# Native Fish Conservation and Recovery Efforts in Glacier National Park: Approaches, Tools, and Priorities

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# Partnerships



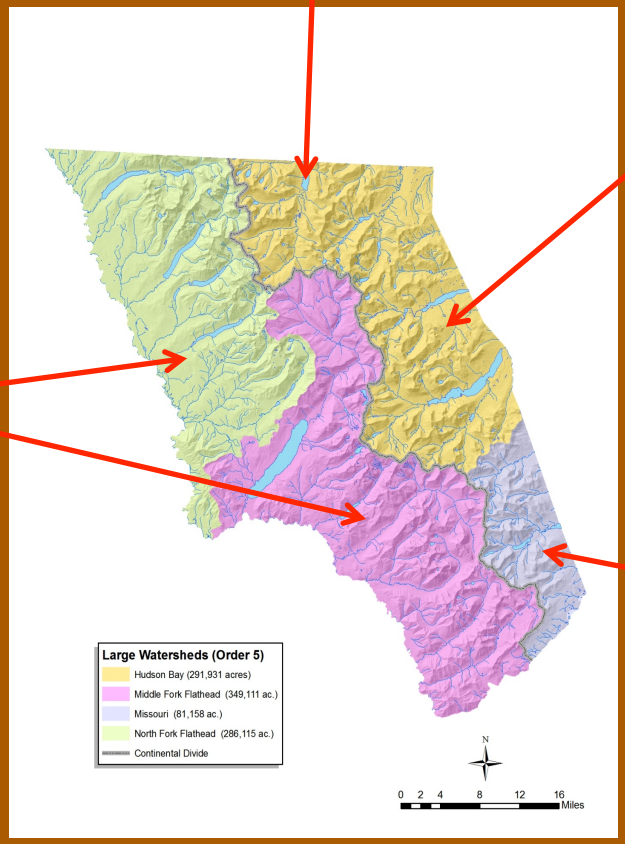



# Native Fish Distribution

Lake Trout/Bull Trout
Lake and pygmy whitefish
Burbot
Longnose sucker
Deepwater Sculpin
Mysis

Lake Trout/Bull Trout
Westslope cutthroat
Mountain and lake whitefish
Northern pike
Burbot
Suckers
Minnows
Sculpin

Bull trout
Westslope cutthroat
Mountain whitefish
Pygmy whitefish
Suckers
Northern pikeminnow
Sculpin




Westslope cutthroat
Mountain whitefish
Suckers
Sculpin

# Approaches

## Reacting to Crisis /Opportunity versus Planning

and

# Glacier National Park Fisheries Management Plan

## Alternative A

- Status quo
- Project by project

## Alternative B

Remove non-native fish using:

- Piscicide (fish toxin)
- non-motorized mechanical methods
- motorized netting and/or trapping

Construct additional fish passage barriers where needed to block non-native fish access.

Restore some historically fishless waters to a fishless condition.

Translocate native fish to areas with secure habitat (habitat refugia).

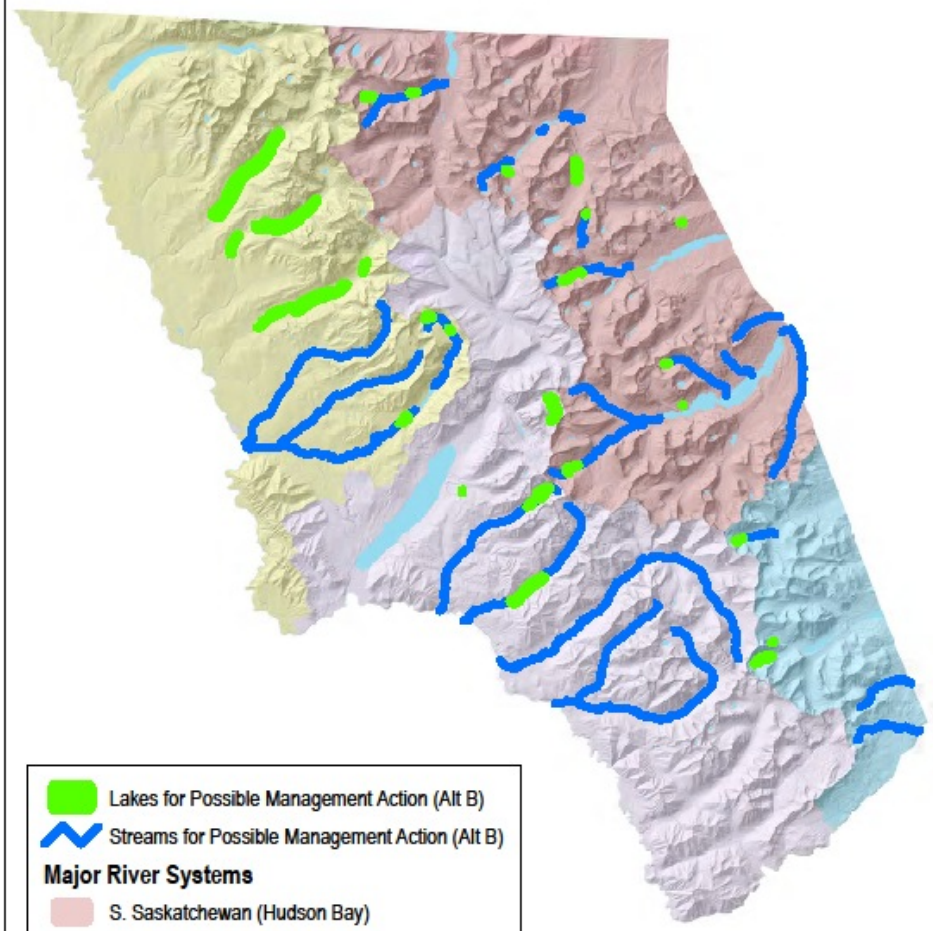
## Alternative C

Remove non-native fish using non-motorized mechanical methods.

Restore historically fishless waters to a fishless condition where possible.

Park Waters Having Aquatics Conservation and Management Action

# Waters Considered for Treatment
# Alternative B: Tables 2-1, 2-2

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Date: 3/12/2018

# Prioritization Examples

1. Isabel Lake – pure bull and westslope cutthroat isolated above natural waterfalls.

2. Quartz Lake – high degree of conservation value with direct and measurable benefits anticipated

3. Gunsight Lake/Upper St. Mary River – Rainbow trout upstream of several populations of westslope cutthroat trout

4. Lakes Francis and Janet – rainbow trout upstream of some native fish species, but pose very low risk. Potential for habitat refugia for native fish

# Annual Fish Loss in the St. Mary Canal

| | 2,421 Netting Hours | | Estimated Annual Loss | |
|---|---|---|---|---|
| **Species** | **Total Catch** | **Catch Rate** | **Low** | **High** |
| Bull Trout (BLT) | 207 | 0.086 | 471 | 661 |
| Cutthroat x Rainbow Trout (CTTxRBT) (Cutthroat and Rainbow Hybrids) | 263 | 0.109 | 597 | 838 |
| Brook Trout (BKT) | 2 | 0.001 | 6 | 8 |
| Lake Trout (LKT) | 5 | 0.002 | 11 | 15 |
| Mountain Whitefish (MWF) | 1,834 | 0.758 | 4,150 | 5,825 |
| Lake Whitefish (LWF) | 67 | 0.028 | 153 | 215 |
| Burbot (BUT) | 3,294 | 1.361 | 7,452 | 10,458 |
| Northern Pike (NOP) | 18 | 0.007 | 38 | 54 |
| Suckers (SUC) (Longnose, Mountain, White) | 2,780 | 1.148 | 6,285 | 8,822 |
| Trout-perch (TRP) | 120 | 0.050 | 274 | 384 |
| Longnose Dace (LND) | 1,111 | 0.459 | 2,513 | 3,527 |
| Sculpin (SCP) (Mottled, Spoonhead) | 246 | 0.102 | 559 | 784 |
| Lake Chub (LKC) | 4 | 0.002 | 11 | 15 |
| Pearl Dace (PLD) | 29 | 0.012 | 66 | 92 |
| **All Fish Combined** | **9,980** | **4.122** | **22,570** | **31,670** |

U.S. Fish and Wildlife Service 2011

# Restoration/Conservation Tools

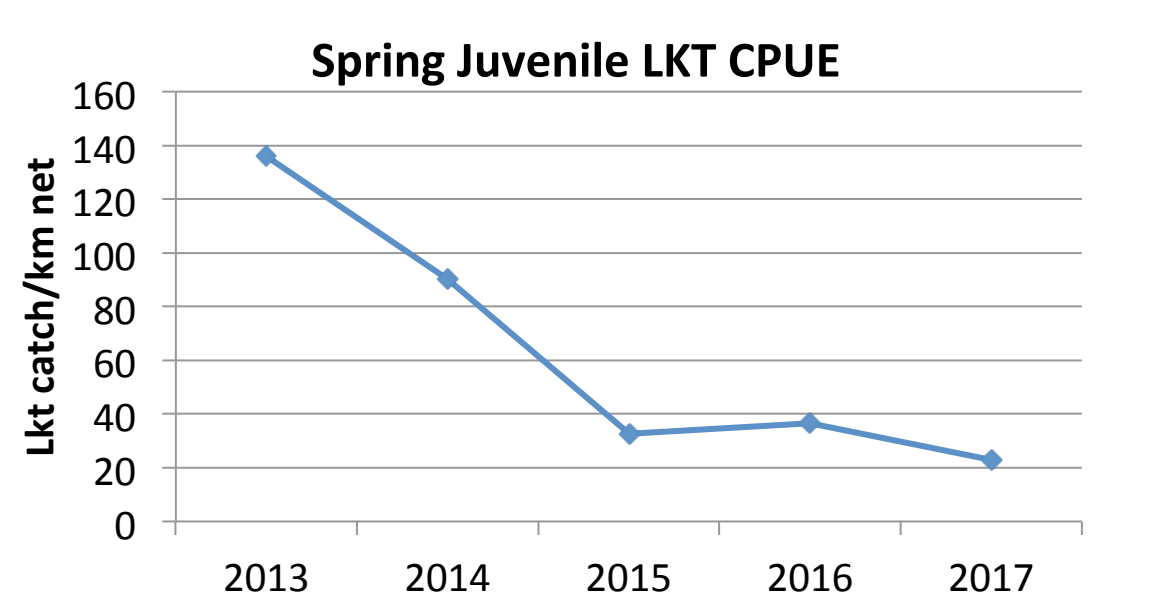
Mechanical Removal in Lakes

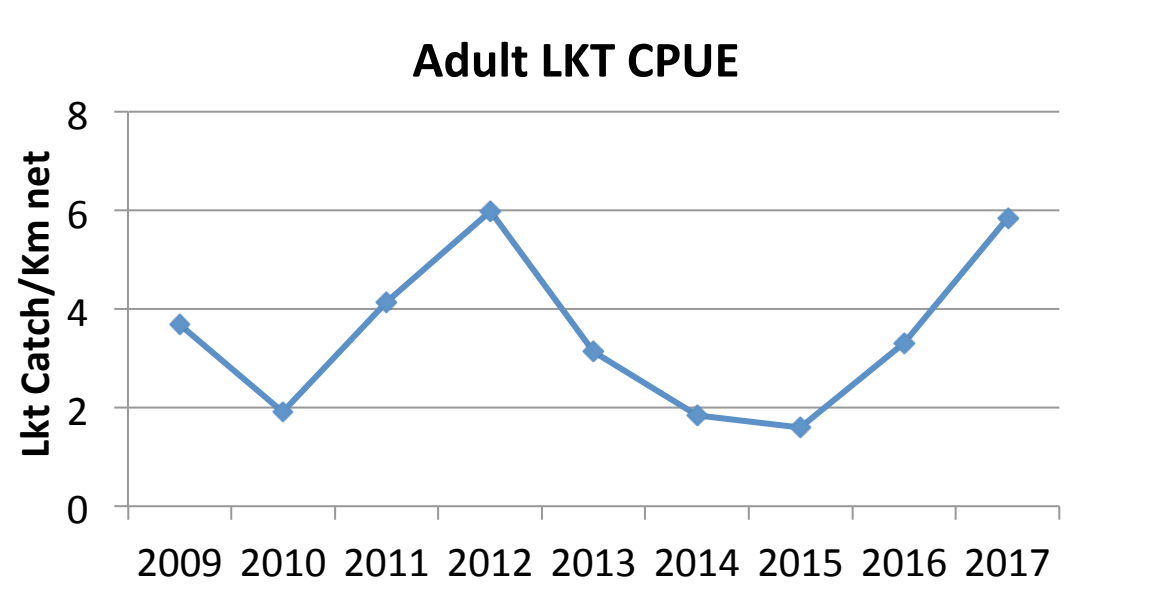
Example: Quartz Lake

Pros: Selective removal of non-natives

Cons: Costly, labor intensive, long time to evaluate and potentially forever

# Quartz Lake Project



# Restoration/Conservation Tools Cont.

Mechanical Removal in Streams

Example: Midvale Creek

Pros: selective removal, non-chemical

Cons:  difficult to achieve 100% success, labor intensive

# Midvale Results

- 2009: 1/13 hybrids – recent invasion, pure fish still remain
- 2010: 6/73 hybrids – removed all suspected hybrids captured
- Need to resample in 2018

# Construction of Back-country Fish Passage Barriers



Pros: build in areas without road access

Cons: Labor intensive, local disturbance, require frequent and often substantial maintenance, long-term effectiveness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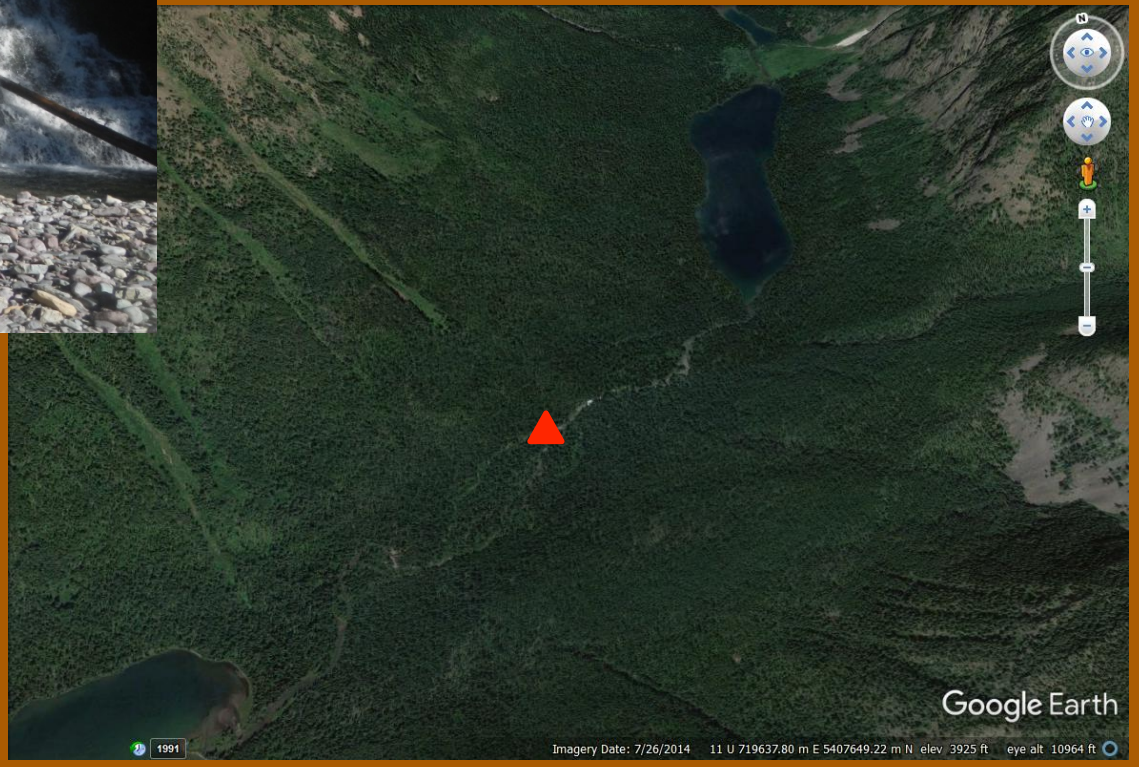
10.12.2011

# Logging Lake Lake Trout Removal and Grace Lake Translocation



# Egg Take and Conservation Rearing – Quartz Lake Donor

## Fish Translocation

Pros:

- work-around for potential failure of various invasive removal approaches or other habitat problems that are difficult to resolve
- Finite effort – it works or it doesn't
- We have lots of experience with it
- Relatively inexpensive

Cons:

- Impacts to amphibians/invertebrates
- Law of unintended consequences
- Perception we are repeating mistakes of the past


Creston National Fish Hatchery
Kalispell, Montana

# Questions?

# Alternatives and Tools

A. No Action – Continue project by project NEPA analysis and implementation

B. Remove non-native fish using the maximum number of tools and approaches available to fish managers and evaluate use of new and developing technologies
   - motorized/mechanical removal
   - chemical removal
   - additional fish passage barriers
   - translocation into existing fish-bearing waters

C. Non-motorized, non-chemical option
   - mechanical removal using backpack shockers
   - mechanical removal using nets from non-motorized watercraft
   - no new fish passage barriers
   - no translocation

# Tiered Prioritization

1. Protect secure, genetically pure “core” (Muhlfeld et al. 2016), bull and westslope trout populations

2. Waters where non-native fish are present and pose a direct threat to “conservation” (Muhlfeld et al. 2016) populations of bull and westslope cutthroat trout. Anticipated benefits are direct and high.

3. Waters where there is a lower threat to native fish species from the presence of non-native fish, but where management action could reduce the risk of hybridization with native species or provide native fish with habitat refugia and, therefore, some level of security from the effects of a warming climate. Indirect benefits and/or less certainty.

4. Little or no threat of non-natives to native fish species but could provide climate refugia for native species

# Glacier National Park Fisheries Management Plan

Environmental Impact Statement

Guide native fish conservation and restoration for the foreseeable future

Park-wide adaptive approach

Currently analyzing impacts for three alternatives

Anticipated completion in early 2019

Completed NEPA for a suite of potential actions and tools across the landscape