

National Park Service  
U.S. Department of the Interior

Glacier National Park  
Waterton-Glacier International Peace Park  
Montana



## LARGE-SCALE REMOVAL OF LAKE TROUT IN QUARTZ LAKE FINDING OF NO SIGNIFICANT IMPACT

In compliance with the National Environmental Policy Act, the National Park Service (NPS) prepared an environmental assessment to examine various alternatives and environmental impacts for a large-scale lake trout removal effort in Quartz Lake.

Since Glacier National Park was designated a National Park in 1910, native fish populations have been negatively impacted by non-native fish species. Many of the early impacts were the result of stocking non-native fish. Non-native fish such as Yellowstone cutthroat trout (*Oncorhynchus clarkii bouvieri*) and rainbow trout (*O. mykiss*) were introduced into lakes and streams with native fish species such as westslope cutthroat trout (*O. c. lewisi*). Native fish hybridized with non-native fish species, and in many cases, the native species were lost from portions of their range within the park as a result of both hybridization and competition with nonnative fish. In more recent years native fish in the park have been significantly impacted by the invasion of non-native lake trout (*Salvelinus namaycush*) that have expanded within the Flathead River and lake system. Lake trout were originally introduced into Flathead Lake in 1905 (Deleray et al. 1999) and have migrated upstream into the lakes of Glacier National Park. Reproducing populations of lake trout subsequently became established in the majority of the accessible large lakes on the west side of the park. Research and monitoring have shown that the invasion of non-native lake trout into the lakes and streams west of the Continental Divide are having a major adverse impact on populations of federally-threatened bull trout (*S. confluentus*) (Fredenberg 2002) are likely adversely impacting the native westslope cutthroat trout, a Species of Concern in Montana.

Until recently, Quartz Lake, located within the park in the North Fork of the Flathead River drainage, was the largest natural lake within the Columbia River basin with an intact native fish species assemblage, including bull trout, not compromised by non-native species. In 2004 the park, with the assistance of the U.S. Fish and Wildlife Service, began construction of a fish barrier on Quartz Creek between Middle and Lower Quartz lakes to prevent the migration of non-native fish species into the Quartz Lake drainage. However, before it was completed, lake trout were discovered in Quartz Lake and the barrier project was halted.

The project will evaluate the size and location of the population of lake trout in Quartz Lake, locate the spawning habitat and experiment with techniques to implement effective lake trout suppression actions and reduce competitive/predation interactions between lake trout and bull trout.

### PREFERRED ALTERNATIVE

U.S. Geological Survey (USGS) and NPS fisheries staff will capture, radio-tag, and intensively track lake trout as they move around Quartz Lake and begin to stage at spawning areas during

September and October. Spawning locations and spawning timing will be estimated using the results of the telemetry data. Individual fish locations will be documented using GPS technology. This information will be used to evaluate lake trout suppression options and to target spawning concentrations of adult lake trout for removal using nets.

Field crews will use nets and hook and line methods to remove as many lake trout as possible in the fall from late August through November through 2012. Nets will be deployed on suspected lake trout spawning locations in the fall. Some netting may also occur in the spring (May- early July) depending on the locations of nesting sensitive birds (common loon and bald eagle).

We will employ the general knowledge and experience gained through lake trout removal netting operations currently underway on Yellowstone, Swan, Upper Priest lakes, as well as on Lake Pend Oreille. Each of these projects is attempting to reduce the abundance of lake trout to maintain native fish populations, as we propose to attempt on Quartz Lake.

An adaptive management approach will be employed to tailor netting times to seasons of greatest efficiency for catching and removing lake trout, while minimizing by-catch of non-target native fish species. Personnel involved with the project will continually evaluate locations, timing, and duration of net sets to maximize effectiveness of the netting for capturing lake trout. Similarly, park staff will confer with other ongoing lake trout suppression projects in the greater area to ensure gill nets are set at depths that make them most efficient in capturing lake trout while minimizing capture of non-target fish species. Any tagged lake trout captured alive in the gill nets will be released alive to identify additional spawning locations and improve spawning timing estimates. Biological samples/information will be collected from any captured lake trout including genetics, maturity status, and age and growth structures.

Lake trout have been documented to spawn from mid-October into early-November in the McDonald Lake system (Dux 2005), and it is anticipated a similar pattern exists for the Quartz Lake system. Timing and location of spawning areas is critical to minimizing non-target by-catch during the netting operation. Ideally, 30 lake trout will be tagged with individually coded transmitters that will be surgically implanted (Winter 1996). The locations of each tagged fish will be identified through telemetry data and recorded with a global positioning system (GPS). Water depth will be recorded from an on-board depth finder. Tracking will continue through the potential spawning season until mid-November, or as weather permits. Nets will be set to confirm the presence of mature fish as well as used for removal, in areas where spawning aggregates are located. Any lake trout captured that are not used for radio-tagging and tracking will be lethally removed. Fish bladders will be cut to allow the carcasses to sink and deposit in deeper areas of the lake to avoid removing nutrients from an already low-productivity lake system, and also to avoid attracting wildlife.

Gill nets are commonly used for large-scale fishing operations because of their ability to capture large numbers of fish with great efficiency. Mesh size, line strength, net length, and net depth are all factors in determining netting effectiveness. Mesh sizes for gill nets will be based on information gained from other similar studies (e.g. lake trout removal effort on Swan Lake, Montana), and sized to maximize the capture of lake trout while minimizing the capture and mortality of non-target fish species. Other entrapment methods may also be utilized depending on the success of the gill nets and the amount of by-catch.

An approximately 18-foot long motorboat equipped with a 50 horsepower 4-stroke outboard motor with a small (approximately five to six-gallon) external fuel tank will be flown into the site by helicopter and used to conduct the netting operation. Two flights will be required. This size boat is the minimum size that can safely carry the gear and work crew and also serve as a work platform on the lake.

The boat will be stored on shore, in a location protected from the weather as much as possible. Research staff and other project staff will stay at the Quartz Lake patrol cabin located at the foot of Quartz Lake during the spring and late August through early-November for approximately five days per week while implementing the project. Peak netting activities will take place during early morning hours and at dusk/night to take advantage of fish behavior. Fuel and other supplies will be packed in by stock and stored on-site. Fuel and oil will be stored in spill and bear proof containers near the cabin.

Monitoring for nesting eagles and loons will be conducted in the spring prior to the beginning of any netting activity. If nesting eagles and loons are present in areas also identified for netting and hook and line operations, mitigation to reduce or remove impacts will be implemented. (See below).

During the project, signs will be placed at trailheads leading to Quartz Lake informing hikers of the project and associated activity. Backcountry campsites and fishing will remain available to park visitors in this area. Backcountry permits issued for this area will include information about the project.

In the EA, this alternative included improving an existing fish barrier on Quartz Creek and construction of a boat house if necessary for storage. Both of these actions have been removed from the preferred alternative. It has been determined that a boat house will not be necessary. At present there is not enough information to make an informed decision on whether to improve the fish barrier and how. If later it is determined that the fish barrier is necessary, additional analysis and public involvement will be conducted.

## **MITIGATION MEASURES**

The following mitigation measures were developed to minimize the degree and/or severity of adverse effects and will be employed as needed:

### *Fisheries*

- Minimize handling stress and injury to native fish unavoidably captured. Quickly remove and release any captured bull or westslope cutthroat trout that appear alive and healthy.
- Check nets frequently to minimize mortality to non-target fish species.
- Use information gained from other lake trout removal projects to minimize catch and mortality of non-target species.
- Carefully revive, as possible, any injured bull or westslope cutthroat trout captured in nets.
- Incidental taking of the federally threatened bull trout will be documented. Maintain close communication with USFWS regarding acceptable levels of bull trout mortality.
- If bull trout mortality becomes excessive, gill netting will cease.

### *Wildlife, Threatened, Endangered and Species of Concern*

- The motorboat will be inspected daily for fuel and oil leaks prior to use. A Spill Prevention Plan will be developed and spill prevention materials will be kept on site for potential cleanup of spilled fuel or oil (such fluid spills are potential unnatural attractants to wildlife species).
- The boat motor will be selected, in part, to minimize noise.
- Helicopter use will be timed to minimize impacts on wildlife species and the flights will be included in the park's self imposed limit on the number of administrative flights permitted each year.
- The two flights required at the beginning of the project will occur in the late summer between the period one hour after sunrise and one hour before sunset. The 2 flights at

the end of the project will occur between the same time restrictions, no later than October 1 and no earlier than May 1 to minimize impacts to grizzly bears, (Aune and Stivers 1982, Waller 2002, Yates et al. 2001). Grizzly bear denning activity peaks during den emergence from 15 March to 15 May and during den construction from 15 October to 15 November. No flights will occur over known dens or potential den habitat during den emergence and den construction.

- Flight paths will be designated so as to avoid open alpine meadows, talus slopes, or other areas where grizzly bears congregate but will not have access to cover (this does not apply in winter). If a bear is seen in the area of the lake, the flight will be postponed. If the flight cannot be postponed, the flight will keep a maximum distance from the bear(s).
- The flight manager will also be responsible for coordinating with the park biologist to identify other sensitive sites prior to the flight.
- Helicopters will follow suggested flight paths away from sensitive areas. Where possible, flight paths will follow road corridors and over developed areas.
- All lethally taken lake trout or other fish mortalities will be disposed of by sinking in deep water to avoid creating an attractant to wildlife.
- Measures will be implemented to reduce potential for bear-human conflicts. Personnel will be required to adhere to park regulations concerning food storage and refuse management.
- Existing pit toilets will be utilized to eliminate human waste as a wildlife attractant.
- Biologists will monitor nest locations in the spring to determine if they are occupied for the season.
- "No-wake speed" will be maintained up to ½ mile from occupied eagle and/or loon nests.
- "No-wake speed" will be maintained for a ¼ mile from known eagle and/or loon foraging areas along the lakeshore.
- Biologists will monitor occupied nests during the entire spring operation. If disturbance is noted in the form of adults flushing from the nest or alarm vocalizations, the operation will be temporarily shut down until the adults return to the nest. Modifications will then be made to the operation if required, such as requiring the boat to only travel along the north shore, the use of non-motorized watercraft in sampling, or the use of night sampling at no-wake speed within ½ mile of occupied eagle or loon nests.

#### Water Resources

- A spill plan will be developed and followed in case of a fuel leak either on the ground or in the lake.

#### Natural Sound

- The motorboat will only be used during netting and hook-and-line operations.
- No-wake speed will be used within 300 yards of the patrol cabin and campground.

#### Visitor Use and Experience

- Signs will be posted at the trailheads to Quartz Lake and the backcountry permit office informing visitors of the motorized activity on the lake and information about the project.
- The helicopter will fly at a minimum of 2000 feet AGL over the park to reduce noise and disturbance except when it is delivering supplies via long line.



## ALTERNATIVES CONSIDERED

The environmental assessment (EA) evaluated two alternatives, No Action and the Preferred. Under the no action alternative the park would not conduct any research and implement any suppression actions to control lake trout in Quartz Lake.

### ***Environmentally Preferred Alternative***

Alternative B is the environmentally preferred alternative because it will best address criteria 1-4, as well as criteria 6. Criteria 5 is not directly applicable to this project. Successful implementation of Alternative B will provide for the long-term persistence of a native fish assemblage in Quartz Lake that is a key component in GNP's ecology, and represents the evolutionary legacy of aquatic communities in the ecosystem. Alternative B best meets the NPS trustee role as a steward of GNP's natural resources. Failure to act to attempt to eliminate or suppress lake trout in the Quartz Lake system will likely result in the loss of a significant proportion of GNP's remaining migratory bull trout resources in the Flathead River drainage portion of GNP and affect continued occupation of that area by other species such as common loons and bald eagles that feed on fish such as bull trout. Alternative B seeks to maintain the maximum productivity and diversity of the natural system, as well as its role in ecosystem processes. Traditional wilderness experiences and values will ultimately be preserved through successful implementation of the project as catching native westslope cutthroat trout, or simply knowing the native fish community in Quartz Lake remains in-tact, is one of the greatest intangible values of this project.

## WHY THE PREFERRED ALTERNATIVE WILL NOT HAVE A SIGNIFICANT EFFECT ON THE HUMAN

As defined in 40 CFR §1508.27, significance is determined by examining the following criteria:

### ***Impacts that may be both beneficial and adverse:***

The Preferred Alternative will have moderate, localized, short term, adverse impacts on fisheries, aquatics and threatened species and species of concern because of by-catch potential, but moderate, long term, beneficial regional impacts by maintaining a native fishery. Impacts on recommended wilderness will be minor to moderate, short term and long term adverse and beneficial, localized and regional from the use of a motorized boat in the recommended wilderness. However the benefits of maintaining the native fishery will persist for the long term and maintain wilderness values. Impacts on wildlife species will be negligible to minor, localized, short and long term and adverse during the operation and use of a boat during a time when visitation is usually low. Impacts will be beneficial, localized and long term by maintaining a native fishery. Impacts to gray wolves and grizzly bears will be negligible to minor, adverse and long term because project activity will take place during a time when these species are preparing for the winter. Impacts to common loons and bald eagles will be minor to moderate, adverse and beneficial, regional and short and long term because netting activity will take place during times they are nesting, but this project will also maintain their food source (shallow dwelling fish). Natural sound will experience minor to moderate short and long term adverse localized impact around the lake from the operation. Impacts to visitor use and experience will be minor to moderate, short term localized and adverse during the netting operation. However impacts will be beneficial and long term from preserving the native fishery.

***Degree of effect on public health or safety:*** No effect.

***Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas:***

The project area is located within recommended wilderness in Glacier National Park. It contains federally and state listed species (grizzly bear, gray wolf, bull trout, westslope cutthroat trout, bald eagle, and common loon).

Degree to which effects on the quality of the human environment are likely to be highly controversial:

Thirteen comment letters were received on the EA. Eight of these were supportive of the project. Two were opposed to the project because of impacts to resources and concern that impacts had not been adequately analyzed. Two other letters either had concerns about impacts from implementation of the project and or suggested other alternatives to consider. These concerns were addressed with additional mitigation described in the attached Response to Substantive Comments, and by changes made to the EA described in the attached Errata Sheet. Two actions (potential boat house construction and improvements to fish barrier) were also eliminated, thereby reducing the scope and activity within recommended wilderness. There was one story in the local newspaper announcing the availability of the EA. The project did not generate any other media interest. Furthermore similar projects have been conducted in the area and within Yellowstone National Park, with little controversy.

*Degree to which the possible effects on the quality of the human environment are highly uncertain or involve unique or unknown risks:*

This type of research and population reduction efforts on lake trout has been underway for at least the last five years in the rocky mountain west. Based on this history and experience, there are no unique or unknown risks associated with this project.

*Degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration:*

Information from this project will be used to determine if future action is worthwhile and warranted. Additionally environmental analysis will be conducted at that time.

*Whether the action is related to other actions with individually insignificant but cumulatively significant impact:* None.

***Degree to which the action may adversely affect districts, sites, highways, structures, or objects listed on National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources:***

There are no cultural resources that will be affected by the project.

***Degree to which the action may adversely affect an endangered or threatened species or its critical habitat:***

Impacts on the grizzly bear will be minor, adverse local and potentially long term because the project will take place when grizzly bears are ascending to higher elevations to construct dens. Under Section 7 the determination is "effect, not likely to adversely effect."

Impacts on the bull trout will be moderate, localized, short-term, and adverse because of potential for by-catch and moderate, regional, long-term beneficial due to the successful reduction and possible elimination of lake trout in Quartz Lake. Taking of bull trout might occur during netting operations. Bull trout "take" under the Endangered Species Act is covered under an existing programmatic Section 10 Recovery Permit (Number TE191853-0 issued by the USFWS on September 30, 2008).

Note: the EA analyzed impacts on gray wolves as a listed species, but since that time the gray wolf has been delisted.

***Whether the action threatens a violation of Federal, state, or local environmental protection law:*** None.

## **APPROPRIATE USE, UNACCEPTABLE IMPACTS, AND IMPAIRMENT**

Sections 1.5 and 8.12 of NPS *Management Policies* underscore the fact that not all uses are allowable or appropriate in units of the National Park system. The proposed use was screened to determine consistency with applicable laws, executive order, regulations, and policies; consistency with existing plans for public use and resource management; actual and potential effects to park resources; total costs to the National Park Service; and whether the public interest will be served. Bull trout are a native aquatic fish species to Glacier, listed as a threatened species by the United States Fish and Wildlife Service and is also a Species of Concern in Montana. They are part of an historic fishery that is fundamental to the biodiversity of the park. Protecting native fish resources is a high priority for the park's conservation and management programs. Protecting this fishery will also result in protection of the food source for two Montana species of concern, the bald eagles and common loon. The single, greatest threat to the persistence of bull trout on the west side of the park is the invasion and establishment of nonnative lake trout. This area of the park is also recommended wilderness and managed as such in accordance with NPS Policies. While wilderness values will be adversely affected in the short term, preservation of a native fishery will contribute toward maintaining wilderness values in the long term. Therefore the National Park Service finds that the preferred alternative is an appropriate use.

In analyzing impairments in the NEPA analysis for this project, the NPS takes into account the fact that if impairment were likely to occur; such impact would be considered to be major or significant under CEQ regulations. This is because the context and intensity of the impact would be sufficient to render what would normally be a minor or moderate impact to be major or significant. Taking this into consideration, NPS guidance documents note that "Not all major or significant impacts under a NEPA analysis are impairments. However, all impairments to NPS resources and values would constitute a major or significant impact under NEPA. If an impact results in impairment, the action should be modified to lessen the impact level. If the impairment

cannot be avoided by modifying the proposed action, that action cannot be selected for implementation.” “Interim Technical Guidance on Assessing Impacts and Impairment to Natural Resources” National Park Service, Natural Resource Program Center, July 2003. In addition to reviewing the definition of “significantly” under the NEPA regulations, the NPS has determined that implementation of the preferred alternative *will not* constitute an impairment to the integrity of Glacier National Park’s resources or values as described by NPS *Management Policies* (NPS 2006 §1.4). This conclusion is based on the NPS’s analysis of the environmental impacts of the preferred alternative as described in the EA with modifications described in this Finding of No Significant Impact decision document, the public comments received, relevant scientific studies, and the professional judgment of the Superintendent and Regional Director, guided by the direction in the 2006 NPS *Management Policies*. The EA identified less than major adverse impacts on fisheries and aquatic species, recommended wilderness, wildlife species, federally listed threatened and endangered species and species of concern, natural sound and visitor use and experience. Although the project has some negative impacts to recommended wilderness, wildlife species, natural sound and visitor use and experience, they are temporary and no more than moderate in intensity, and in all cases these negative impacts are the result of actions that will be taken to preserve, protect and restore these park resources and values for the long term. Overall, the plan results in benefits to park resources and values and opportunities for their enjoyment and does not result in impairment.

## **PUBLIC INVOLVEMENT**

The environmental assessment was made available for public review and comment during a 30-day period ending June 29, 2009. The announcement was also posted on the National Park Service’s public comment website. Letters were sent to the park’s mailing list for EAs, which includes various federal, state, and local agencies, including the U.S. Fish and Wildlife Service (USFWS), Montana Fish, Wildlife and Parks, the Montana State Historic Preservation Officer (MTSHPO), the Advisory Council for Historic Preservation (ACHP), the Blackfoot Tribal Business Council, and the Confederated Salish and Kootenai Tribe.

Thirteen comment letters and emails were received on the Environmental Assessment. Eight were very supportive of the project, two were against the project because of impacts to resources and concern that impacts had not been adequately analyzed. Two other letters either had concerns about impacts from implementation of the project and or suggested other alternatives to consider. Comments were also received from the US Fish and Wildlife Service, Flathead Audubon Society, Flathead Valley Chapter Trout Unlimited, Friends of the Wild Swan and Waterton Lakes National Park in Alberta Canada in addition to individual members of the public. Substantive comments and responses are attached.

The US Fish and Wildlife Service concurred with the park’s Biological Assessment and “may affect, not likely to adversely affect” determination on grizzly bear. Helicopter use will be in accordance with a 2008 Programmatic Biological Assessment on administrative flights which includes mitigation for time of day and time of year administrative flights are allowed. Additionally, the flights will be within the park’s self imposed annual administrative flight allowance (approximately 50).

## **CONCLUSION**

As described above, the preferred alternative does not constitute an action meeting the criteria that normally require preparation of an environmental impact statement (EIS). The preferred alternative will not have a significant effect on soils, vegetation, wildlife, threatened species, endangered

species, species of concern, historic structures, cultural landscapes, water resources, visitor use and experience, natural sound, recommended wilderness, visual resources, and health and safety. Environmental impacts that could occur from implementing the preferred alternative are limited in context and intensity, with generally adverse impacts that range from localized to widespread, short- to long-term, and negligible to moderate. Mitigation measures will be taken, as appropriate, to protect fisheries, wildlife, threatened and endangered species, species of concern, water resources, natural sound and visitor experience. No highly uncertain or controversial impacts, unique or unknown risks, significant cumulative effects, or elements of precedence were identified. Implementation of the action will not violate any federal, state, or local environmental protection law.

Based on the foregoing, it has been determined that an EIS is not required for this project and thus will not be prepared.

Approved:

*for* *Jaura D. Joss* 8/3/09  
Michael D. Snyder  
Regional Director, Intermountain Region

Date

# ERRATA SHEETS

## LARGE SCALE REMOVAL OF LAKE TROUT IN QUARTZ LAKE

### ENVIRONMENTAL ASSESSMENT

### GLACIER NATIONAL PARK

#### TEXT CHANGES

Strikeout is used to show the text that has been struck from the EA. Bold text is used to show the new text or new text that replaces the stricken text.

Throughout the EA, all references made to improving the existing fish barrier on Quartz Creek and potential to construct a boat house at Quartz Lake have been removed and are no longer under consideration at this time. It was determined that a boat house *will not* be necessary and more information is required before the park can determine if the barrier can be made to be effective. Another environmental analysis will be prepared if improvements to the barrier are proposed at a later date.

The gray wolf is no longer listed as a listed species under the Endangered Species Act. Therefore all references to it as a listed species are removed.

#### ***Page 25: Mitigation Measures***

The following mitigation measures were developed to minimize the degree and/or severity of adverse effects and would be employed as needed:

##### Fisheries

- Minimize handling stress and injury to native fish unavoidably captured. Quickly remove and release any captured bull or westslope cutthroat trout that appear alive and healthy.
- Check nets frequently to minimize mortality to non-target fish species.
- Use information gained from other lake trout removal projects to minimize catch and mortality of non-target species.
- Carefully revive, as possible, any injured bull or westslope cutthroat trout captured in nets.
- Incidental taking of the federally threatened bull trout would be documented. Maintain close communication with USFWS regarding acceptable levels of bull trout mortality. If bull trout mortality becomes excessive, gill netting would cease.

##### Wildlife, Threatened, Endangered and Species of Concern

- The motorboat would be inspected for fuel and oil leaks prior to use. ~~each day and A~~ **Spill Prevention Plan will be developed** and spill prevention materials would be kept on site for **potential** cleanup of spilled fuel or oil (such fluid spills are potential unnatural attractants to wildlife species).
- The boat motor would be selected, in part, to minimize noise.
- **Helicopter use will be timed to minimize impacts on wildlife species and the flights will be included in the park's self imposed limit on the number of administrative flights permitted each year.**
- **The two flights required at the beginning of the project will occur in the late summer between the period one hour after sunrise and one hour before sunset.**

The 2 flights at the end of the project will occur between the same time restrictions, no later than October 1 and no earlier than May 1 to minimize impacts to grizzly bears, (Aune and Stivers 1982, Waller 2002, Yates et al. 2001). Grizzly bear denning activity peaks during den emergence from 15 March to 15 May and during den construction from 15 October to 15 November. No flights will occur over known dens or potential den habitat during den emergence and den construction.

- Flight paths will be designated so as to avoid open alpine meadows, talus slopes, or other areas where grizzly bears congregate but will not have access to cover (this does not apply in winter). Flight paths will be designated so as to avoid open alpine meadows, talus slopes, or other areas where grizzly bears congregate but will not have access to cover (this does not apply in winter). If a bear is seen in the area of the lake, the flight will be postponed. If the flight cannot be postponed, the flight will keep a maximum distance from the bear(s).
- The flight manager will also be responsible for coordinating with the park biologist to identify other sensitive sites prior to the flight.
- Helicopters will follow suggested flight paths away from sensitive areas. Where possible, flight paths will follow road corridors and over developed areas.
- All lethally taken lake trout or other fish mortalities would be disposed of by sinking in deep water to avoid creating an attractant to wildlife.
- Measures would be implemented to reduce potential for bear-human conflicts. Personnel would be required to adhere to park regulations concerning food storage and refuse management.
- Regulations would be enforced that prohibit feeding of wildlife and require proper food and garbage storage.
- Existing pit toilets would be utilized to eliminate human waste as a wildlife attractant.
- Biologists would monitor nest locations in the spring to determine if they are occupied for the season.
- "No-wake speed" would be maintained up to ½ mile from occupied nests.
- "No-wake speed" would be maintained for a ¼ mile from known foraging areas along the lakeshore.
- Biologists would monitor occupied nests during the entire spring operation. If disturbance is noted in the form of adults flushing from the nest or alarm vocalizations, the operation would be temporarily shut down until the adults return to the nest. Modifications would then be made to the operation if required, such as requiring the boat to only travel along the north shore, the use of non-motorized watercraft in sampling, or the use of night sampling at no-wake speed within ½ mile of occupied eagle or loon nests. ,

#### **Water Resources**

- A spill plan would be developed and followed in case of a fuel leak either on the ground or in the lake.

#### **Natural Sound**

- The motorboat would only be used during netting and hook-and-line operations.
- No-wake speed would be used within 300 yards of the patrol cabin and campground.

#### **Visitor Use and Experience**

- Signs would be posted at the trailheads to Quartz Lake and the backcountry permit office informing visitors of the motorized activity on the lake and

information about the project. ~~eradication effort.~~

- The helicopter will fly at a minimum of 2000 feet AGL over the park to reduce noise and disturbance except when it is delivering supplies via long line.

#### Page 26-27: Alternatives Considered But Dismissed

An alternative submitted for consideration during the public comment period was to introduce large populations of cisco and lake whitefish of the type present in Crow Lake, Nester Falls, Ontario. This was considered but rejected for the following reasons. The well-intended introduction of non-native fish species are at the root cause of many of the problems native fish face across western North America, including Glacier National Park. Introducing new species to Quartz Lake in an attempt to suppress lake trout population growth comes with the potential for significant negative unintended consequences. These consequences include competition for food and space with native fish (i.e. mountain whitefish, sculpin, reidside shiner, westslope cutthroat trout) in relatively unproductive environments like Quartz Lake. Quartz Lake is not a closed system and any fish species introduced into Quartz Lake could migrate downstream and colonize other waters in the Flathead Basin. For these reasons, introducing additional fish species as a biological control was not considered as an option for Quartz Lake.

Another alternative considered utilized a combination of two motor boats, one approximately 18' long and the other approximately 26' long to capture lake trout using gill nets, conduct radio telemetry, and experimentally remove lake trout. The 18' boat would be used for radio tracking lake trout over an extended period of time (as well as for netting), and the bigger boat would be used for short duration (several weeks/year) intensive gill netting efforts in which large amounts of gill net are deployed to capture and experimentally remove lake trout (similar to Yellowstone or Swan lakes lake trout removal programs). Fuel for the boats would either need to be packed or flown in. These boats would allow for two 2-3 person crews to safely capture, tag, and track lake trout under a variety of weather conditions and seasons on Quartz Lake. It would also allow such a crew to safely and quickly deploy and retrieve large amounts of gill nets under a variety of weather conditions. This combination of boats is likely to offer the highest chance of success at eradicating/suppressing lake trout in Quartz Lake because the bigger boat would be equipped with hydraulics able to set and pull miles of gill net each day quickly, capturing more lake trout and at the same time reducing stress on any native fish captured in the nets incidentally through rapid deployment and retrieval of nets. This alternative was dismissed from further consideration due to the increased size of the boat and increase in impacts and the additional logistical issues.



Page 30, Table 1. Summary of Impact by Alternatives.

<b>Recommended wilderness</b>	Moderate, adverse, local and regional and long-term, impacts would be expected due to the loss of historic fishing opportunities in the recommended wilderness.	Minor to moderate, short-term and long term, adverse and beneficial, localized to regional impacts would be expected from the <b>4 helicopter trips and</b> use of a motorized boat in the recommended wilderness. However, the benefits of maintaining a native fishery under this alternative would persist for the long-term and maintain wilderness values.
<b>Species of Concern</b>		
<b>Common Loon</b>	Minor, long-term adverse and regional impacts would occur to common loons because they rely on shallow water dwelling fish for food like bull trout. Lake trout are deep water fish and would eventually out-compete bull trout, thus decrease the availability of food for loons.	Negligible to <b>Minor to moderate</b> , adverse, and beneficial, regional, short term and long term because shallow water dwelling fish that are native would be preserved. Short term adverse impacts would occur from gill netting activity on the lake <b>in the spring if nesting is taking place.</b>
<b>Bald Eagle</b>	Minor to moderate, long-term adverse and regional impacts would occur to bald eagles because they forage for fish in shallower waters. Lake trout are deep water fish and would eventually out-compete bull trout, thus decrease the availability of food for bald eagles.	Minor to <b>moderate</b> , long term adverse, beneficial, regional impacts from preserving shallow dwelling fish for food. Adverse impacts would be short term from gill netting activity on lake <b>in the spring if nests are active.</b>
<b>Natural Sound</b>	No effect	Minor to moderate, short-term and long term, adverse impacts would be localized around the lake during netting operations <b>and from the two flights to bring the boat into the site and two flights to remove it.</b>
<b>Visitor Use and Experience</b>	Negligible to moderate, localized, long-term, adverse impacts due to the degradation of fishing opportunities in a backcountry lake. The moderate threshold would address visitors who would like to fish or have fished Quartz Lake in the past. The negligible threshold would address visitors who do not fish.	Minor to moderate, short-term, localized, adverse impacts to visitors would occur during netting operation for the length of the project <b>and from the two flights to bring the boat into the site and two flights to remove it.</b> However, upon completion of the project the area would appear no different than before the project began, which would result in long-term, moderate, beneficial impacts to visitor use and experience.

## Recommended Wilderness

### IMPACT ANALYSIS OF ALTERNATIVE B – THE PREFERRED

According to GNP's 2003 *Backcountry Management Plan* (NPS 2003), "the use of motorized tools, boats, or aircraft will be kept to a minimum in the backcountry and utilized only for safety, extraordinary need, and administrative purposes, when no other means is feasible. All uses will be carefully considered balancing disturbance against need."

Section 4(c) of the 1964 Wilderness Act states: " Except as specifically provided for in this Act, and subject to existing private rights, there shall be no commercial enterprise and no permanent road within any wilderness area designated by this Act and, except as necessary to meet minimum requirements for the administration of the area for the purpose of this Act (including measures required in emergencies involving the health and safety of persons within the area), there shall be no temporary road, no use of motor vehicles, motorized equipment or motorboats, no landing of aircraft, no other form of mechanical transport, and no structure or installation within any such area."

Under Alternative B, the use of a motorized boat to protect a threatened species and prevent the spread of an invasive species (lake trout) **and the use of a helicopter for 4 flights (2 at the beginning of the project and 2 at the end of the project)** would be an acceptable result in minor to moderate, short-term adverse impact from motorized disturbance that would prevent a species from extirpation and preserve a wilderness characteristic for future generations. Motorized **boat** use would create noise during netting operations, the viewshed would be disrupted by the presence of the boat, whether on the water or stored by the cabin, and the presence of a field crew might infringe on wilderness solitude. **Noise and the presence of a helicopter bringing in two slingloads at the beginning of the project and removing two slingloads at the end of the project for a total of 2 days would result in minor to moderate short-term, local adverse impacts on wilderness characteristics. However,** preservation of a native fishery would have a moderate, long term, regional beneficial impact on wilderness experience, **characteristics and values.**

#### Cumulative Impacts of Alternative B

Cumulatively, this alternative would have localized to widespread, minor to moderate, adverse, and short and long-term impacts on recommended wilderness **characteristics, experience and values** when considered with past, present and future administrative flights, trail maintenance and visitor use in recommended wilderness areas.

#### Conclusion

Impacts to recommended wilderness under Alternative B would be localized to widespread, minor to moderate, adverse and beneficial and short and long term impacts due to the use of a motorized boat and gill netting operation on a lake within recommended wilderness, **up to four helicopter flights to deliver and remove the boat**, and eventual restoration and preservation of the native fishery. Cumulative impacts would be the same.

Because Alternative B would not result in major adverse impacts to recommended wilderness resources, whose conservation is 1) necessary to fulfill specific purposes identified in the park's enabling legislation, 2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park, or 3) identified as a goal in the park's *General Management Plan* or other relevant NPS planning documents, there would be no impairment of park wilderness resource values related to this alternative. Implementation of this alternative would not result in any unacceptable impacts and is consistent with §1.4.7.1 of NPS *Management Policies* 2006.

**Common Loon.** The hook-and-line fishing would take place during the egg laying period. Nests are often located in tall grasses. Common loons may select nest sites along the shores of Quartz Lake that would be inconspicuous to staff conducting the hook-and-line fishing operation. Human disturbance at nest and nursery sites could cause brood failure through egg or nest abandonment. **Even with implementation of mitigation actions that include biological monitoring of spring nesting activity and bird behavior during netting, operating boats at no-wake speed in areas near nesting and foraging, maintaining a ¼ distance from foraging and nesting areas as much as possible, impacts would be** ~~Without mitigation actions, project operations conducted during the spring could have site specific, moderate, adverse, short and long term impacts on loons, however mitigation actions would be implemented reducing the impacts to negligible to minor, adverse, regional, long-term.~~

**Bald eagles.** Nest areas are critical, and human activity or development may cause abandonment of the breeding area, affect successful completion of the nesting cycle, and reduce productivity. Designated nest areas extend within a 0.25-mile (400 m) radius of all nest sites that have been active within 5 years. The objectives of designating nest-site areas are to minimize human disturbance and to maintain or enhance nest-site habitat suitability.

Bald eagles are especially sensitive to human disturbance during the breeding period (Hamann et al. 1999). The breeding period includes courtship, late February to mid-April; egg laying and incubation, late March to late May; nestling, mid-May to early August, and fledging, early August to late September (least sensitive period). Effects of disturbance on breeding birds during incubation include short-term nest abandonment or nest desertion resulting in exposure of the eggs to detrimental temperature extremes and predators (Hamann et al. 1999). Disturbance during rearing can result in trampling of young, young jumping or falling from nests before they can fly, and/or separation of young from parents. Chronic disturbance can cause nest abandonment. The potential for nest failure and nestling death due to human disturbance is reduced, but not eliminated, after nestlings reach an age of about 4 weeks (usually early to late June in GNP). Nestlings usually fledge at 10 to 12 weeks of age (by mid-Aug.); young eagles migrate from breeding areas between mid-September and early October (McClelland et al. 1996). Outside of the breeding season, disturbance by humans may cause birds to change their feeding habits, thereby reducing normal food intake (Hamann et al. 1999). Activities proposed would take place during the spring nestling period and fall migration period. **Even with mitigation measures that would direct project activities away from sensitive areas and biological monitoring to determine if nests are active and monitoring of birds during the project, would reduce the possibility of disturbance so that impacts would be minor to moderate, short and long-term, adverse and beneficial, and regional because a portion of the project would occur during the nesting season. The impacts would also be beneficial because removal of lake trout would preserve a food source for eagles that rely on fish such as bull trout that live in shallower waters.**

#### **Common Loon**

Actions proposed in combination with past, ongoing, and future activities would be insufficient to increase the impact level beyond that identified for the preferred alternative alone; ~~negligible to~~ minor **to moderate**, adverse, regional, and long-term.

#### **Bald eagle**

Actions proposed in combination with past, ongoing, and future activities would be insufficient to increase the impact level beyond that identified for the preferred alternative alone; minor to **moderate**, adverse, regional, and long-term.

## Conclusion

Alternative B would have negligible to minor effects on wolves, grizzly bears, **and minor to moderate impacts on loons, and eagles**. These are all wide-ranging species so effects range from local to regional. Impacts on grizzly bears and gray wolves would be adverse and long term because the netting activity would take place during a time when human activity is usually low and both species are preparing for the winter. Impacts on the common loon and bald eagle would be adverse and beneficial and short and long term because while they would be affected by the netting operation, in the long term the actions would maintain the native fishery and their food source. Under Section 7, the determination would be "effect, not likely to adversely affect" for ~~grey wolves and grizzly bears~~. Because this alternative would not result in major adverse impacts to threatened, endangered or species of concern resources, whose conservation is 1) necessary to fulfill specific purposes identified in the park's enabling legislation, 2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park, or 3) identified as a goal in the park's *General Management Plan* or other relevant NPS planning documents, there would be no impairment of park threatened, endangered or species of concern resource values related to this alternative. Implementation of this alternative would not result in any unacceptable impacts and is consistent with §1.4.7.1 of NPS *Management Policies* 2006.

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## Natural Sound

### IMPACT ANALYSIS OF ALTERNATIVE B – THE PREFERRED

The preferred alternative would result in moderate impacts to natural sound during the netting operation while the motorized boat would be in use **and from the two flights required to bring the boat into the site and eventually the two flights to remove it**. The majority of the time the engine of the motor boat would be operating at its lowest speeds, generating as little noise as possible. However, given the remote setting and high level of quietude, this noise would be highly audible and could adversely affect nearby visitors. Field crews would be present during times (October – November) when human presence is usually low to non-existent. This would be an additional impact but would not elevate the level of impact. The preferred alternative would have localized, moderate, short-term, and adverse impacts to the natural soundscape of the Quartz Lake area.

### Cumulative Impacts of Alternative B

Cumulatively, this alternative would have localized to widespread, minor to moderate, adverse, and short and long-term impacts on natural sound when considered with scenic air tours, administrative flights, trail maintenance **including a few days of chainsaw work once a year**, and visitor use in recommended wilderness areas.

### Conclusion

The impacts of Alternative B on natural sound resources would be minor to moderate, adverse, and localized, short and long-term because of the addition of 10-12 weeks of activity and noise at the project site, **including bringing the boat into the site by helicopter**.

Because Alternative B would not result in major adverse impacts to natural sound resources, whose conservation is 1) necessary to fulfill specific purposes identified in the park's enabling legislation, 2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park, or 3) identified as a goal in the park's *General Management Plan* or other relevant NPS planning documents, there would be no impairment of park natural sound resource values related to this alternative. Implementation of this alternative would not result in any unacceptable impacts and is consistent with §1.4.7.1 of NPS *Management Policies* 2006.

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## VISITOR USE AND EXPERIENCE

### IMPACT ANALYSIS OF ALTERNATIVE B – THE PREFERRED

Under Alternative B, native fishing opportunities would be protected in Middle Quartz, Quartz, and Cerulean lakes. The use of a motorized boat, the two flights that would be needed for delivery of the boat and the presence of a field crew for an extended period of time would diminish the wilderness experience being sought by visitors. The trailhead and backcountry permit office would be posted with a notification of operations occurring at Quartz Lake to inform visitors of what is occurring to mitigate actions in the preferred alternative that might interfere with visitor use and experience. In general, visitors would experience minor to moderate, short-term, adverse impacts from **the two helicopter flights, the motorized boat and presence of a field crew**. However this experience could also have long-term impacts which could be beneficial if they understand the importance of preserving a native fishery or adverse if they were seeking a non-motorized wilderness experience. Overall, impacts to visitor use and experience would be minor to moderate, adverse, and short-term because of the presence of the motorized boat but would also be long-term beneficial by protecting the native fishery.

#### **Cumulative Impacts of Alternative B**

The impacts of Alternative B combined with other activities present at the lake such as trail work would have negligible to moderate, beneficial and adverse, short and long term localized impacts on visitor experiences because of potential disturbance caused by the project activity and other activities in the area and long term preservation of the native fishery.

#### **Conclusion**

Impacts on visitor experience from Alternative B would be minor to moderate, short-term, localized adverse impacts to **visitors from the noise and activity required to deliver the boat by the use of two helicopter flights, and the 2 flights required to eventually remove the boat, the netting operation for the length of the project, the increased activity in the area to conduct the operation and up to one week of trail crew activities in the area, including a few days of potential chainsaw work each year**. Visitors would benefit from the information provided at the trailhead on the purpose of the project and description of the operation. Upon completion of the project, the area would appear no different than before the project began.

## RESPONSE TO SUBSTANTIVE COMMENTS ON THE EA

The response is in italics and bold.

1. **COMMENT/RESPONSE:** Both bald eagles and common loons are wildlife species of concern to FAS and neither species has any mitigation measures specified in the Preferred Alternative although both species are known to be susceptible to human and motorized activities. Specific mitigation measures need to be spelled out with details on when and where they are to be applied and who is responsible for carrying them out. *Mitigation measures to mitigate impacts on loons and eagles were inadvertently left out. They have been added (see Errata Sheet) and the Preferred Alternative beginning on page 2 of this Finding of No Significant Impact.*
2. **COMMENT/RESPONSE:** The issue of possibly building a boat house is glossed over without adequately analyzing the effects. Will a separate EA be required? If not, then who will decide whether to build a boathouse, and what criteria will be used? *The proposed boat house has been eliminated from the proposal for the project. Historically, Quartz Lake Cabin had a boat house which was sunk in the Lake in 1970's. However, the park now believes that the boat can be adequately protected during the winter without constructing a new boat house.*
3. **COMMENT/RESPONSE:** Does this EA cover just a trial effort to determine if the proposed project can be successful to control lake trout or does it also include a continuing similar project for many years to come? *The EA analyzed a 4 year project. Within the 4 year timeframe, we intend to determine the long-term feasibility of lake trout removal or suppression. In consideration of other ongoing lake trout suppression projects outside of the park, one potential outcome would be a recommendation to implement long-term suppression efforts of lake trout in the Quartz Lake system, beyond the 4 year experimental study. At that time, additional environmental compliance would be initiated. We have taken a second look at the impact analysis on wilderness and believe that the analysis in the EA is still valid and not understated. This is one lake within almost 1.3 million acres of recommended wilderness. It is a relatively short term study for a portion of the year. ???*
4. **COMMENT/RESPONSE:** The analysis of the fish barrier construction/reconstruction is very skimpy. The multiple helicopter trips, source of materials, length and timing of construction activities, and sediment production from construction are either not mentioned at all or quickly passed over without thorough analysis. This whole aspect of the proposed project is barely mentioned in the description of the Proposed Action on pages 22-25 and no mitigation measures are described for this portion of the proposed project. An improved analysis of all aspects of this portion of the proposed project is needed to allow an informed decision. *Improvements to the fish barrier have been deleted from further consideration in this EA. Further research and additional design/evaluation is required. If the park decides to pursue improvements to the existing barrier that were not analyzed or proposed in the 2004 Proposal to Construct a Fish Barrier on Quartz Creek Environmental , a new environmental analysis will be conducted.*

5. **COMMENT/RESPONSE:** The EA is largely devoted to discussing the use of a motorboat on the lake but appears to inadequately address both short-term and long-term effects to the wilderness character of the area and users of the area. *Impacts to recommended wilderness were addressed on pages 49-51, but have been added to. See Errata Sheet. Wilderness character will be impacted adversely at a minor-moderate level by the use of a motorized boat on Quartz Lake and the 4 helicopter trips (2 at the beginning of the project and 2 at the end to deliver and remove the boat). However, this activity does not change the character of the entire recommended wilderness within Glacier National Park and therefore does not reach the level of a "major" impact. The cost of not using the boat will likely be the eventual loss or severe degradation of the native fishery of Quartz Lake. The potential loss of the native fishery also impacts wilderness values and the basic ecological integrity of the Quartz Lake ecosystem. If the project is not successful, the boat will be removed, thus restoring natural sounds to the lake area. If it is successful, then on balance, more will have been gained than lost in meeting the parks mandate to conserve both natural resources and wilderness values.*
6. **COMMENT/RESPONSE:** FAS (Flathead Audubon Society) requests that a revised EA be prepared that address the points of concern discussed in our comments. *The comments and concerns have been addressed in this FONSI and a revised EA is not necessary.*
7. **COMMENT/RESPONSE:** *The EA does not disclose what "improvements" were made to the barrier design and how that would make it more effective. What the EA does disclose is that the barrier won't be effective during high water and lake trout would still be able to move through the system. See response to #4 above.*
8. **COMMENT/RESPONSE:** *The EA does not analyze the cumulative effects of finishing construction of the barrier which would require 10-15 helicopter trips to bring rock to the site. When will this be done? How long will barrier construction take? How many pack trips will also be required? What noise and disturbance will this cause? See response to #4 above.*
9. **COMMENT/RESPONSE:** *The EA casually mentions that there may need to be construction of a building to house the boat. What size will it be? How will tools and materials be brought to the site? How much clearing would need to be done? Will this be done concurrent with other work such as finishing construction of the barrier, netting and boat noise, etc.? Will it be dismantled when the netting project is finished? See response to # 2 above.*
10. **COMMENT/RESPONSE:** *The EA discloses that it will take two helicopter trips to bring in the boat. What is the timing and cumulative effects of these trips along with the 10-15 helicopter trips to bring in rock, construction of the boat building and boat noise on the lake. See errata sheet for changes to the impact analysis under Natural Sound that addresses these concerns.*
11. **COMMENT/RESPONSE:** *We are especially concerned about whether this project will be successful since lake trout have been allowed to invade Quartz Lake for over five years. Has any data been gathered about whether lake trout have already invaded Cerulean Lake? We have fully supported the lake trout netting on Swan Lake, however, the delay of 10 years from when the first lake trout was confirmed in the lake and when the first netting that actually removed lake trout allowed these non-native fish to migrate up the Swan River to Lindbergh Lake. The similar delay by the Park*

Service to stop the influx of lake trout in Quartz Lake may render your intent moot. ***Gill netting from a non motorized boat on Cerulean Lake in 2004 as part of a bull trout life-history research project did not result in the capture of any lake trout. Angling did not result in the capture of any lake trout in Cerulean Lake in 2009. Therefore we conclude that lake trout may not be present in Cerulean Lake. Glacier National Park believes this project has a reasonable chance of success in reducing the population of lake trout to a size that will allow the bull trout population to thrive and survive.***

12. **COMMENT/RESPONSE:** The recently ***completed Environmental Assessment*** for removal of lake trout from Swan Lake stated: "Because existing equipment (state, federal, and Tribal) is inadequate to efficiently handle large numbers of fish, professional fishery consultants are ***required.***" ***If existing equipment is inadequate on Swan Lake and netting requires professional fishermen*** with specialized gear, why do you think it will be adequate on Quartz Lake? ***We have chosen an experimental approach to assessing lake trout status and the feasibility of removal of lake trout from Quartz Lake. We recognize that a larger operation (similar to Swan Lake and others) could offer a higher likelihood of success in lake trout removal, and we considered and analyzed this in the Minimum Tool Analysis attached to the Environmental Assessment (pages 71-81 in the EA). See Errata sheet as well as we have added this alternative to Considered But Rejected. We do not have basic information to determine how large the lake trout population/problem is in Quartz Lake currently. In addition, budget and logistical limitations were substantial considerations in designing this study. Through the Minimum Tool Analysis process we determined that an intermediate level of effort would be sufficient to address our current research and management questions.***
13. **COMMENT/RESPONSE:** We support ***keeping native fish viable***, however, we are concerned that GNP waited too long and may have already jeopardized the native fish in the Quartz Lakes and Cerulean Lake. The dilemma is whether finishing the barrier, building a boat house, using ***motorized vessels on a wilderness lake and multiple helicopter trips is a worthwhile trade-off if the integrity of native fish in this system is already compromised beyond repair? How will you evaluate success? See paragraph 3 on page 24. Improvements to the existing barrier have been deleted from further consideration in this environmental assessment.***
14. **COMMENT/RESPONSE:** ***Curiously, I found no analysis on the impacts of the technical crew living by the lake (visibility, human waste disposal, etc) or the impacts of increased stock traffic on the trail. I don't think this is a fatal flaw of the EA but urge the planners to consider this. The presence of the crew was analyzed on page 50, 52, 58, 59, 61 and 63. They will be staying in the Quartz Lake Cabin which is where park personnel stay when performing work in the backcountry in that area. There is a pit toilet nearby. We anticipate 2-3 stock trips into Quartz Lake in support of the project.***
15. **COMMENT/RESPONSE:** ***My only fear utilizing the proposed methodology is the effect that by-catch will have on the existing populations of native bull and cutthroat trout. Please see the bottom of page 45 and the top of page 46 in the EA for an explanation of how the by-catch concern will be addressed.***
16. **COMMENT/RESPONSE:** ***The solution to your problem with excessive lake trout populations is as follows:***



**1) Introduce large populations of cisco and lake whitefish of the type present in Crow Lake, Nester Falls, Ontario. This suggestion was considered and added to Alternatives Considered but Dismissed from Further Consideration. See Errata Sheet.**

**2) Use standard seines soon after iceout to remove large lake trout in shallow water. See page 23 of the EA as this was noted as a time netting would also occur.**

**3) Allow Lake trout fishing year round with no possession limits. There are no limits on lake trout possession in Glacier National Park west of the Continental Divide. They were removed in 2008 in response to the desire of the NPS to remove as many lake trout as possible from park waters west of the Continental Divide using anglers.**

To justify the proposed actions listed above please read L. M. Carl's paper entitled "Lake trout demographics in relation to burbot and coregonine populations in the Algonquin Highlands, Ontario". The predator-prey relation between cisco and lake whitefish is such that these fish eat the larve of lake trout. In turn lake trout eat these food fish in both shallow and deep water. To be successful one must aid must the actions of these plankton and larve eating food fish!

**The well-intended introduction of non-native fish species are at the root cause of many of the problems native fish face across western North America, including Glacier National Park. Introducing new species to Quartz Lake in an attempt to suppress lake trout population growth comes with the potential for significant negative unintended consequences. These consequences include competition for food and space with native fish (i.e. mountain whitefish, sculpin, redbside shiner, westslope cutthroat trout) in relatively unproductive environments like Quartz Lake. Quartz Lake is not a closed system and any fish species introduced into Quartz Lake could migrate downstream and colonize other waters in the Flathead Basin. For these reasons, introducing additional fish species as a biological control was dismissed from further consideration.**

**17. COMMENT/RESPONSE:** I agree that the presence of Lake Trout in Quartz Lake is an ecological tragedy. However, the probability of actually eliminating the species from Quartz Lake must be near zero. Therefore, the EA should have discussed more accurately the effects of permanent intrusion of motor boat and associated project noises to the Lake environment. The EA states that "Impacts on recommended wilderness would be minor to moderate . . ." This is a substantial underestimate of the presence of project noises at Quartz Lake, in spring, summer, and fall, permanently. **See #5 above. Furthermore we believe that based on the professional opinions of four fisheries biologists, this project does have a reasonable chance of success. This is a four year study and operation. If a permanent operation is proposed after this, further environmental analysis will be conducted.**

- 18. COMMENT/RESPONSE:** On Page 60, The EA repeats NPS rhetoric on "natural sound," stating: "The project area is found entirely in the backcountry zone of the park (NPS 1999). The backcountry zone is dominated by natural quiet. About 95% of the park is recommended wilderness where natural quiet is considered an important resource. Scenic air tours may still be heard on occasion but, for the most part, other artificial noise would not be detectable; only the natural sounds preserved in wilderness areas." What? Motorboat noise would not be detectable??? ***Impacts on natural sound and visitor experience from motorboat noise, temporary helicopter use and the field operation were analyzed on pages 61 and 63 of the EA.***
- 19. COMMENT/RESPONSE:** As well as helicopter overflights, the sounds from NPS trail crew chain saws should have been mentioned. ***See errata sheet. Trail crew work was analyzed under cumulative impacts, but specific mention of chain saws has been added.***
- 20. COMMENT/RESPONSE:** The EA's Conclusion reads: "Impacts on visitor experience from Alternative B would be minor to moderate, **short-term, localized adverse impacts to visitors from the netting operation for the length of the project.**" I can understand that the proponents of this project want to minimize ***the apparent significance of the impacts they will be creating, but this conclusion is too sanitized to be a truthful characterization. See errata sheet for additional information to support this conclusion.***