensive and/or very costly given the length of the affected canals, the fact that CLP will re-establish from any remaining roots and from turions (overwintering buds) on the plant fragments reduces the potential effectiveness of these control methods. In order for these methods to be effective, all plant roots and cut stem structures (turions) need to be removed when utilizing mechanical control methods. Depending upon the method used, plants or plant parts can be easily missed because of turbidity issues

3.2.2 Bottom Barriers

Bottom barriers can culturally control localized aquatic plant populations through compression and light reduction. Bottom barriers specifically for aquatic weed control are typically manufactured from materials that are heavier than water such as PVC, fiberglass or nylon. Bottom barriers are anchored in place with a variety of options such as pins, sandbags, bricks, PVC pipes weighted with sand or steel rebar, or rock. Larger panels that are installed in water depths greater than 4 feet usually require SCUBA gear for proper installation. Solid fabric barriers often need slits or vents to allow gasses to escape and to prevent billowing and must be kept clean of any buildup of sediment and debris. Bottom barriers are

usually used to control dense, pioneer infestations of an invasive species or as a maintenance strategy around boat docks and swimming areas.

Bottom barriers are also one of the most expensive methods for aquatic vegetation control if used in a large-scale application. They are cost effective when used in small areas. Because the material and installation costs can be expensive, bottom barriers are generally applied to small areas such as around docks and in swimming areas (WSDE 2010).

Bottom barriers should be left in place for a minimum of 1 to 2 months to ensure that target plants are controlled, but barriers must be regularly removed and cleaned of silt; otherwise, plants may begin to root on top of or through the barriers. Removal, cleaning, and re-deployment is usually required every 1 to 3 years depending on the rate of silt accumulation. Bottom barriers non-selectively control aquatic vegetation and may affect fish and other benthic organisms, which is another reason they are usually used for small, localized areas. In addition, high water flows can easily pick up bottom barriers and move them to new locations, potentially causing flooding risks if caught in culverts which is a possible danger in both canals.

The canals are several miles in length total, so because of the potential high cost involved, bottom barriers are not believed to be a feasible solution. In addition, a test trial of bottom barriers were used to control EWM in the west canal in 2013. It proved unsuccessful as high sediment loads quickly covered the bottom barriers and allowed new plants to colonize on top of the barrier by the spring of 2014.

3.2.3 Water Drawdowns

Water drawdowns can culturally control a number of invasive submersed species including CLP. This technique is used mostly in the northern U.S. to expose targeted plants to freezing and drying conditions. A principal attraction of a drawdown is that it is typically an inexpensive weed control strategy for lakes and canals with a suitable control structure. Plants that are usually controlled by drawdowns include many submersed species that reproduce primarily through vegetative means such as root structures and vegetative fragmentation.

Drawdown conditions maintained for 6 to 8 weeks will help ensure sufficient exposure to freezing and drying conditions. Excessive snow cover or precipitation can limit the effectiveness of this technique. When properly utilized, drawdowns can be a low-cost or no cost strategy to incorporate into an integrated management program.

A portion of the west canal was drawn down in conjunction with the Pond 4 drawdown; however, FWP was unable to draw down the upper end of the canal because of a combination of a leaky control structure and groundwater seep into the canal because of a high water table. Overland flooding into the west canal due to winter ice jams on the Missouri River is also a frequent issue. Given the dynamics of the east canal, FWP might potentially be able to draw down a limited portion of the canal; however, drawing down the entire length of the canal is not possible. Once again, while limited portions of the canals may be drawn down, total drawdowns are not possible. So, this option has been eliminated from further evaluation unless severe drought and decreases in groundwater depths occur.

3.3 Alternative 3 - Preferred Alternative: Utilize Aquatic Herbicidal Control

Under this alternative, MDFWP would conduct aquatic herbicidal applications in the two canals on the Canyon Ferry WMA as needed in an effort to control CLP. In situations where CLP alone was to be controlled, the aquatic herbicide Endothall would be applied by a licensed aquatic applicator during the late spring/early summer when CLP is actively growing. In situations where it might be feasible to control CLP and EWM simultaneously, Endothall and Triclopyr would be used in combination in order to better control both species – see MFWP environmental assessment (2014) regarding the use of Triclopyr on the CFWMA to control EWM.

3.3.1 Herbicides

Aquatic herbicides are applied as concentrated liquids, granules, or pellets. Liquid herbicide formulations are applied to the entire water column to control the submersed weeds, and granular and pellet products are applied using granular spreaders and target the water column with vegetative growth. Aquatic herbicide applicators calculate the volume of the water to be treated before applying aquatic herbicides to ensure that the appropriate amount of herbicide is used.

Similar to herbicides used in terrestrial system, there are contact and systemic herbicides. Contact herbicides are the group of herbicides that result in the rapid injury or death of contacted plant tissues and lack mobility within plant tissues once taken into the plant tissue. Contact herbicides can be used to control temporarily aquatic plants such as CLP. These treatments are often initially effective, but treating large plants with a contact herbicide commonly leads to rapid recovery and re-growth from plant tissues that are not exposed to the herbicide. As a result, multiple applications of contact herbicides over several years are often needed to reduce populations as reserves get used up and new growth from turions are killed before development of new turions. For some aquatic invasive species such as EWM, systemic products have been utilized to control emergent plants (SCE 2010). Systemic herbicides are mobile in plant tissue and move through the plant's water-conducting vessels (xylem) or food-transporting vessels (phloem). Once the herbicide is absorbed into the plant, it can move through one or both of these vessels and throughout the plant tissue to affect all portions of the plant including underground roots and rhizomes. Unfortunately, systemic herbicides aren't really effective on CLP because of the nature of the plant.

Some types of herbicides that are used to control CLP effectively and examined for use in the Canyon Ferry WMA are listed below. Other chemicals may be used as they become available or as new science shows their safety and effectiveness in control of CLP.

3.3.1.1 Herbicides Selected For CLP Control

3.3.1.1.1 Endothall

Endothall is used primarily to control submersed plants, and use rates and methods of application vary substantially. Two forms of endothall are available: dipotassium salt and monoamine salts. The monoamine salts are more toxic to aquatic life, so endothall in the form of dipotassium salts will be considered for further evaluation. Levels above 0.3 grams of active ingredient for monoamine salts is toxic to fishes while it takes >100 grams of active ingredient for the dipotassium salts (WSDE 2010). This low toxicity for dipotassium salts makes this contact herbicide widely used in the US. For quiescent or slow moving water, there may be approximately 7 days restriction for water uses including animal consumption, but in flowing water treatments such as in the two canals, there are no restrictions for

swimming, fishing, livestock watering, and turf irrigation. The effectiveness of Endothall is not affected by factors such as alkalinity or turbidity of the water.

3.3.1.2 Herbicides Eliminated From Further Evaluation

3.3.1.2.1 Fluridone

Fluridone is a bleaching herbicide that targets a plant-specific enzyme that protects chlorophyll, the green pigment responsible for photosynthesis in plants. Fluridone is the only herbicide registered by the EPA that is labeled only for use in aquatic systems, and it is used primarily to control submersed plants. Fluridone symptoms are unique and highly visible, with the new growth of sensitive plants bleaching or turning white as chlorophyll in the plant is destroyed by sunlight. Susceptible plants will show bleaching symptoms in new shoot growth; however, it is important to note that bleaching symptoms do not always equal control, and actual plant death may not occur for months after an initial treatment (SCE 2010).

Fluridone has been described as both a selective and broad-spectrum herbicide because use rates can vary from 4 to 150 ug a.i./L. Higher rates often provide broad-spectrum control, whereas lower rates effectively control only a few species. The Fluridone label states that target weeds must be exposed to Fluridone for a minimum of 45 days. Required exposure periods will often depend on the plant species, stage of plant growth, and treatment timing. During the exposure period, new shoot growth of susceptible plants bleach which depletes the plant's reserves of carbohydrates needed for growth. This slow death (which may take two or more months) can be beneficial to the environment because plants continue to provide structure for habitat and produce oxygen through photosynthesis. The inhibition of weed growth can also allow native plants to re-grow if they are naturally tolerant of Fluridone, but re-growth is highly dependent on herbicide rate. The extended exposure requirement typically calls for treatment of the entire aquatic system or treatment of a protected lake or reservoir embayment. Despite the extended herbicide exposure requirements associated with Fluridone treatments, there are no restrictions for potable water use, fishing, or swimming; however, irrigation restrictions are described on the product label (7 – 30 days after treatment). The ability to apply low use rates in the parts per billion range, extended exposure requirements, and slow plant death have allowed Fluridone to be used for numerous whole-lake management treatments throughout the United States targeting invasive plants such as CLP and EWM. Again, for treatments to be effective, plants have to be exposed to sufficient concentrations of Fluridone for an appropriate period. As a result, sequential Fluridone treatments, often called "bumps," are usually applied over a period to ensure that an effective concentration of the herbicide is maintained. Fluridone is very flexible and can be used in systems of less than one acre and in systems that exceed several thousand acres. Regardless of the size of the treatment, target plants must be exposed to sufficient concentrations of Fluridone for an appropriate period in order to control the target plant effectively. For the concern of the long control period required (45-90 days) and potentially small window time for treatment, it is not being considered in the preferred alternative but could be considered in the future (SCE 2010).

3.3.1.2.2 Diquat

Diquat dibromide is the common chemical component of this herbicide. Diquat is a quick acting contact herbicide that works by disrupting cell membranes and interfering with photosynthesis (BLM 2005). It is a non-selective herbicide, and it will kill a wide variety of plants on contact. It does not move throughout the plants, so it will only kill the parts of the plant that it contacts. Following treatment, plants will die within a week. Diquat will not be effective in water bodies with muddy water or where plants are

covered with silt because it is strongly attracted to silt and clay particles in the water. Therefore, bottom sediments must not be disturbed during treatment. There are no restrictions on swimming or eating fish from water bodies if treated with diquat. Treated water cannot be used for drinking water for one to three days, depending on the concentration used in the treatment, or be used for pet or livestock drinking water for one day following treatment (WDNR 2012). Results from a risk assessment indicate there is potential risk to aquatic species including fish and macroinvertebrates, especially endangered species, in a pond or stream sprayed with diquat (BLM 2005). Diquat was eliminated from further consideration due to potential turbidity issues in the management area, toxicity issues to fish and watering restrictions where wildlife may be ingesting the treated water.

4 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

4.1 Fisheries

4.1.1 Affected Environment

Canyon Ferry Reservoir and the Missouri River prior to entering the reservoir are home to many different species of fishes. Native species include burbot, longnose dace, longnose sucker, mottled sculpin, mountain whitefish, stonecat, westslope cutthroat trout, and white sucker. Intentionally introduced species include brook trout, brown trout, rainbow trout, common carp, fathead minnow, flathead chub, largemouth bass, smallmouth bass, and yellow perch. Illegally introduced species include northern pike, Utah chub, and walleye (FWP MFISH, 2014). The two canals typically contain very few fish, but stonecats, carp, suckers, and minnow species are found scattered within the canal. According to Guard (1995), CLP tends to increase oxygen levels and to produce substantial organic material in aquatic environments, and provides shelter to small fish and aquatic insects that provide food for larger fish and amphibians.

Threatened, Endangered, and Sensitive Fish Species

The westslope cutthroat trout is one of two cutthroat trout subspecies in Montana. Most genetically pure populations are located in headwater streams. Westslope cutthroat trout are extremely rare in Canyon Ferry Reservoir with data only existing from a single sample collected in the reservoir (MT FWP MFISH data). As such, the likelihood of a westslope cutthroat trout being impacted by the proposed activity is extremely unlikely.

4.1.2 Environmental Consequences of Alternative 1: No Action Alternative

Direct and Indirect Effects

With the No Action Alternative, no control work will occur on CLP within the two canals. As such, there will likely be no change in the quality of fish habitat for better or worse in the two canals.

Cumulative Effects

The cumulative effects from the No Action Alternative would likely include expansion of CLP within the Canyon Ferry WMA to include the duck ponds, if it is not found there already.

Threatened, Endangered, and Sensitive Fish Species

Given that no threatened, endangered, or sensitive fish species have been found in either of the two canals or in any of the duck ponds, the No Action Alternative will not affect these species.

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4.1.3 Environmental Consequences of Alternative 2

Direct and Indirect Effects

Manual/mechanical control methods if effective would reduce the amount of CLP in the canals. Hand removal and diver-operated suction dredges may temporarily affect fisheries due to turbidity issues as well as disturbance of the habitat. Bottom barriers could interfere with fish spawning if placed over locations where species typically choose to spawn. In addition, the benthic community would likely be impacted in the localized areas of the barriers. Desired vegetation would also be killed alongside invasive species, so dense patches of native plants could be killed leaving bare ground for establishment of desired non-natives further altering fish habitat. However, bottom barriers are typically used in small-scale control efforts due to high costs associated with their use, so any disturbance would likely be localized.

Cumulative Effects

Removal of CLP would negatively affect habitat for small fish and aquatic insects that provide food for larger fish and amphibians. CLP also tends to increase oxygen levels and to produce substantial organic material in aquatic environments, so these benefits would be eliminated. Removal of CLP would provide sites where native vegetation could increase creating a more typical environment for native fishes. It should be noted regarding all potential fisheries related impacts that the irrigation canals are not intended to provide suitable habitat for aquatic species nor are the duck ponds which the canals supply water to. Mortality of fish and invertebrates in the canals is largely due to seasonal flow manipulation of the canals.

Threatened, Endangered, and Sensitive Fish Species

Given that no threatened, endangered, or sensitive fish species are believed to be found in either of the two canals or in any of the duck ponds, Alternative 2 would not affect these species.

4.1.4 Environmental Consequences of Alternative 3

The proposed herbicide (Endothall) in this project is a herbicide that is labeled to be used or will be effective in this environment, has been registered by both the EPA and Montana Department of Agriculture, and has been deemed safe if applicators follow the manufacturer's label during application. The applications will occur once per year, and exposure times will be short (less than 24 hours).

Direct and Indirect Effects

<u>Endothall</u>

No negative effects have been shown to survival, growth, or reproduction of some warm water fishes including bluegill and largemouth bass over a two-year period when exposed to dipotassium salt of endothall. Rainbow trout is one of the most sensitive fish species in the project area. Empirical tests show that the there is no impact to this species with endothall levels below 5mg a.i./L (maximum-labeled rate). Even when Endothall is used at a high rate of 3.5 mg a.i./L, no impact to fish are expected (WSDE 2001).

The applicators will strictly adhere to all herbicides labels and manufacturer's recommendations. In addition, exposure times will be short, and repeat applications in the same year are not expected. Therefore, fish within the project area would not be impacted directly by the proposed herbicide applications. The maximum label rates is 5 mg/L endothall, but lower rates are expected to be used since lower levels should kill CLP plants and meet project objectives while reducing potential risks to

non-target plant species and fish species and wildlife. As the treatment will occur in flowing water systems, herbicide dissipation will be rapid, lasting a few hours to days. Dilution will occur once the chemical enters any of the duck ponds. In addition, flows could be increased temporarily to expedite dissipation after the treatment is complete. This dilution and dissipation will help return herbicide concentrations back down to levels within water quality standards. All these factors will reduce the risk to fisheries and will not pose any considerable risk.

When plants begin to decompose after herbicide treatments, there is often a drop in dissolved oxygen levels. These reductions can be fatal to fish species in situations with little water exchange. The moving water through the canals will increase dissolved oxygen. Changes in other nutrients may occur during plant decomposition, but these temporary impacts will be quickly diluted and levels will stabilize with inputs of fresh water upstream and the additional large volume of water in the duck ponds where the canals end.

Cumulative Effects
Endothall is unlikely to pose a risk of bioaccumulation in fish, and as applications typically occur annually the risk of bioaccumulation is further reduced (WSDE 2010). Post treatments surveys of CLP by MDFWP staff performed both 6 weeks after treatment and one year after treatment will determine the effectiveness of this treatment option and the potential for it to be used in the future.

Threatened, Endangered, and Sensitive Fish Species
The proposed action would not pose additional impacts to threatened, endangered, or sensitive fish species within the project area as no threatened, endangered, or sensitive fish species are believed to be found in either of the two canals or in any of the duck ponds.

4.2 Wildlife

4.2.1 Affected Environment

The primary goal of Canyon Ferry WMA is to provide productive habitat for the diversity of wildlife species that utilize the area and provide for consumptive and non-consumptive use of those resources (Carlsen and Northrup 1992).

Migratory Birds
Canyon Ferry WMA is used by migratory birds as well as resident birds that use the area year round. A total of 197 bird species have been observed on the Canyon Ferry WMA (Martinka 2005). The water resources on this management area are vital for the reproductive and migratory success of many of the species of birds found on the management area. Four artificial ponds where constructed in the 1970's to enhance waterfowl production and reduce air quality problems due to wind-caused dust storms near the Canyon Ferry delta, and these ponds provide valuable nesting habitat. The management area also supports wild populations of ring-necked pheasant, Hungarian partridge, and turkeys.

Mammals
A wide variety of mammals are found on the management area including large mammals such as moose, white-tailed deer, mule deer, antelope (very limited use), coyotes, occasional black bears, and mountain lions. Smaller mammals include bobcat, fox, raccoons, beaver, skunks, rabbits, and rodents.

Reptiles and amphibians
Common reptiles and amphibians found within Canyon Ferry WMA include the painted turtle, bullsnake, common garter snake, western toad, and leopard frog (Flath 1984). There are no known reptile or amphibian species of concern with the management area.

Mussels & Macroinvertebrates
Macroinvertebrates found within the project would be those species typically found in a ditch or small, slow moving water bodies. A spring snail is a species of concern within the management area, but it is found in a spring outside the project area.

Threatened, Endangered, or Sensitive Species of Concern
The Montana Natural Heritage Program tracks the distributions and sightings of federally and state listed species of concern. Information provided from them identified 11 animal species of concern. These species include Clark's grebe, American white pelican, great blue heron, bald eagle, long-billed curlew, Caspian tern, common tern, Clark's nutcracker, veery, bobolink, and a spring snail. All of these species are avian species with exception of the spring snail that is only found in springs outside of the project area. Most of these bird species also utilize aquatic environments for foraging, breeding, or migratory habitat. This list of species includes those found within a mile buffer from the project area to ensure no other species of concern in the area may utilize the project area.

4.2.2 Environmental Consequences of Alternative 1: No Action Alternative
The No Action Alternative will not actively manage CLP. Pond 4 was drawn down in the summer/fall of 2014 and is currently almost completely dry. CLP left untreated in the West Canal could disperse down the canal into Pond 4 once FWP allows water to flow down the entire length of the canal into Pond 4. The presence of CLP in Pond 4 could negatively affect desired native submergent vegetation species and therefore negatively affect the quality of waterfowl habitat in Pond 4. Given the presence of CLP in the East Canal, there is the potential for CLP to be introduced into Ponds 2 and 3 as well; although the presence of carp, particularly in Pond 3, and the resulting water turbidity created by carp may inhibit the presence of CLP currently. However, future draw downs to kill carp and to aerate pond soils will likely occur in Ponds 3 and 2 in the next 5 years, so a similar situation as to the one currently involving Pond 4 would occur. All the duck ponds are managed for waterfowl habitat, so the presence of CLP in the ponds could negatively affect the overall quality of waterfowl habitat in the ponds even though some species of waterfowl may potentially forage on CLP. The presence of CLP would likely have cascading effects on native plant communities which will likely affect many different animals that rely on those native plant communities. These unknown cascading effects could also extend into surrounding terrestrial ecosystems since aquatic ecosystems provide resources to other ecosystems.
Some amphibian species could benefit from the increase in CLP because CLP may provide shelter to small fish and aquatic insects that may provide food to some species of amphibians.

Threatened, Endangered, or Sensitive Species of Concern
No specific differences exist between species of concern and other species potentially using the project area.

4.2.3 Environmental Consequences of Alternative 2

Direct and Indirect Effects

Waterfowl and some migratory birds utilizing the canals would likely be impacted slightly by mechanical removal of CLP from the canals if those species utilize CLP either for forage or as result of disturbance activities associated with its removal. This will force these species to locate new forage areas within the project area. This relocation should not be difficult as there are many side channels in the project area capable of supporting native plant communities as well as the duck ponds.

Hand removal or use of diver-operated dredges for control of CLP would likely disturb benthic organisms to some extent. Some macroinvertebrates would also be removed from the system with the plant material. As manual methods are slow and labor-intensive, only small areas would be controlled in this manner, so the aquatic organisms will not be greatly impacted. It is expected that any reduction would be short-lived with macroinvertebrates quickly colonizing new plant growth in the area.

Bottom barriers would likely cause benthic community reductions directly under barrier placement locations. Studies have shown 69 - 90% reductions in invertebrates in those areas where barriers were placed (Engel 1990; Ussery 1997). As these methods are cost prohibitive, only small sections of EWM infestations could be controlled at a time so surrounding benthic communities would likely quickly re-colonize and recover.

Other animals utilizing aquatic ecosystems might experience short-term negative impacts from hand removal or diver-operated suction dredges with increased turbidity, or loss of forage or breeding habitat. This turbidity would dissipate rapidly in areas that experience high levels of water-exchange.

Cumulative Effects

Due to the relationships that exist between different species within the food web, any large-scale impact or displacement may cause cascading effects into other trophic levels. It is unlikely that displacement of any of these animals would cause large-scale ecosystem collapses, but localized reductions in diversity or abundance is possible.

Threatened, Endangered, or Sensitive Animal Species

With Alternative 2, it is likely that there will be no major direct, indirect, or cumulative effects to any of the species of concerns within this project area. All impacts will be similar to the above effects with slight temporary effects.

4.2.4 Environmental Consequences of Alternative 3

Direct and Indirect Effects

Studies show low toxicity to endothall to *Daphnia magna*, a common test species, when maximum application rate is applied. No adverse impacts have been seen to Cladocerans, Copepoda, and Calanoida. In addition, no adverse direct effects or indirect effects, like reductions in dissolved oxygen, have been noted in free-swimming species. Benthic invertebrates display similar characteristics with low acute toxicity (WSDE 2010). Application of Endothall at the label rates will not adversely affect any macroinvertebrates.

Mallard ducks have an LC50 of 50mg a.i./L for Endothall, which is nearly ten times the maximum-labeled rate (WSDE 2001). Wildlife could be exposed to chemicals through treated water they use as drinking water or eating aquatic organisms exposed to the chemicals. Based on acute and chronic studies, the proposed chemical does not pose any significant risks (WSDE 2010). Exposure risk is minimal due to the short exposure time, fresh water exchange from upstream, and dissipation into Pond 4. In addition, there is a low tendency for bioaccumulation of Endothall (WDSE 2010).

Threatened, Endangered, or Sensitive Species
The proposed action may pose minimal short-term impacts to threatened, endangered, and sensitive wildlife species within the project area. The direct and indirect impacts are the same as those discussed above.

Cumulative Effects
It is expected that control of CLP would improve aquatic habitat and improve biodiversity. Water delivery by the canals to Ponds 2, 3, and 4 would also be improved. Cumulative effects of the proposal are unlikely to be significant.

4.3 Native Vegetation

4.3.1 Affected Environment

Within the project area where the treatment will occur, typical native aquatic plants are found as well as riparian plants along the waters' edge. Grasses, particularly reed canarygrass (*Phalaris arundinacea*) dominate the edges of the canals. There are no plant species of concern in the project area.

4.3.2 Environmental Consequences of Alternative 1: No Action Alternative

Under the No Action Alternative, it is likely that CLP would continue to spread in acreage and in density. This could potentially have cascading effects on native aquatic plant communities. CLP may utilize habitat typically occupied by native aquatic plant species which could result in system scale reductions in the native plant community. However, because of its annual growth cycle CLP usually declines during the summer months and therefore may not compete directly with many submergent species.

4.3.3 Environmental Consequences of Alternative 2

Direct and indirect effects
Under Alternative 2, mechanical control would work to reduce CLP levels. However, failure to remove all turions via any mechanical removal method would result in the species becoming re-established and or becoming established in other locations. Bottom barriers will non-selectively kill plants lying under the fabric. Water drawdowns will indiscriminately kill native and nonnative species. Hand pulling and diver operated suction dredging will more selectively remove CLP while leaving native species. However, turbidity caused during removal makes missing individual plants or plant parts very likely, and these two techniques are only effective in small areas. As a result, it is likely not all the CLP and CLP parts would be removed.

Cumulative effects
As individual plants or turions would likely be missed, CLP would persist and spread into new areas or reestablish in treated areas. This could cause additional impacts to the native plant communities within CFWMA's Ponds 2, 3, and 4.

4.3.4 Environmental Consequences of Alternative 3
Direct and indirect effects
Endothall is a non-selective contact herbicide, so some native plant species may be impacted when exposed to higher levels of Endothall. However, within the area that is being treated with herbicide, very few native plants exist because the CLP covers most of the suitable substrate for plant growth in many areas. While the canals provide some measure of waterfowl and shore bird habitat, their primary importance is in providing water delivery to the duck ponds. The dilution that occurs when the water from the canals enters the ponds will reduce chemical levels in the pond to levels that will not affect plant communities. Depending upon application timing, Endothall would also kill any existing EWM plants that are in the canals as well. Some EWM is still present in the West Canal which was treated for EWM in 2014. No EWM has been found in the East Canal to date, but that situation could easily change given that the water in the East Canal comes from the Missouri River which has EWM in its watershed.

Cumulative effects

Alternative 3 will lead to large-scale reductions in CLP after several years of treatment. This will allow native plants to colonize exposed substrates. Though CLP will likely reestablish from upstream sources in some areas, native plants will also, so the overall impact from CLP will be reduced. Depending on application timing, Endothall treatments would also act to kill any EWM in the canals as well.

4.4 Water Quality
4.4.1 Affected Environment
The proposed action includes the two canals which supply water to Ponds 2, 3, 4 on the CFWMA. The canals do not serve as a water source for irrigation. Neither the canals nor the ponds are used for human or livestock drinking water. Various wildlife species including white-tailed deer and moose may use it as a water source.

4.4.2 Environmental Consequences of Alternative 1: No Action Alternative
Direct or Indirect Effects
Under the No Action Alternative, CLP infestations would persist and likely spread. No chemicals would be used so the associated risks with those would be eliminated. Actively growing CLP tends to increase oxygen levels and to produce substantial organic material in aquatic environments. However, water quality could degrade through dissolved oxygen depletion due to annual senescence of large CLP beds. Decaying CLP can also cause heavy summer algae blooms, which would reduce water quality.

Cumulative Effects
Under the No Action Alternative, CLP infestations would persist and likely increase and spread. This spread could lead to additional localized dissolved oxygen depletion when the plants die back on an annual basis.

4.4.3 Environmental Consequences of Alternative 2

Direct and Indirect Effects

The most likely impacts of Alternative 2 would include temporary increases in water turbidity and potential reductions in dissolved oxygen levels. Hand pulling, raking, etc. and diver-operated dredges will temporarily increase turbidity at the location of the activity. Increases in nutrients or reductions in dissolved oxygen would not be likely since the plant material is removed from the water. Bottom barriers will not cause major increases in turbidity but may cause localized reductions in dissolved oxygen levels due to decomposition of plants trapped beneath the barrier. Dissolved oxygen levels will be near zero beneath the barrier, so impacts to the benthic community are likely (Ussery 1997). In addition, increases in phosphorus may occur with plant decomposition. This could temporarily increase phytoplankton growth. The potential for adverse impacts is limited to localized areas since these methods would only occur in at a small, localized scale.

Cumulative Effects

Large infestations of CLP, such as in the East Canal, would not be effectively suppressed, increasing the potential for eventual large-scale die-offs of CLP which in turn could lead to dramatic drops in dissolved oxygen when the die-offs occur. This could potentially affect aquatic ecosystems within the three duck ponds that the canals supply water to.

4.4.4 Environmental Consequences of Alternative 3

Direct and Indirect Effects

The direct and indirect effects resulting from Alternative 3 only include short-term impacts. All chemical applications will follow label restrictions and application rates specified by the manufacturer. As recommended rates will exceed water quality standards, a Montana Discharge Elimination Permit will be obtained prior to application.

Endothall is stable in pure water, at a pH of 7 has a half-life potential of 2,285 days, and does not go through hydrolysis or photolysis. However, microorganisms play the major role in Endothall breakdown. The half-life of Endothall in a typical field application, in which microorganisms would be present, is one day to about eight days. Endothall total persistence time is typically 30 to 60 days. High water temperatures decrease total persistence time. As this chemical breaks down quickly, and has a short half-life, water quality standards would only be exceeded for a short time.

Cumulative Effects

Exposure of living plant tissue to herbicides usually results in secondary effects that may affect the biota. When plants start to die, there is often a drop in the dissolved oxygen content associated with the decay of the dead and dying plant material. Reduction in dissolved oxygen concentration may result in aquatic animal mortality or a shift in the dominant form or diversity of biota (WDSE 2010). There may also be changes in the levels of plant nutrients due to release of phosphate from the decaying plant tissue and anoxic hypolimnion. In addition, ammonia production, from the decay of dead and dying plant tissue, may reach levels toxic to the resident biota. Ammonia may be further oxidized to nitrite, which is also toxic to fish. The presence of these nutrients may cause an algal bloom to occur (WDSE 2010). In order to mitigate for these potential negative cumulative impacts, application will occur as early in the season as possible to target plants when they are actively growing but biomass levels have not reached maximum levels (i.e. plants are not topped out in the water column). Input of fresh water and dilution

into the ponds will also reduce potential build up of toxic chemicals or depletion of dissolved oxygen helping to mitigate any potential negative cumulative effects.

4.5 Air Quality

4.5.1 Affected Environment

The State of Montana, as well as the Federal EPA, has established standards regarding several air quality contaminants including carbon monoxide, lead, hydrogen sulfide, sulfur dioxide, particulate matter smaller than 10 microns, particulate matter smaller than 2.5 microns, ozone, and nitrogen dioxide. The nearest air quality station is located in Lewis and Clark County, north of Canyon Ferry WMA. The station measures carbon monoxide, ozone, sulfur dioxide, and particulate matter, which measurements are all below the set standards.

4.5.2 Environmental Consequences of Alternative 1: No Action Alternative

Direct and Indirect Effects

Under the No Action Alternative, no control efforts would occur for CLP, and consequently there would be no direct or indirect effects to the air quality in the area.

Cumulative Effects

Under the No Action Alternative, no control efforts would occur for CLP, and consequently there would be no cumulative effects to the air quality in the area.

4.5.3 Environmental Consequences of Alternative 2

Direct and Indirect Effects

Suction dredging or any mechanical removal method involving machines would have a minimal effect on air quality from the use of combustion engines. As such, direct and indirect effects on air quality are not considered significant.

Cumulative Effects

Operation of a diver-operated suction dredge or other mechanical removal method involving machines would likely only occur during a few days each year, so the cumulative effects of the operation would not be considered significant.

4.5.4 Environmental Consequences of Alternative 3

Direct and Indirect Effects

Herbicide application used for CLP control is not expected to appreciably effect air quality because of the small size of the areas treated, the amount of herbicide used, the mode of application (injection or granular compared to boom or aerial applications), and the rapid dilution of herbicides in the air. As such, effects on air quality are not considered significant.

Cumulative Effects

Application would only occur once a year on a limited number of surface acres of water, so significant cumulative effects on air quality would be unlikely. No local area tolerances of air pollution are expected to be exceeded.

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4.6 Sediments

4.6.1 Affected Environment

The areas that will be controlled for CLP are aquatic; therefore, the sediments play a large role in aquatic ecosystem. There is a range of sediment types which are determined by water velocity in the area. Sediment types in aquatic environments include cobble, gravel, sand, or silt.

4.6.2 Environmental Consequences of Alternative 1: No Action Alternative

Direct and Indirect Effects

Under the No Action Alternative, no control of CLP would occur so no changes in the sediment would occur.

Cumulative Effects

Under the No Action Alternative, no control of CLP would occur, so changes in sediment levels is unlikely. However, increased sedimentation due to establishment of dense CLP and reductions in water velocity could change the benthic community with potential cascading effects to aquatic and terrestrial ecosystems.

4.6.3 Environmental Consequences of Alternative 2

Direct and Indirect Effects

Any mechanical form of removal would require disturbance of the sediments, though only in the areas where CLP occurs. This small-scale disturbance will not likely have any adverse effects on sediments.

Cumulative Effects

Removal of CLP will increase water flow and hence velocities in some sites; although, the canal gradients limit water velocity to a large degree, so little scouring of silts is likely to occur even with increased water flows.

4.6.4 Environmental Consequences of Alternative 3

The environmental fate of herbicides in sediments may play a role in its potential risk to fish, wildlife, and human health. The chemicals in the preferred alternative were selected because of their short half-lives and their inability to adsorb to soils. As a result, these chemicals should not pose a risk resulting in the maintenance of high quality sediment for the benthic community.

Endothall half-lives in aerobic soils with viable microbial populations ranged from less than one week to approximately 30 days (WSDE 2010). In two field tests, residues were non-detectable after 21 days. In lacking sufficient microbial populations able to degrade Endothall, two studies found a half-life of 166 days and persistence of residues over 0.05 mg a.i./L more than one year (WSDE 2010). It is likely that the West Canal and Pond 4 contain sufficient microbes to accelerate the degradation process. Due to high water solubility and low soil/water distribution coefficient, dipotassium endothall does not adsorb well to most soils (WSDE 2010).

4.7 Wetlands

4.7.1 Affected Environment

The project area is the two canals and Ponds 2, 3 and 4 that the canals supply water to. The majority of the West Canal exists outside of any wetland complexes until it nears Pond 4 where it passes through some palustrine wetlands dominated by riparian forests, shrubs, and emergent sites. The East Canal is

similar to the West Canal regarding wetlands. The three affected wildlife ponds typically have palustrine wetlands dominated by shrub and emergent type wetlands, though some lacustrine sites may exist in the deeper portions of the ponds.

4.7.2 Alternative 1: No Action Alternative

Under the No Action Alternative, no direct or indirect effects should occur to wetlands in the project area nor should there be a net change in wetland acreage. However, the quality of deeper water wetlands may decrease as biodiversity decreases with increases in CLP populations.

4.7.3 Environmental Consequences of Alternative 2

Direct and Indirect Effects

Bottom barriers will effectively remove vegetation with the potential 100% control of plants. As such, there is risk to wetlands with standing water during control efforts. Though bottom barriers are non-selective, their small-scale use allows some selectivity of species by allowing the manager to avoid critical habitat where CLP is not present. The sites where bottom barriers are installed will likely see 2-3 years of control, though colonization is largely influenced by the rate of propagules introduction.

Manual/mechanical control methods such as hand-pulling and diver-operated suction dredges will not adversely affect wetlands as CLP plants can be selectively removed while leaving native plant species. However, rapid increases in turbidity occur at the work site because of control efforts, so target species are easily missed. This difficulty in spotting target species reduces the overall efficacy of hand pulling and diver-operated suction dredges.

Cumulative Effects

There are no cumulative effects from utilizing manual/mechanical control methods.

4.7.4 Environmental Consequences of Alternative 3

Direct and Indirect Effects

Because of the manner in which herbicide products are applied, impacts to other wetland environments are unlikely. There may be some flow of water into estuarine, palustrine, riparian, lentic, or lotic environments. However, it is not anticipated that the impact would be measurable due to dilution effects since the treated water quickly dilutes as it flows from the canals into the ponds. The total application of Endothall should not exceed 5ppm within a 7 day interval with 30ppm as a maximum per annual growing season.

Cumulative Effects

Control of CLP will help reestablish desired submerged vegetation within wetlands and open water areas. As the chemicals will quickly dissipate, there should be no further cumulative effects from active ingredients affecting the native community.

4.8 Recreation

4.8.1. Affected Environment

Canyon Ferry WMA is a sought out location for recreationists to view wildlife, hike, camp, fish, and hunt upland birds, waterfowl, and big game species. As such, it is important to control invasive plants such as CLP. While in the process of controlling those species, it is important to prevent impacts to recreation as much as possible.

4.8.2 Environmental Consequences of Alternative 1: No Action Alternative

Direct and Indirect Effects

Under the No Action Alternative, there would be no efforts to suppress or control CLP. As such, recreation opportunities could be adversely impacted, with decreases in biodiversity and difficulty in navigating watercraft through dense CLP patches if CLP spreads to and increases in the three ponds.

Cumulative Effects

A heavy CLP infestation in any of the ponds could result in decreased recreational opportunity, primarily in waterfowl hunting. A reduction in opportunity may have impacts to the local economy through loss of tourism, or increased costs of having to travel further to find the same recreational opportunity. Spread of CLP to other non-infested water bodies could also occur through transport on watercraft or hunting/fishing equipment.

4.8.3 Environmental Consequences of Alternative 2

Direct and Indirect Effects

Given that control efforts would be directed at the two canals, unless CLP becomes an issue in the ponds, little to no impacts to recreationists would be expected as the canals aren't used by boaters. The canals are used some by waterfowl hunters in the fall, and the canal dikes are used by people walking throughout the year. Manual/mechanical control methods would likely not affect these users unless perhaps for short-term closures for some safety reason when active control was being done.

If CLP were to become an issue in one of the ponds, then bottom barrier use on high boat traffic areas would be expected to improve boating activities. Weighted materials used to keep barriers down will be made of natural material such as rocks or burlap sandbags, or from manmade material such as weighted PVC pipe to prevent injury to recreationists or equipment. Gases produced from decomposing plants can cause billowing of the bottom barrier. This billowing can lift the barrier off the bottom posing a navigational risk, so some slits in the fabric may be required to allow escapement of gases.

If CLP were to become an issue in any of the ponds, then any form of manual/mechanical removal of CLP would likely improve boating and recreation activities in areas of heavy vegetation.

Cumulative Effects

Manual/mechanical control efforts would help continue to provide the best recreation possible to the people of Montana. Control efforts would potentially improve recreation opportunities and provide valuable economic benefits to the state and local community.

4.8.4 Environmental Consequences of Alternative 3

Direct and Indirect Effects

The preferred alternative will help improve the overall recreation opportunities within Canyon Ferry WMA. Control of CLP will help prevent spread of the invasive species without closing the area to recreationists for any extended period of time, which will maintain or enhance recreational opportunity. Short-term closures in the canals would occur during chemical application to protect recreationists. These closures would be less than a day and will not prevent recreationists from using the rest of the management area.

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Cumulative Effects
Alternative 3 will help continue to provide the best recreation possible to the people of Montana. Efforts will maintain or enhance recreational opportunities and provide economic benefits to the state and local community.

4.9 Human Health

4.9.1 Affected Environment
Potential pathways for affecting human health include direct herbicide contact to herbicide applicators and direct herbicide contact, inhalation, or ingestion from members of the public that could potentially swim within or drink from treated areas shortly after application. The proposed herbicides quickly become diluted and quickly biodegrade; therefore, the opportunity for the public to be exposed to the herbicide is limited. The project area is a wildlife management area, so there are no sources of drinking water or wells within the project area.

4.9.2 Environmental Consequences of Alternative 1: No Action Alternative
Direct and Indirect Effects
With the No Action Alternative, no herbicide treatment or weed control activities would occur so there would be no direct or indirect effects to human health.

Cumulative Effects
The No Action Alternative would not result in changes to current human health conditions and therefore there would be no cumulative effects to human health.

4.9.3 Environmental Consequences of Alternative 2
Direct and Indirect Effects
With Alternative 2, manual/mechanic weed control activities would not incur any human health risks other than potential injuries associated with actual control activities.

Cumulative Effects
With Alternative 2, manual/mechanical weed control activities would not cause changes in any human health conditions, so there are no potential cumulative effects.

4.9.4 Environmental Consequences of Alternative 3
Direct and Indirect Effects
The chemical to be used in Alternative 3 is approved by the EPA and registered in the State of Montana. This herbicide is water-soluble and readily eliminated by humans, so it does not pose a risk of bioaccumulation. The short half-life of the selected herbicide also reduces potential intake by humans. Research has shown little or no acute risk to human health if used within the manufacturer's specification through all possible exposure vectors (WSDE 2001). Chronic exposure assessments indicate human health should not be adversely impacted from chronic exposure to this chemical via ingestion of fish, ingestion of surface water, incidental ingestion of sediments, dermal contact with sediments, or dermal contact with water (swimming) (SCE 2010). The proposed herbicide has been chosen for its sensitivity to human health and the environment.

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Endothall

Repeated daily or weekly chemical exposures for short time frames typically occur during the application of a chemical or through dietary intake of a treated food crop or water. Most human chemical exposures are either acute (one time exposure) or sub chronic (exposure to a chemical for a few days or weeks). The potential for sub chronic exposure to Endothall would also occur when the chemical is used for aquatic weed control. Such exposures for persons in contact with recently treated water would primarily involve dermal contact with the chemical through swimming, ingesting the water or sediment, or dermal contact with treated sediments and aquatic weeds (WDSE 2001).

The results of the exposure and risk assessment indicate that a person could swim daily in the treated water and never reach the lowest No Observable Effect Level (NOEL) Endothall dose of 2.6 mg/kg/day. As a result, aquatic application of Endothall-containing products in compliance with label directions is not expected to result in adverse health effects following contact with treated water. Further, factors mitigating against any adverse health effects from applied Endothall are the high water dilution rate, poor dermal and gut absorption, rapid excretion of absorbed Endothall and short half-life in water, all of which support the conclusion that overexposure to the chemical is unlikely (WDSE 2001). An exposure assessment to evaluate swimmers' exposure to Endothall-treated water was conducted according to EPA's standard operating procedures for swimmer exposure in treated water, which calculated that the daily total dose to a person swimming in water containing 5 mg a.i./L endothall was extremely low and did not present an acute toxicity risk (Lunchick 1994).

Cumulative Effects

There are not expected to be any cumulative human health effects associated with the aquatic herbicide used in the proposed action if the chemical is utilized properly according to label directions. The treatment area will only have one treatment per year, and the actual area is relatively small. Rapid dilution will reduce potential chronic exposure time.

5 ENVIRONMENTAL ASSESSMENT PREPARATION

5.1 Environmental Impact Statement Determination

After considering the potential impacts of Alternatives 2 and 3 and planned mitigation measures to reduce predicted impacts to the physical and human environment, MDFWP has determined that an Environmental Impact Statement is not warranted. The anticipated negative affects to fisheries, vegetation, and the public would be minimized through the season of implementation, public education, appropriate application of herbicide, and natural process of the waterways.

5.2 Document Preparer

Adam Grove, MDFWP Wildlife Biologist, Townsend MT

5.3 Contributing Agencies, Organizations or Groups

U.S. Bureau of Reclamation, Canyon Ferry Field Office, Helena MT

6 PUBLIC PARTICIPATION

6.1 Public involvement

The public will be notified in the following manners to comment on this current EA, the proposed action and alternatives:

- One public notice in each of these papers: Helena Independent Record, Bozeman Chronicle
- Public notice on the Fish, Wildlife & Parks web page: *http://fwp.mt.gov*.

Copies of this environmental assessment will also be distributed to interested parties to ensure their knowledge of the proposed project.

6.2 Duration of comment period:

The public comment period will extend for (30) thirty days beginning **April 27, 2016**. Written or electronic comments will be accepted until 5:00 p.m. **May 27, 2016** and can be mailed or emailed to the addresses below:

Attention: Adam Grove
Montana Fish, Wildlife & Parks
P.O. Box 998
Townsend, MT 59644

Email: adgrove@mt.gov

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7 REFERENCES

Bureau of Land Management. 2005. Diquat Ecological Risk Assessment, Final Report. BLM Contract No. NAD010156. November 2005.

Carlsen, T. and R. Northrup. 1992. Canyon Ferry Wildlife Management Area Final Draft Management Plan. Montana Fish, Wildlife and Parks.

Lunchick, C. 1994. Assessment of Swimmer Exposure to Endothall in Aquathol® and Hydrothol® Treated Bodies of Water. Report Prepared by: Jellinek, Schwartz & Connolly, Inc. Arlington, VA. Report to Elf Atochem North America, Inc.

Engel, S. 1990. Ecological impacts of harvesting macrophytes in Halverson Lake, Wisconsin. J. Aquat. Plant Manage. 28:41-45.

Flath, D. 1984 Statewide nongame wildlife survey and inventory. Unpubl. Job Prog Rept., Montana Dept. Fish, Wildlife and Parks, Helena. 14 pp.

Foster, D.R., K.D. Getsinger, and D.G. Petty. 1997. Aquatic Dissipation of triclopyr in a Whole Pond Treatment, DowElanco, ENV94012. MRID 44456103.

Gardner, S.C.; and Grue, C.E. 1996. Effects of Rodeo and Garlon® 3A on Nontarget Wetland Species in Central Washington. Environmental Toxicology and Chemistry 15(4): 441-451.

Getsinger, K.D., D.G. Petty, J.D. Madsen, J.G. Skogerboe, B.A. Houtman, W.T. Haller, and A.M. Fox. 2000. Aquatic Dissipation of Herbicide Triclopyr in Lake Minnetonka, Minnesota. Pest Manag. Sci. 56: 388-400.

Green, W.R., H.E. Westerdahl, J.C. Joyce, and W.T. Haller. 1989. Triclopyr (Garlon® 3A) Dissipation in Lake Seminole, Georgia. Miscellaneous Paper A-89-2, US Army Engineer Waterways Experiment Station Vicksburg, MS.

Houtman, B.A., D.R. Foster, K.D. Getsinger, and D.G. Petty. 1997. Aquatic Dissipation in Lake Minnetonka, DowElanco, ENV94011. MRID 44456102.

Martinka, R., 2005. Birds of Canyon Ferry Wildlife Management Area. MFWP Brochure.

Montana Department of Fish, Wildlife, and Parks. 2014. Environmental assessment: Control of Eurasian Watermilfoil (*Myriophyllum spicatum*) within Canyon Ferry Wildlife Management Area, Broadwater County, Montana. Prepared by Craig McLane, Helena, MT.

Montana Department of Fish, Wildlife, and Parks. 2014. Montana Fisheries Information System (MFISH). http://fwp.mt.gov/fishing/mFish/. Accessed March 2014.

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Montana Noxious Weed Summit Advisory Council. 2011. Montana's Statewide Strategic Plan For Invasive Aquatic Plant Management and Resource Protection. Prepared by Celestine Duncan. Helena, MT.

Petty, D.G.; K.D. Jesting, J.D. Madsen, J. G. Skogerboe, W.T. Haller, A.M. Foxm and B.A. Houtman. 1998. Aquatic Dissipation of Herbicide Triclopyr in Lake Minnetonka, Minnesota. U.S. Army Corp of Engineers. Technical Report A-98-1.

Sanders County Extension (SCE), 2010. Environmental Assessment – Eurasian Watermilfoil/Curlyleaf Pondweed Research and Implementation Project: Phase 2. Prepared by Tetra Tech Inc. Helena, MT.

Stuckey, R.L., 1979. Distributional history of *Pomatogeton crispus* (curly pondweed) in North America. Bartonia 76:22-42.

Ussery, T. A., H.L. Eakin, B.S. Payne, A.C. Miller, and J.W. Barko. 1997. Effects of Benthic Barriers on Aquatic Habitat Conditions and Macro invertebrate Communities. Journal of Aquatic Plant Management 35: 69-73.

Washington State Department of Ecology (WSDE). 2001. Herbicide Risk Assessment for the Aquatic Plant Management Final Supplemental Environmental Impact Statement – Appendix D Volume 2: Endothall. WSDE – Water quality Program. Pub 00-10-044.

Washington State Department of Ecology (WSDE). 2004. Environmental Impact Statement (EIS) for Permitted Use of Triclopyr – Final. WSDE-Water Quality Program. Pub 04-10-018

Washington State Department of Ecology (WSDE). 2010. Final Supplemental Environmental Impact Statement for Freshwater Aquatic Plants Management. WSDE Water Quality Program: 00-10-040.

Wisconsin Department of Natural Resources. 2012. 2,4-D Chemical Fact Sheet. DNR PUB-WT-964.

Wisconsin Department of Natural Resources. 2012. Diquat Chemical Fact Sheet. DNR PUB-WT-969.

Woodburn, K.B. 1988. The Aquatic Dissipation of Triclopyr in Lake Seminole Georgia. Dow Chemical. GH-C 2093. MRID 41714304.

Woodburn, K.B., W. R. Green, and H.E. Westerdahl. 1993. Aquatic Dissipation of Triclopyr in Lake Seminole, Georgia. J. Agricultural and Food Chemistry 41: 2172- 2177.

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