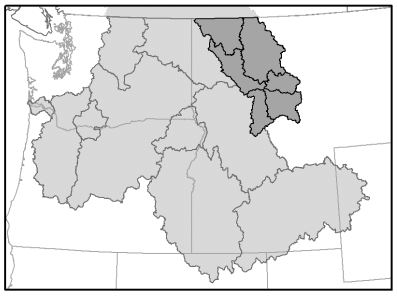
Mountain Columbia Province

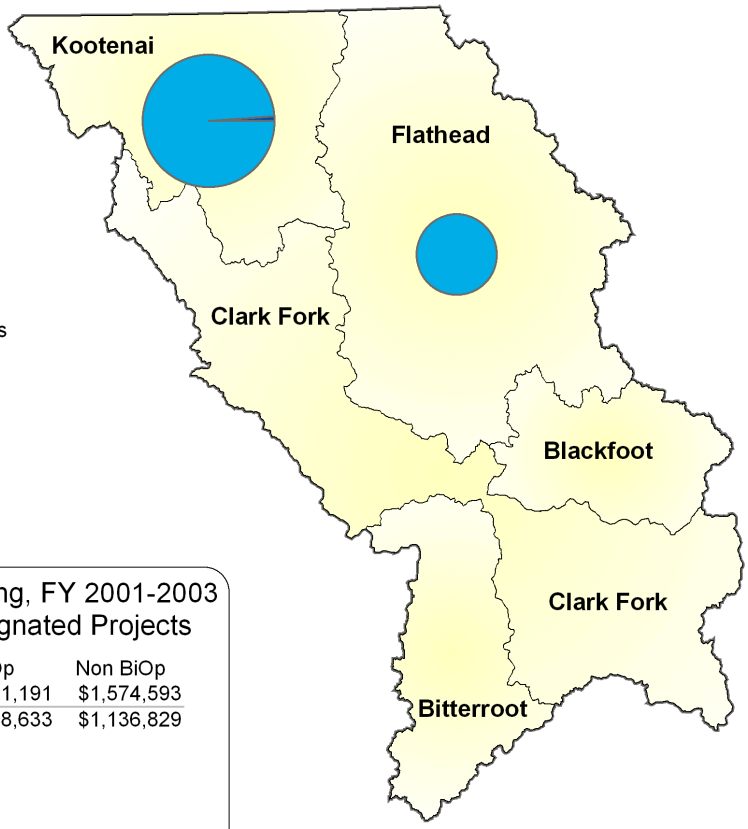
Columbia Basin Fish and Wildlife Authority

Mountain Columbia Province



BPA Spending, FY 2001-2003

FY 2001	$4,521,289
FY 2002	$5,316,853
FY 2003	$6,623,104
Total Spending	$16,461,246



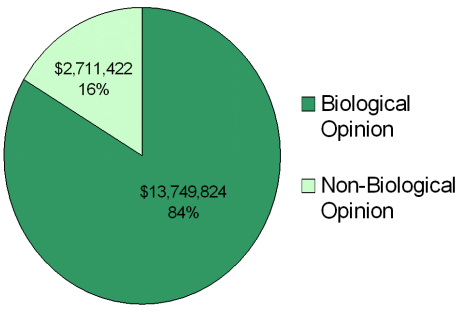
Legend

- Anadromous (1%)
- Resident (99%)
- Wildlife (0%)

Note: Diameter of pie represents relative funding levels in each subbasin.

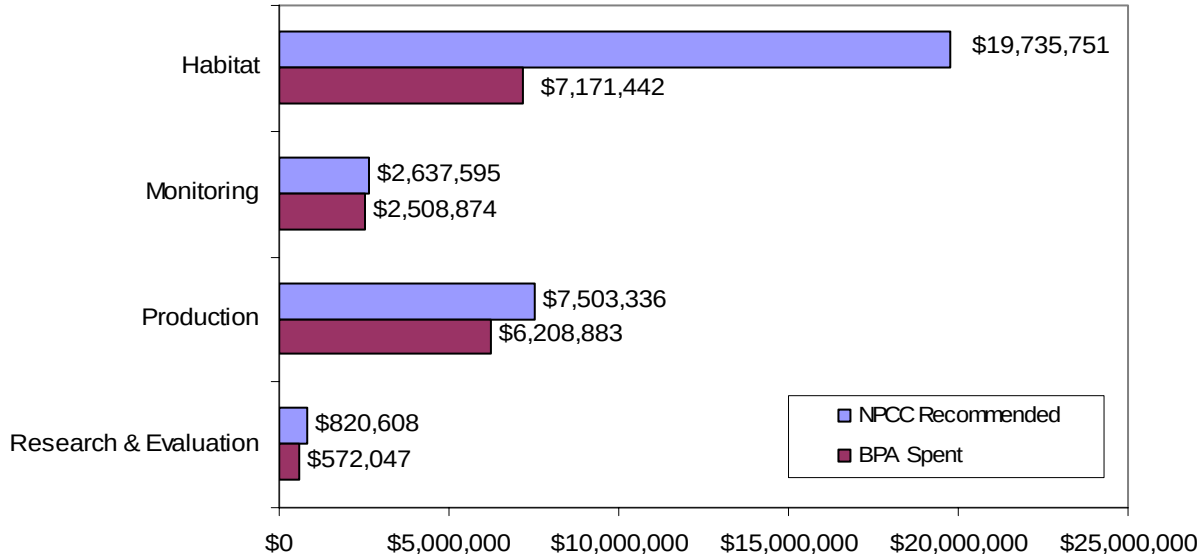
Biological Opinion Funding, FY 2001-2003
NMFS & USFWS Designated Projects

	BiOp	Non BiOp
Flathead	$2,881,191	$1,574,593
Kootenai	$10,868,633	$1,136,829

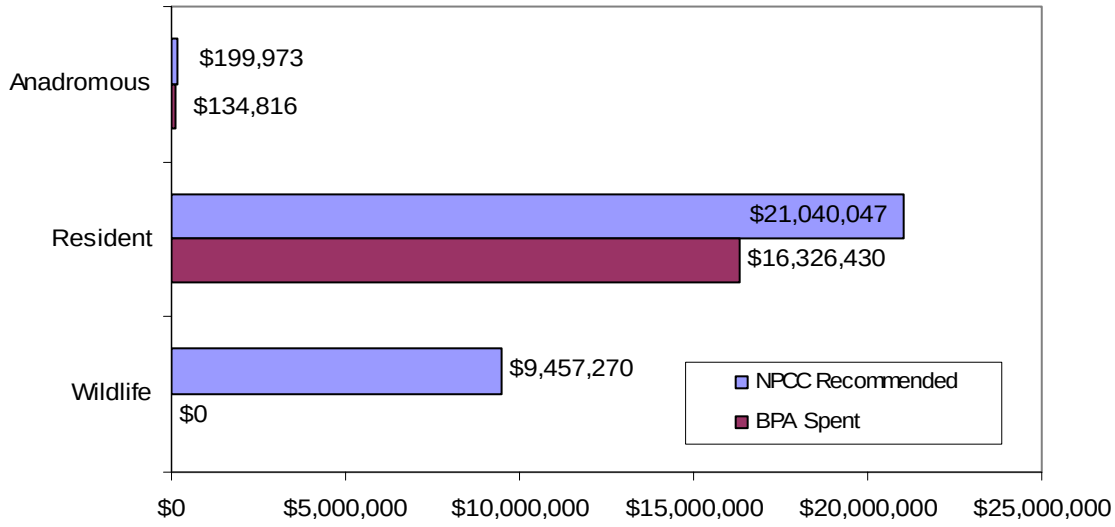


Mountain Columbia Province FY 2001-2003 Spending Summaries

NPCC Recommendations and BPA Spending by Project Category, FY01-03



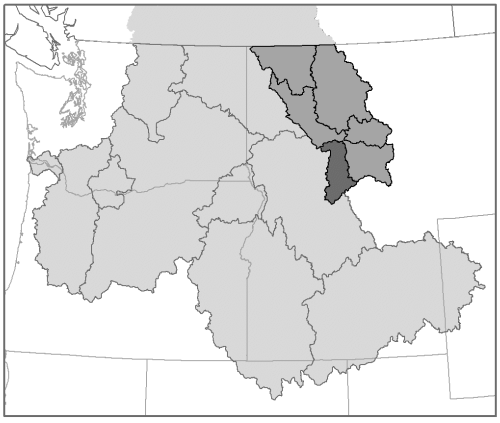
NPCC Recommendations and BPA Spending by Project Type, FY01-03

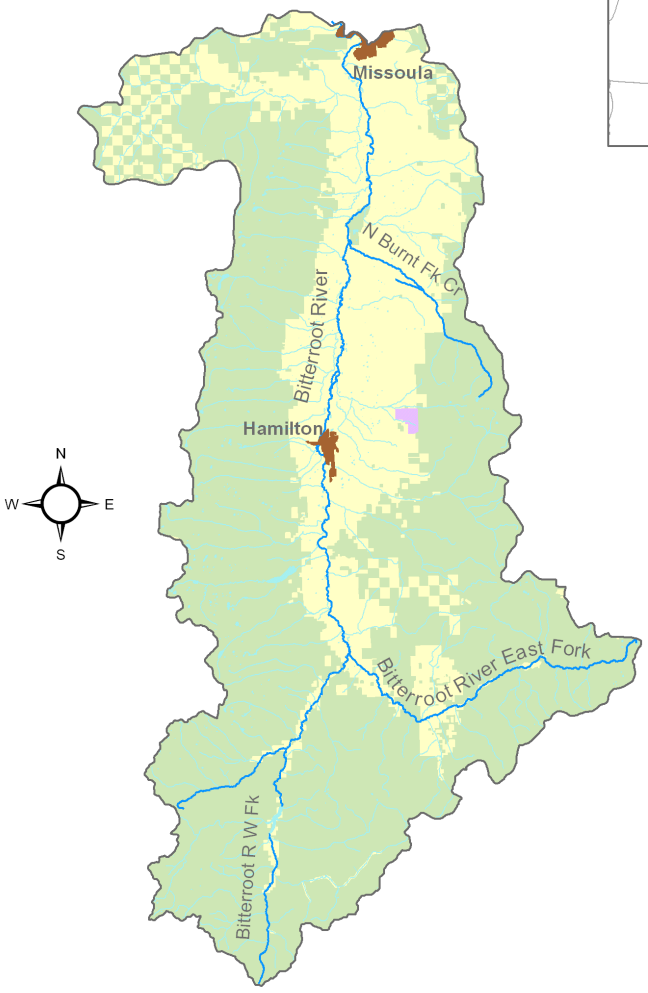


Bitterroot Subbasin

Columbia Basin Fish and Wildlife Authority

FY 2001-2003 NPCC Recommended and/or BPA Funded Fish & Wildlife Projects





Mountain Columbia Province

Bitterroot Subbasin

0 10 20 40 Miles

Data Layers: Land Ownership (ICBEMP), 100k Hydrography (Streamnet), Urban Areas (State Data), Projects (CBFWA)
Projection: UTM 1983, Zone 11
Produced by: Columbia Basin Fish & Wildlife Authority
Map Date: 5/20/04

LEGEND

Project Category
- Coordination
- Data Management
- Habitat
- Harvest
- Mainstem Survival
- Monitoring
- Production
- Research & Evaluation

Location Accuracy

Funded	Unfunded
Province	
Subbasin	
Stream	
Area	
Point	

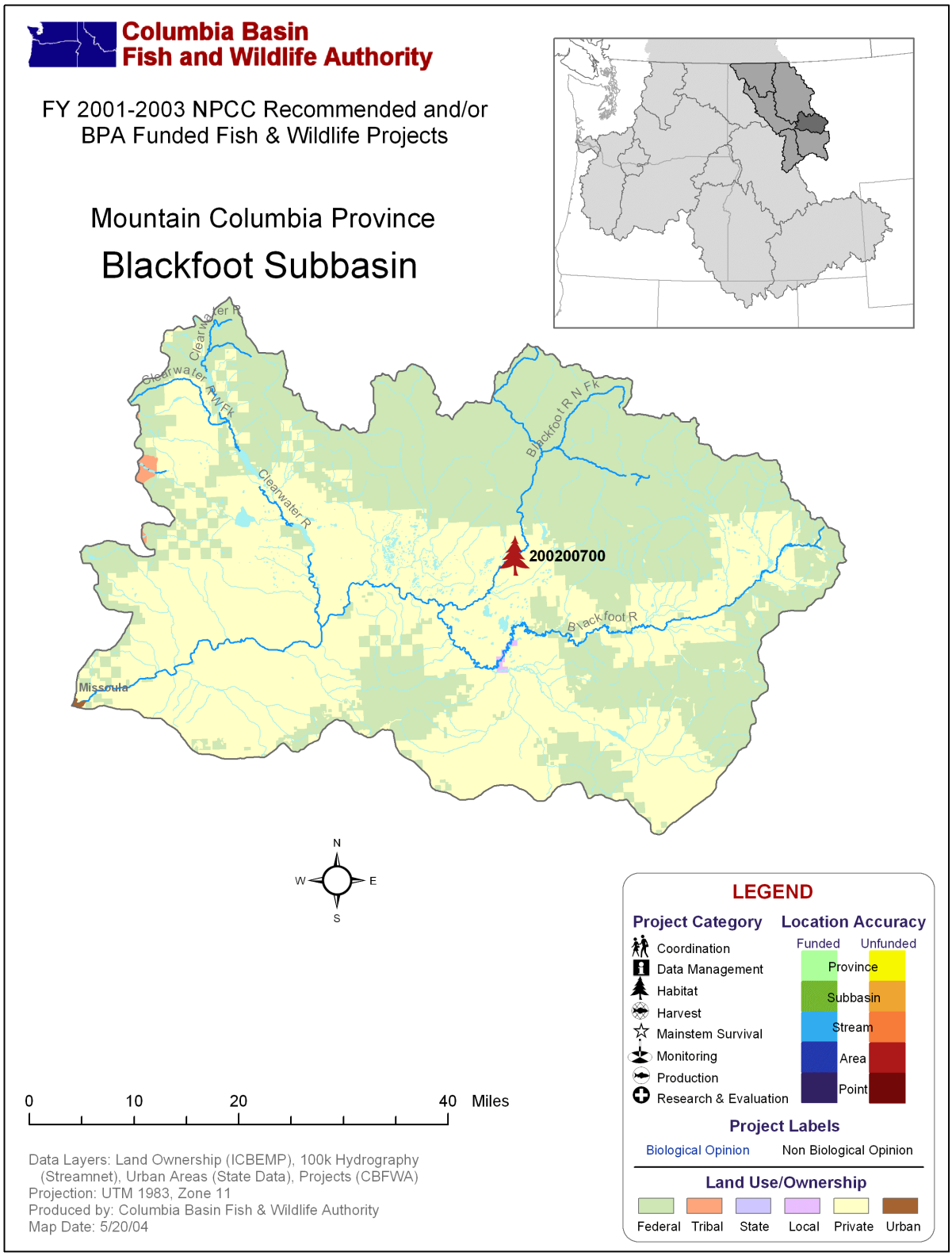
Project Labels

Biological Opinion | Non Biological Opinion

Land Use/Ownership

Federal | Tribal | State | Local | Private | Urban

Blackfoot Subbasin

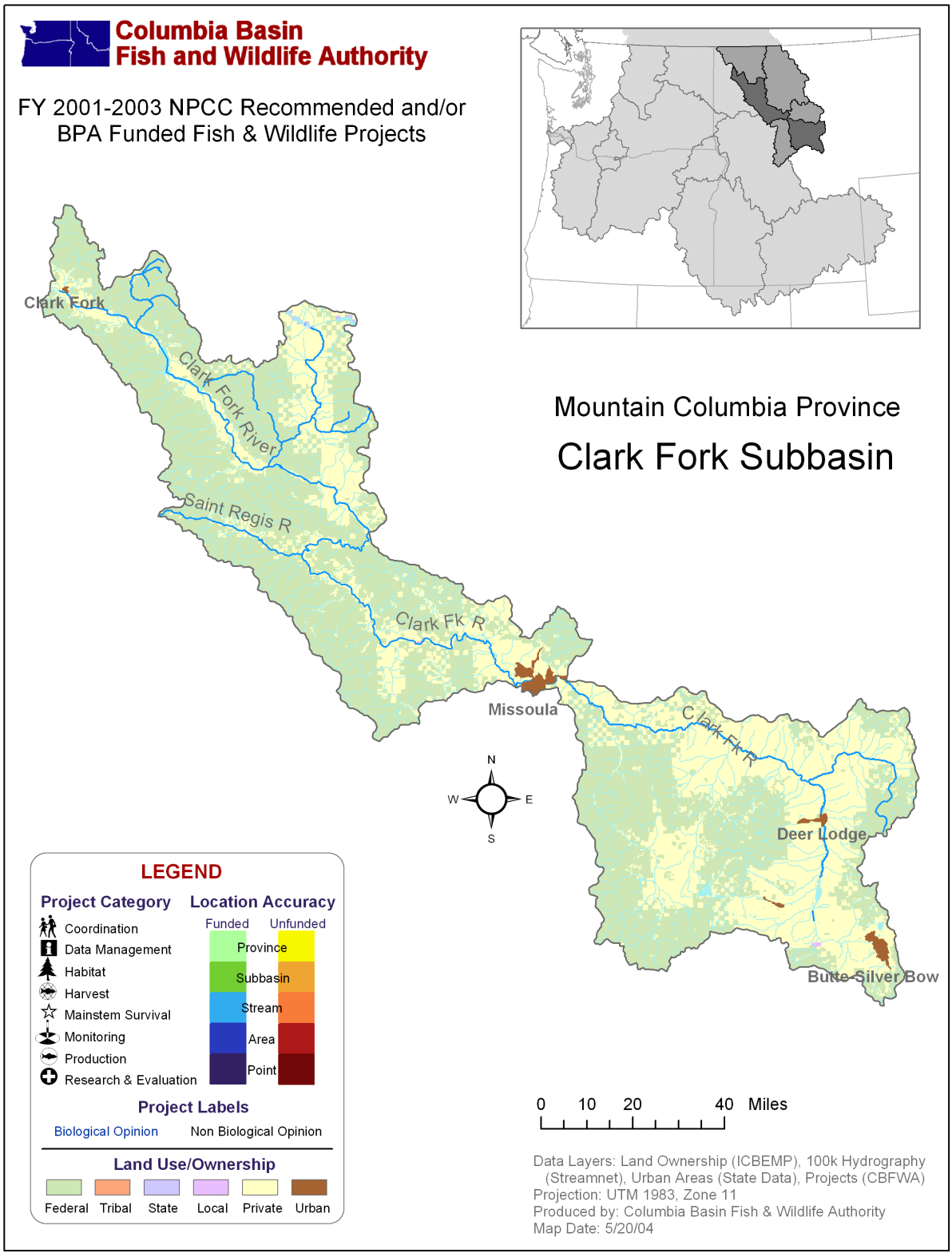


Projects in the Blackfoot Subbasin

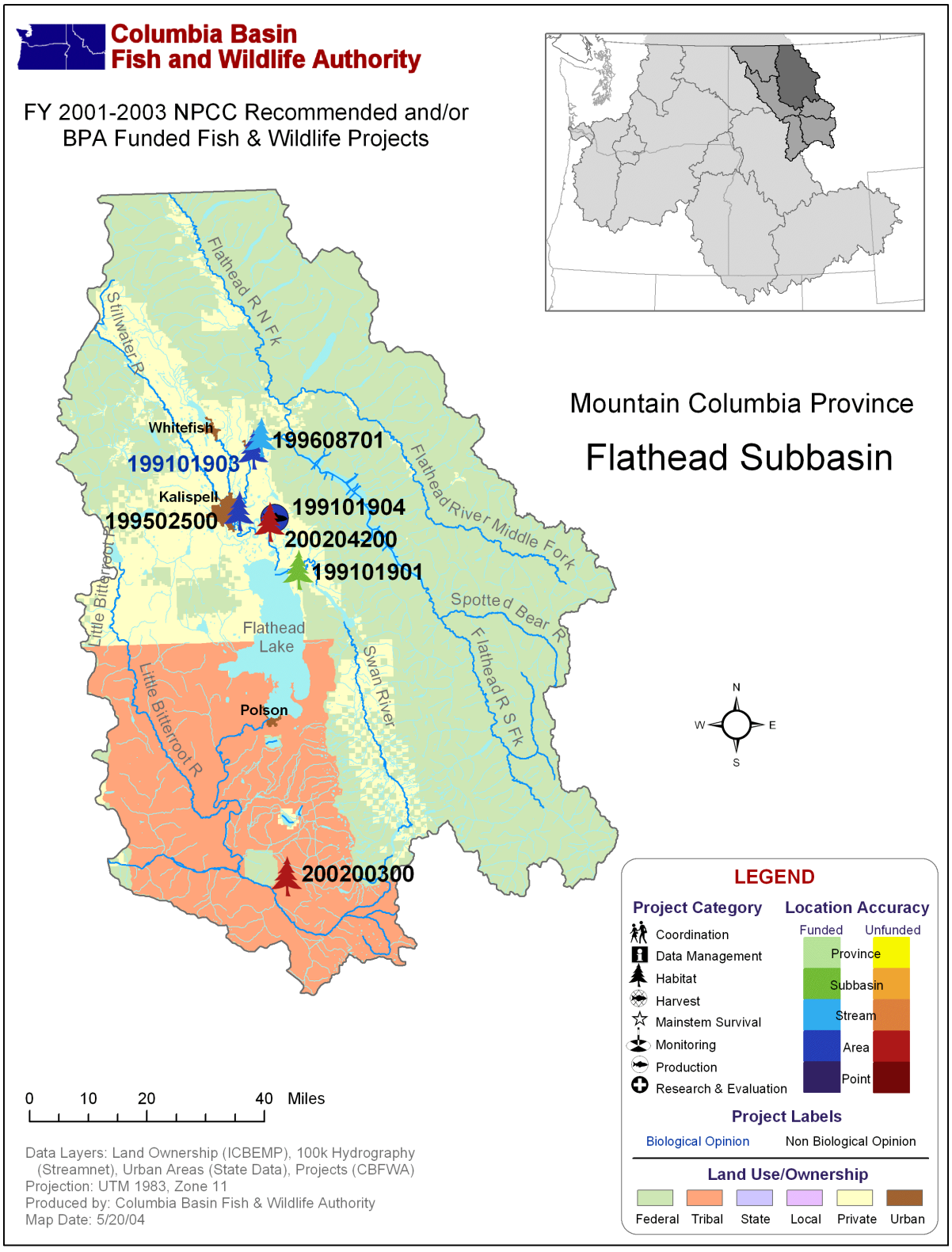
Project ID	*Project Title*	*Review Cycle*	*BiOp?*
200200700	Restoring Bull Trout Habitat in The Blackfoot River's North Fork	Mountain Columbia	no

Rec 00-03		$ 0	$330,000	$10,000	Type	Category	Accuracy
Spent 01-03	--	$ 0	$ 0	$ 0	Resident	Habitat	area

Clark Fork Subbasin



Flathead Subbasin



Projects in the Flathead Subbasin

Project ID	*Project Title*				*Review Cycle*		*BiOp?*
199101901	Research, Monitor, and Restore Native Species				Mountain Columbia		no
Rec 00-03		$166,048	$131,400	$144,500	Type	Category	Accuracy
Spent 01-03	--	$231,379	$109,910	$196,592	Resident	Habitat	subbasin
199101903	**Hungry Horse Mitigation**				**Mountain Columbia**		**yes**
Rec 00-03		$781,432	$982,850	$990,000	Type	Category	Accuracy
Spent 01-03	--	$910,298	$821,492	$1,149,401	Resident	Habitat	area
199101904	**Stocking of offsite waters for Hungry Horse Mitigation - Creston National Fish Hatchery**				**Mountain Columbia**		**no**
Rec 00-03		$160,000	$106,672	$109,872	Type	Category	Accuracy
Spent 01-03	--	$232,082	$268,024	$128,067	Resident	Production	area
199502500	Flathead River Instream Flow				FY 2000		no
Rec 00-03		$ 0	$ 0	$ 0	Type	Category	Accuracy
Spent 01-03	--	$58,843	$17,013	$138,037	Resident	Habitat	area
199608701	Focus Watershed Coordination-Flathead River Watershed				FY 2001		no
Rec 00-03		$65,303	$ 0	$ 0	Type	Category	Accuracy
Spent 01-03	--	$59,987	$32,261	$102,398	Resident	Habitat	stream
200200300	Secure and Restore Critical Fish and Wildlife Habitats				Mountain Columbia		no
Rec 00-03		$ 0	$4,918,444	$4,538,826	Type	Category	Accuracy
Spent 01-03	--	$ 0	$ 0	$ 0	Wildlife	Habitat	area
200204200	Riparian Habitat Preservation - Weaver Slough and McWinegar Slough				Mountain Columbia		no
Rec 00-03		$ 0	$1,002,000	$ 0	Type	Category	Accuracy
Spent 01-03	--	$ 0	$ 0	$ 0	Resident	Habitat	area

Projects in **bold** have preliminary results data included in this report.

199101904 – *Stocking of Offsite Waters for Hungry Horse Mitigation*

2002 Project Objectives

- Rear up to 100,000 westslope cutthroat trout annually for offsite mitigation stocking
- Rear up to 100,000 rainbow trout annually for offsite mitigation in closed-basin waters

Fish Stockings - Preliminary Results

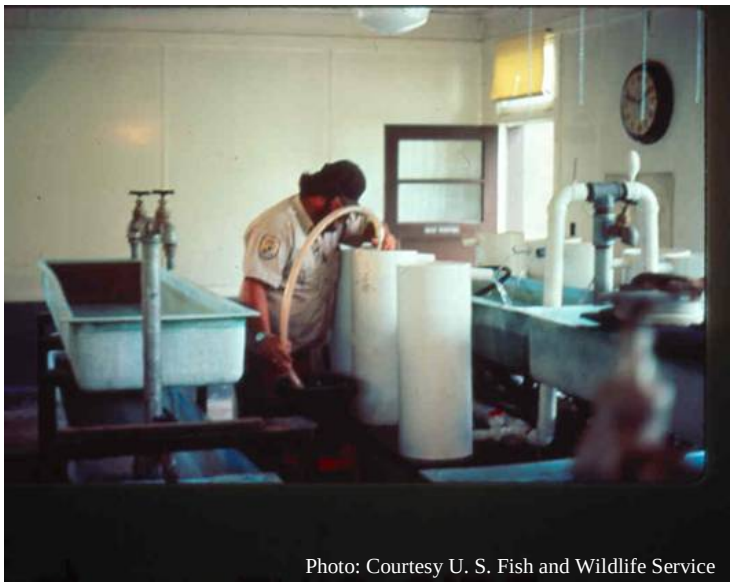
Westslope Cutthroat Trout

CSKT Managed Waters

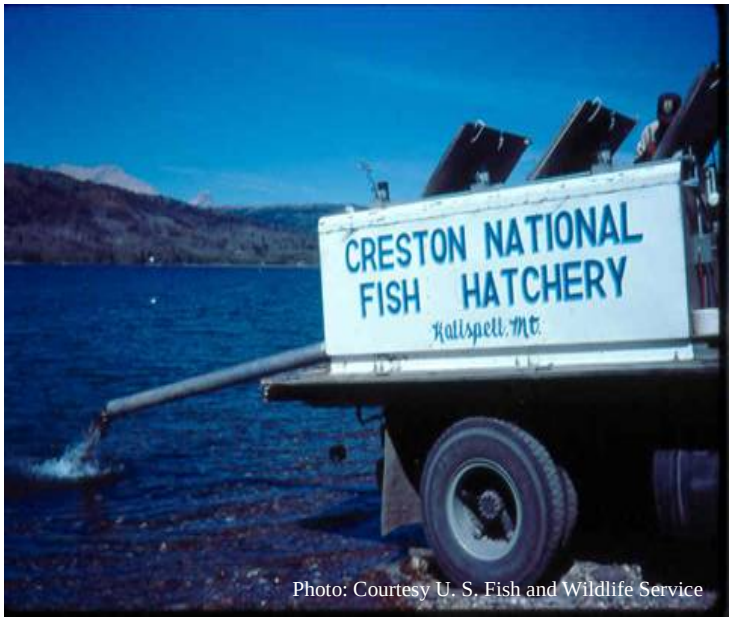
- Upper Jocko Reservoir	3,000
- Lower Jocko Reservoir	7,000
- Swartz Lake	5,000
- Turtle Lake	3,000
- Lower Twin Lake	2,000
- Upper Twin Lake	2,000

MFWP Managed Waters

- Bailey Lake	2,000
- Dollar Lake	1,000
- Hidden Lakes	2,500
- Whitefish Lake	25,000
- Upper Whitefish Lake	10,000
- Lion Lake	3,000
- Bootjack Lake	1,000
- Myron Lake	750



U.S. Fish and Wildlife Service employee culturing westslope cutthroat trout and rainbow trout at the Creston National Fish Hatchery.



Release of hatchery-reared rainbow trout and westslope cutthroat trout in closed-basin lakes in the Flathead Subbasin.

Rainbow Trout

CSKT Managed Waters

- Pablo Reservoir	25,000
- McDonald Ponds	5,000

MFWP Managed Waters

-McGregor Lake	75,000

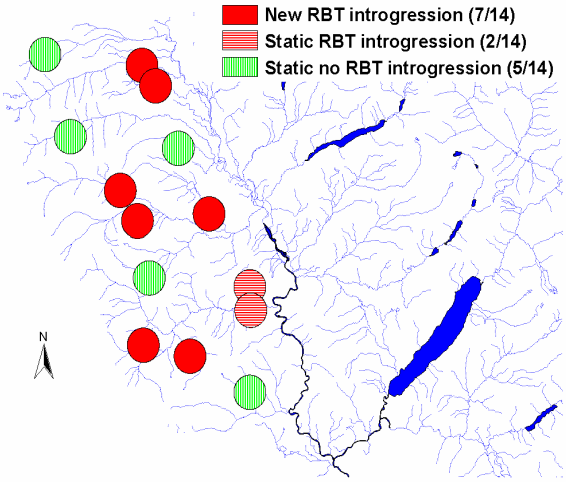
199101903—*Hungry Horse Mitigation*

2002 Project Objectives

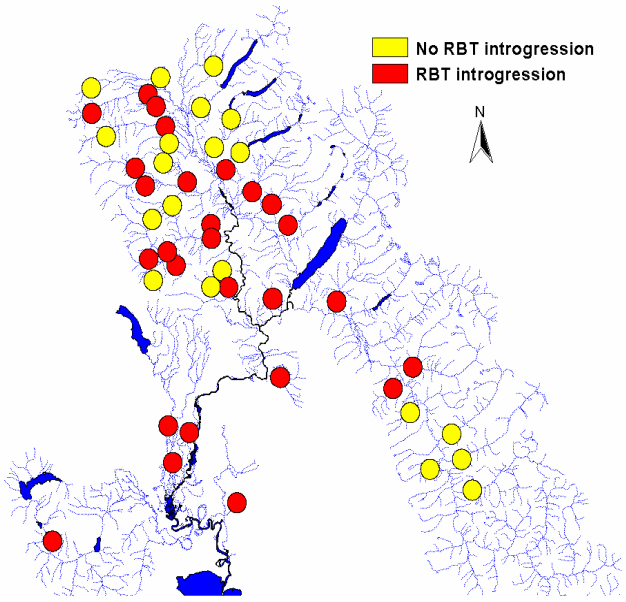
- Assess distribution and movements of juvenile and adult bull trout, westslope cutthroat trout, rainbow trout, and westslope cutthroat x rainbow trout hybrids in the mainstem, North, and Middle forks of the Flathead River
- Eliminate or suppress hybridized or non-native populations to reduce negative species interactions with native westslope cutthroat trout and bull trout
- Improve fish habitat and passage problems in streams throughout the Flathead Basin
- Develop habitat suitability curves for bull trout and westslope cutthroat trout required by the Instream Flow Incremental Methodology on the Flathead River

Distribution of Westslope Cutthroat Trout and Hybrids - Preliminary Results

- Hybridization between westslope cutthroat trout and rainbow trout was confirmed in 26 of 47 sample locations
- Surveys illustrated occurrence of hybridization between westslope cutthroat trout and rainbow trout in tributaries of the North Fork Flathead River previously void of such events



Status of hybridization between rainbow trout and westslope cutthroat trout in the North Fork Flathead River.



Locations in the Flathead River basin where hybridization occurs between westslope cutthroat trout and rainbow trout..

Example of a westslope cutthroat trout x rainbow trout hybrid.

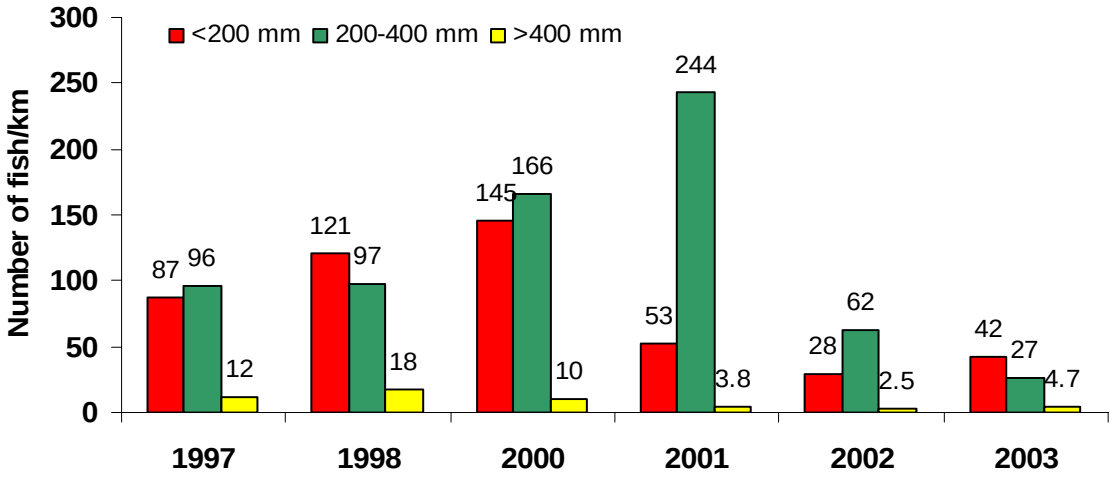
Activities to Suppress Non-native Fishes - Preliminary Results

Lower Basin Tributaries
- Barriers
- Fish and redd removal

Upper Basin Lakes/Tributaries
- Chemical eradication
- Barriers

Methods used to control non-native fishes in the Fathead Subbasin include redd removal and barriers.

- Eradication/control efforts initiated in 1999
- Control efforts have resulted in a reduction of rainbow trout and rainbow trout x westslope cut-throat trout hybrids from an average of 88 fish/km of stream (1997-2000) to 28 fish/km (2002-2003) in the Flathead River

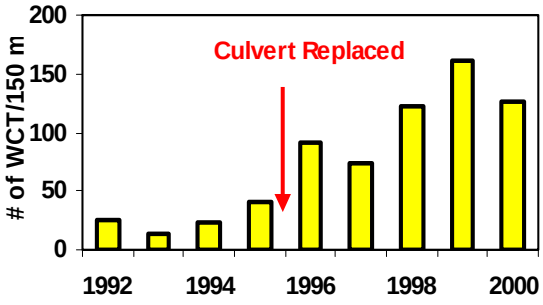


Reductions in the numbers of rainbow trout and westslope cutthroat trout x rainbow hybrids per km of stream as a result of control/ eradication efforts implemented in 1999.

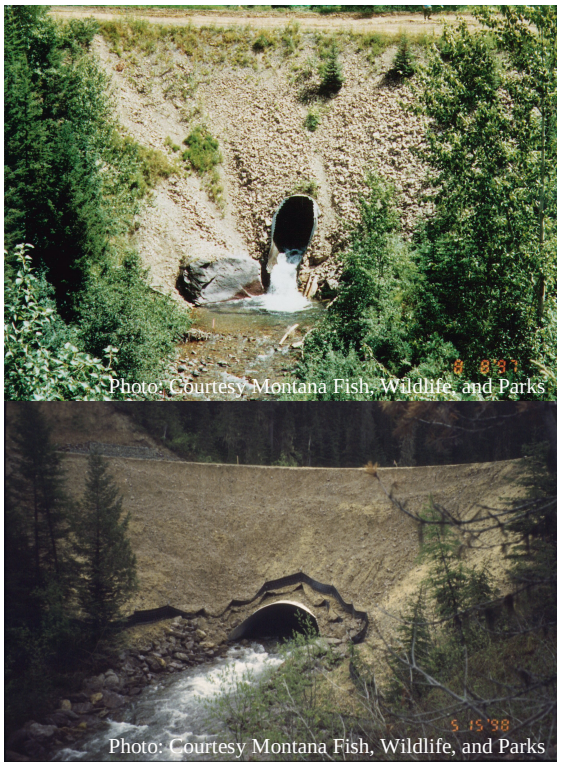
Fish Passage Improvements and Population Responses - Preliminary Results

Fish Passage

- Seven fish passage enhancement projects completed from 1994-1997
- Redds now identified above all previous barriers
- Projects resulted in the availability of 16% more habitat

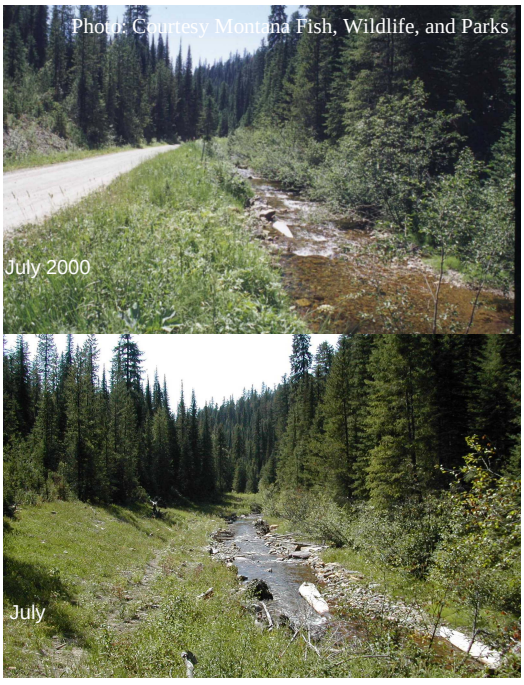


Westslope cutthroat trout population estimates for Murray Creek following the replacement of faulty culverts.



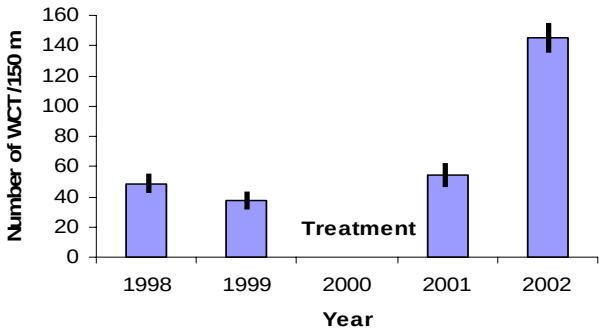
Prior to replacement (upper photo), the Felix Creek culvert prevented fish from moving upstream.

Fish Habitat Improvements and Population Responses - Preliminary Results



Emery Creek before (upper) and after flood restoration..

- Restored floodplain
- Stabalized channel
- Installed 50 habitat unit structures
- Juvenile westslope cutthroat trout density doubled



Juvenile westslope cutthroat trout densities before and after restoration of Emery Creek.

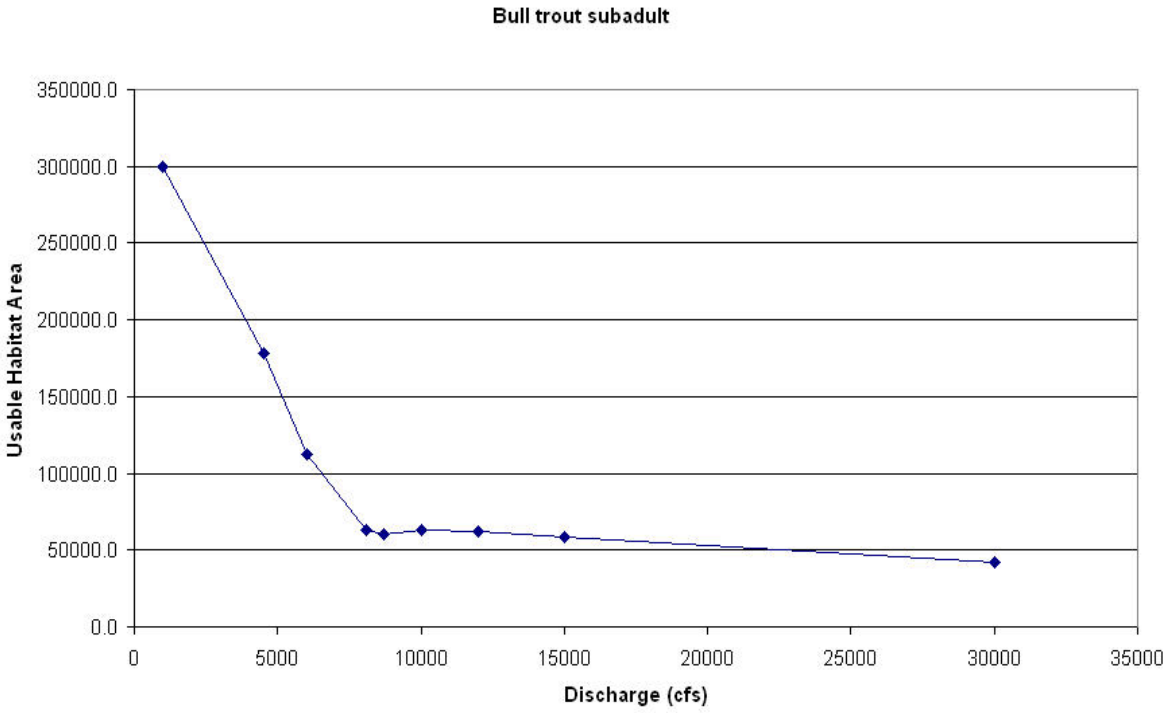
Habitat Availability Related to Discharge - Preliminary Results

Photo: Courtesy Montana Fish, Wildlife, Parks

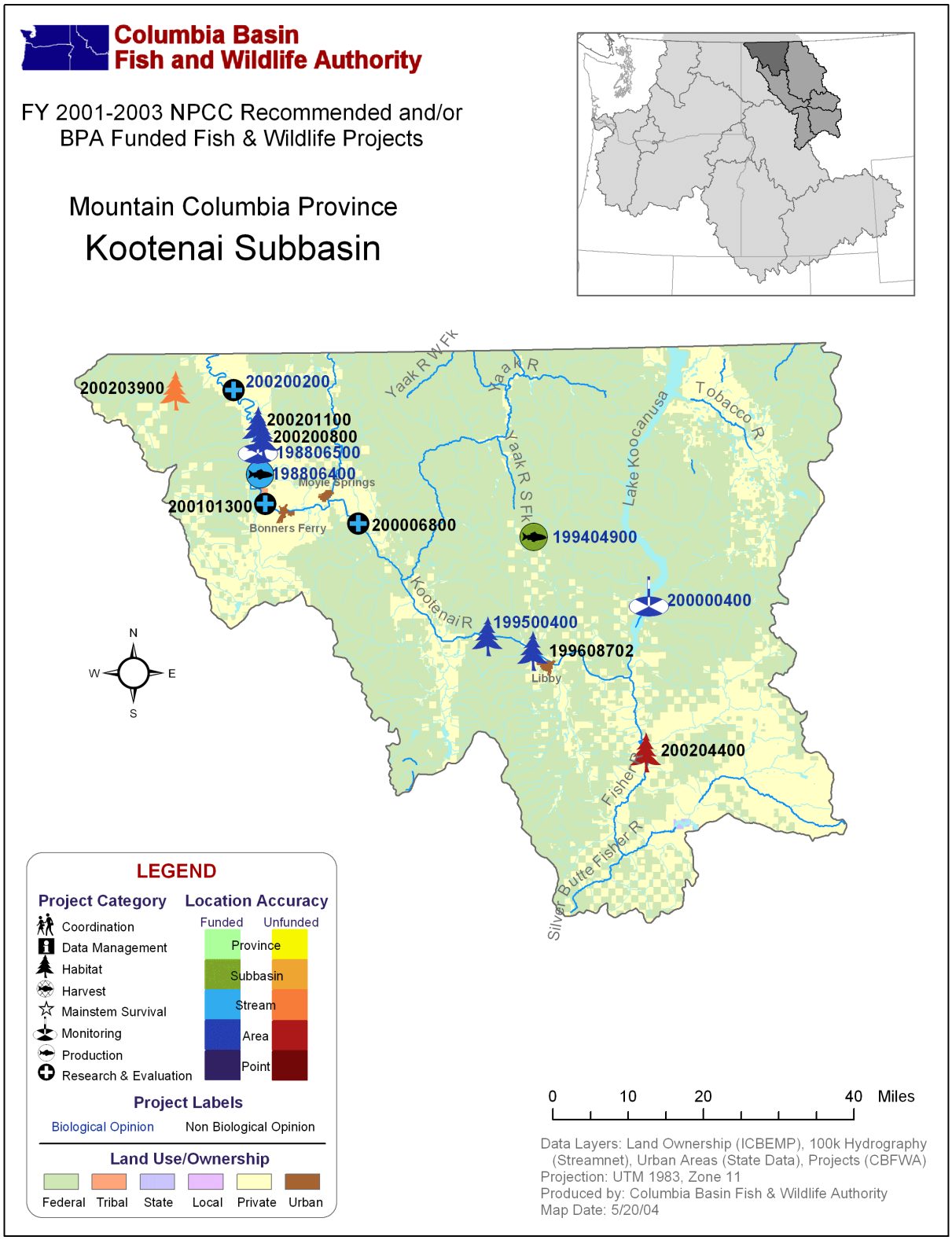
Montana Fish, Wildlife, and Parks studies have shown that water releases from Hungry Horse Reservoir limit available habitat for subadult bull trout.

- Useable habitat area for subadult bull trout in the Flathead River below Hungry Horse Reservoir is significantly reduced as discharge (cfs) occurs
- A significant loss of habitat area occurs with a discharge of only 5000 cfs

Useable Habitat Area for Flathead River Subadult Bull Trout Under Different Discharges



Kootenai Subbasin



Projects in the Kootenai Subbasin

Project ID	*Project Title*	*Review Cycle*	*BiOp?*
198806400	**Kootenai River White Sturgeon Studies and Conservation Aquaculture**	**Mountain Columbia**	**yes**

Rec 00-03		$1,128,568	$1,160,000	$2,999,000	Type	Category	Accuracy
Spent 01-03	--	$1,247,674	$1,651,384	$1,228,444	Resident	Production	stream

198806500	Kootenai River Fisheries Recovery Investigations	Mountain Columbia	yes

Rec 00-03		$570,000	$825,391	$1,057,804	Type	Category	Accuracy
Spent 01-03	--	$701,039	$717,181	$863,592	Resident	Monitoring	area

199404900	Improving the Kootenai River Ecosystem	Mountain Columbia	yes

Rec 00-03		$273,333	$710,891	$855,000	Type	Category	Accuracy
Spent 01-03	--	$271,655	$471,285	$710,268	Resident	Production	subbasin

199500400	**Mitigation for the Construction and Operation of Libby Dam**	**Mountain Columbia**	**yes**

Rec 00-03		$795,000	$805,000	$830,000	Type	Category	Accuracy
Spent 01-03	--	$611,681	$928,768	$966,672	Resident	Habitat	area

199608702	Focus Watershed Coordination in the Kootenai River Watershed	Mountain Columbia	no

Rec 00-03		$100,000	$101,500	$101,750	Type	Category	Accuracy
Spent 01-03	--	$14,453	$97,952	$104,486	Resident	Habitat	area

200000400	Monitor and Protect Bull Trout for Koocanusa Reservoir	Mountain Columbia	yes

Rec 00-03		$60,400	$62,000	$62,000	Type	Category	Accuracy
Spent 01-03	--	$47,382	$56,178	$123,502	Resident	Monitoring	area

200006800	Impact of Flow Regulation on Riparian Cottonwood Ecosystems	FY 2000	no

Rec 00-03	$199,973	$ 0	$ 0	$ 0	Type	Category	Accuracy
Spent 01-03	--	$134,816	$ 0	$ 0	Anadromous	Research & Evaluation	stream

200101300	Evaluate the Effects of Nutrient Supplementation on Benthic Periphyton, Macroinvertebrates, and Juvenile Sturgeon in the Kootenai River	FY01 Innovative	no

Rec 00-03		$170,635	$ 0	$ 0	Type	Category	Accuracy
Spent 01-03	--	$ 0	$69,491	$95,812	Resident	Research & Evaluation	stream

200200200	Assess Feasibility of Enhancing White Sturgeon Spawning Sub-strate Habitat, Kootenai R., Idaho	Mountain Columbia	yes

Rec 00-03		$ 0	$350,000	$100,000	Type	Category	Accuracy
Spent 01-03	--	$ 0	$ 0	$271,928	Resident	Research & Evaluation	stream

Projects in **bold** have preliminary results data included in this report.

Projects in the Kootenai Subbasin, continued...

Project ID	*Project Title*					*Review Cycle*		*BiOp?*
200200800	Reconnection of Floodplain Slough Habitat to the Kootenai River					Mountain Columbia		no
Rec 00-03			$ 0	$139,974	$540,000	Type	Category	Accuracy
Spent 01-03		--	$ 0	$ 0	$98,956	Resident	Habitat	area
200201100	Implement Floodplain Operational Loss Assessment, Protection, Mitigation and Rehabilitation on the Lower Kootenai River Watershed Ecosystem					Mountain Columbia		no
Rec 00-03			$ 0	$293,864	$612,500	Type	Category	Accuracy
Spent 01-03		--	$ 0	$75,914	$444,949	Resident	Habitat	area
200203900	Smith Creek Restoration					Mountain Columbia		no
Rec 00-03			$ 0	$52,680	$302,680	Type	Category	Accuracy
Spent 01-03		--	$ 0	$ 0	$ 0	Resident	Habitat	stream
200204400	Purchase Conservation Easement from Plum Creek Timber Company (PCT) along Fisher River					Mountain Columbia		no
Rec 00-03			$ 0	$500,000	$500,000	Type	Category	Accuracy
Spent 01-03		--	$ 0	$ 0	$ 0	Resident	Habitat	area

199500400—*Mitigation for the Construction and Operation of Libby Dam—Libby Mitigation*

2002 Project Objectives

- Complete habitat restoration projects in Grave, Libby, Upper Libby creeks to enhance native species in the Kootenai Subbasin
- Develop a genetic conservation reserve of native interior redband trout to be used as the initial source of eggs for reintroduction following eradication efforts in local lakes

Habitat Restoration Projects—Preliminary Results

Graves Creek Irrigation Diversion

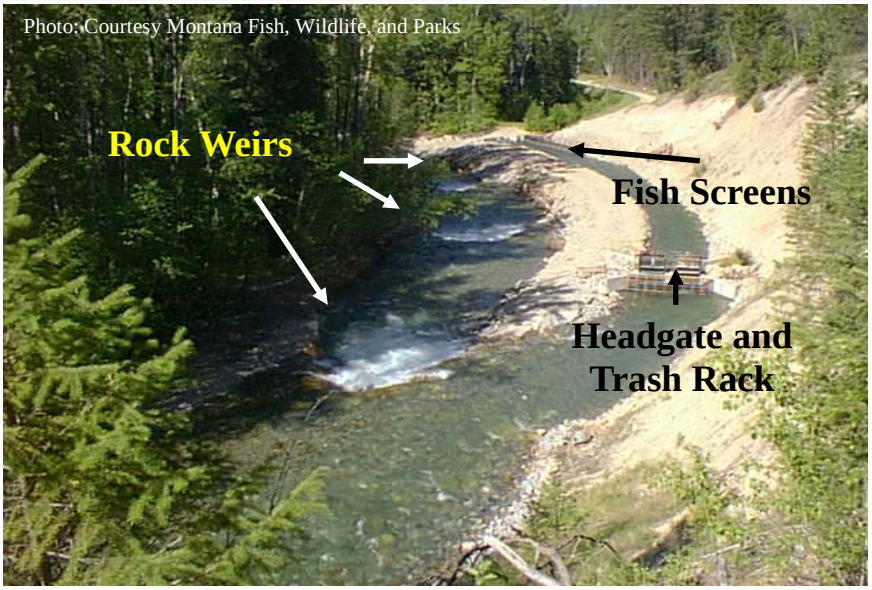
Photo: Courtesy Montana Fish, Wildlife, and Parks


Photo: Courtesy Montana Fish, Wildlife, and Parks


Photo: Courtesy Montana Fish, Wildlife, and Parks.

Prior to improvements, the Graves Creek diversion which was created in 1923, produced 2,000 cubic yards of sediment annually.

Habitat Restoration Projects—Preliminary Results Continued



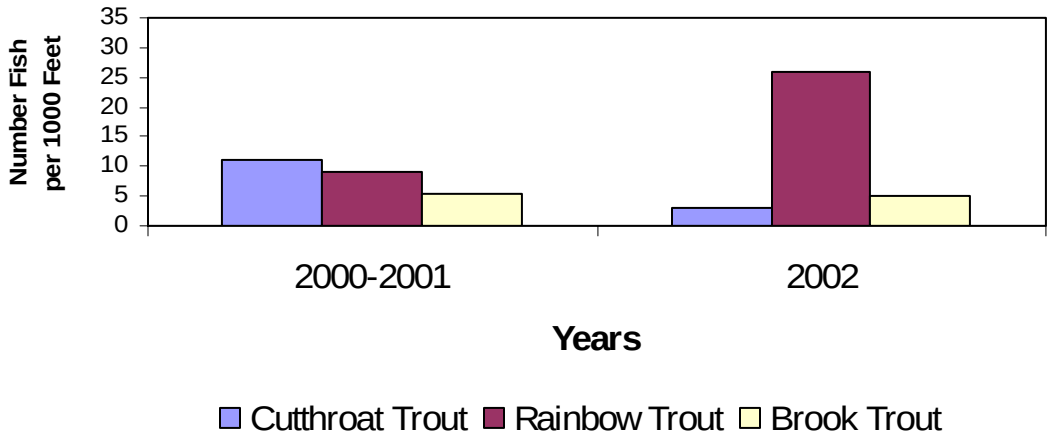
To improve fish habitat, and associated populations, weirs, screens and headgates were installed in Graves Creek.

Physical Monitoring - Graves Creek

Parameter	Pre-Project	Post-Project
Bankfull Width (ft)	45-240	50-54
Width/Depth Ratio	93.5	10
Sinuosity	1.15	1.4
Bankfull Depth (ft)	1.2	2.3
Pool Spacing (ft)	670	430

Channel Morphology Changes
Increases—Maximum and mean depth
Reductions— Cross section area, bank-ful width, and width/depth ratio

Fisheries Habitat Improvements
Pool length—17% increase
Mean pool depth—37% increase
Maximum pool depth—54% increase



Habitat Restoration Projects—Preliminary Results Continued

Libby Creek (River Mile 12) – Results

Prior to restoration, 5,900 yards of sediment was released annually from the incised bank (right side of photo).

Restoration Efforts

The following structures were installed to assist in moving the creek away from the sloughing bank:

- Rock J-hook vanes (N = 7)
- Log/rootwad complexes (N = 7)
- More than 3,000 trees

Corrective measures have moved the creek and streambank incision has been eliminated.

Aerial view shows the creek no longer flows directly into the bank (area circled).

Physical Monitoring - Graves Creek

Parameter	Pre-Project	Post-Project
Bankfull Width (ft)	45-240	50-54
Width/Depth Ratio	93.5	10
Sinuosity	1.15	1.4
Bankfull Depth (ft)	1.2	2.3
Pool Spacing (ft)	670	430

Habitat Restoration Projects—Preliminary Results Continued

Libby Creek (River Mile 22) – Results

Upper Libby Creek in 2002 prior to restoration efforts.

Upper Libby Creek during restoration.

Upper Libby Creek following restoration efforts

Restoration Efforts

Restoration efforts included the use of the following structures and vegetation:

- Cobble-grade control structures (N = 11)
- Rootwad/logjam complexes (N = 19)
- Shrub transplants (N = 500)
- Willow plantings (N = 2,000)
- Cottonwood plantings (N = 75)
- Containerized native shrubs (N = 1,600)

Parameter	Pre-Project	Post-Project
Total Length	2,700 ft. Braided	3,200 ft.
Bankfull Width	27-63 ft.	28-35 ft.
Mean Depth	1.2 ft.	2.1 ft.
Max. Depth	2.2 ft.	3.0 ft.
Width/Depth ratio	15-35	20-23
Sinuosity	1.1	1.6
Pool Spacing	247 ft.	80 ft.

Lake Rehabilitation Projects and Genetic Conservation

Banana Lake receiving chemical treatments to suppress non-native fish species.

Suppression efforts directed towards non-native fishes were completed at the following closed-basin lakes in the Flathead River subbasin:

- Bootjack Lake
- Cibid Lake
- Topless Lake
- Carpenter Lake
- Banana Lake
- Spring Creek

In an attempt to preserve the unique genetic stocks of redband trout that exist in the lakes of the Flathead subbasin, specimens were collected from the lakes prior to rehabilitation.

The use of artificial production and the rearing of offspring in natural conditions are techniques that are being used to enable biologists to restock the treated lakes with an ample number of fish that are fit for their new environments, an approach that will maximize survival following stocking.

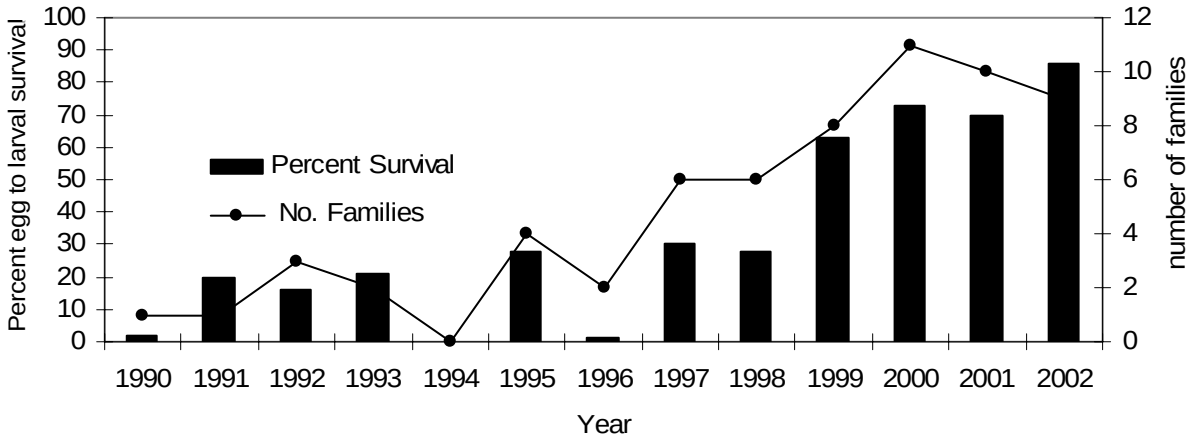
198806400 — *Kootenai River White Sturgeon Studies and Conservation*

2002 Project Objectives

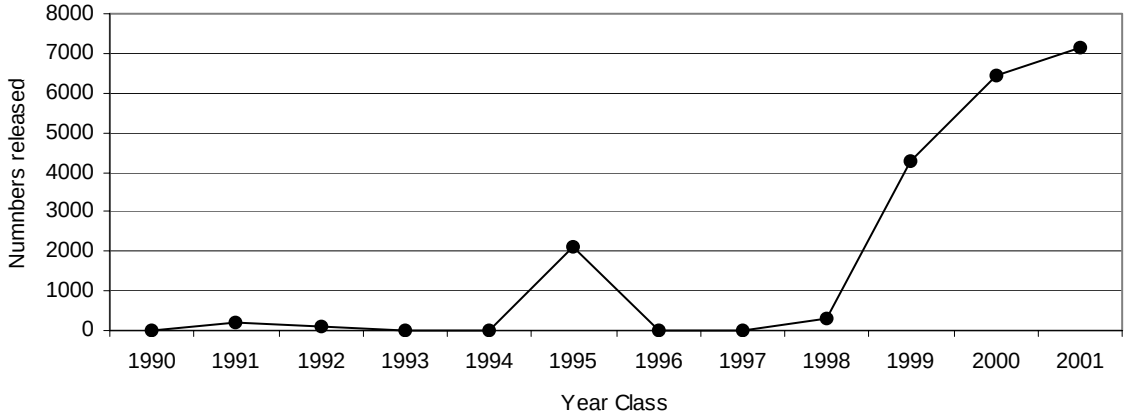
- Propagate and rear up to 12 families of white sturgeon per year from wild Kootenai River broodfish
- Monitor and evaluate genetic variability and diversity of wild white sturgeon broodstock and their hatchery- produced progeny
- Monitor and evaluate survival, growth, and condition of hatchery-reared juvenile white sturgeon

Artificial Production of Kootenai River White Sturgeon - Preliminary Results

- Spawned 112 Kootenai River white sturgeon (36 females and 76 males) from 1990-2002
- 76 families produced from 1990-2002
- Released over 20,000 juvenile white sturgeon from 1992-2002
- Annual number of families ranged from 1—11 from 1990—2002
- Egg to larval survival of 1.8—86% from 1990-2002

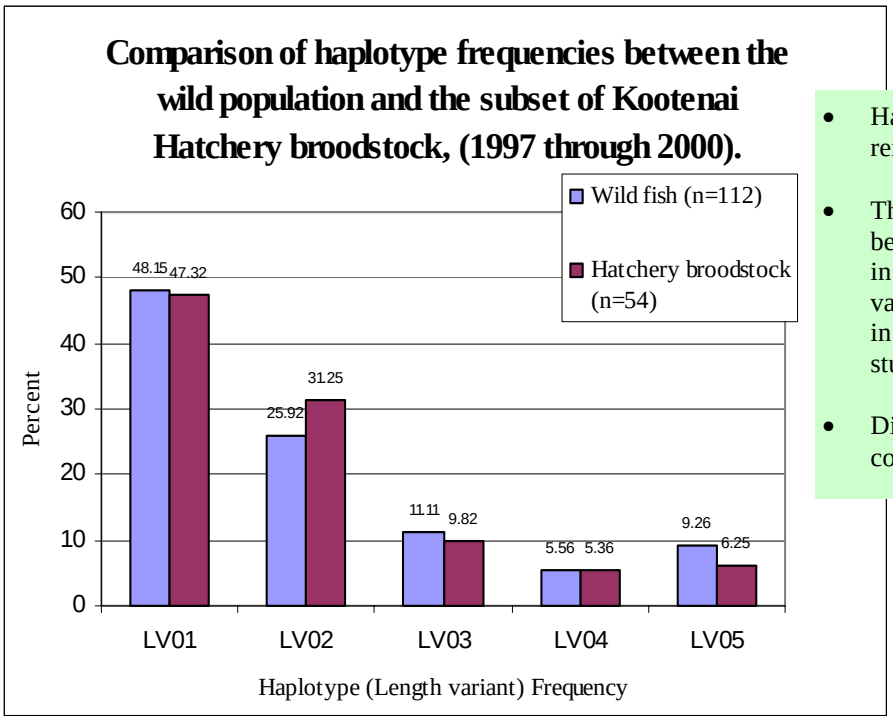


Percent egg to larval survival for Kootenai River white sturgeon reared at the Kootenai Hatchery



Annual releases of Kootenai River white sturgeon reared at the Kootenai Hatchery

Genetic Variability and Diversity of Broodstock and Progeny - Preliminary Results



- Haplotype frequencies have remained relatively constant
- The breeding program has been successful in maintaining, in the hatchery broodstock, the variability and diversity found in wild Kootenai River white sturgeon
- Diversity has remained constant with no variants lost

Survival, Growth, Condition, and Habitat Use - Preliminary Results

- 60% (± 10%) survival of released fish after one year
- 90% (± 10%) survival from year two and later
- Average growth 2.5 in/year
- Following adaptation to the wild, hatchery reared white sturgeon exhibit excellent survival, significant improvements in growth and improved condition factors

Juvenile Kootenai River white sturgeon reared at the Kootenai Hatchery.

This page intentionally left blank.