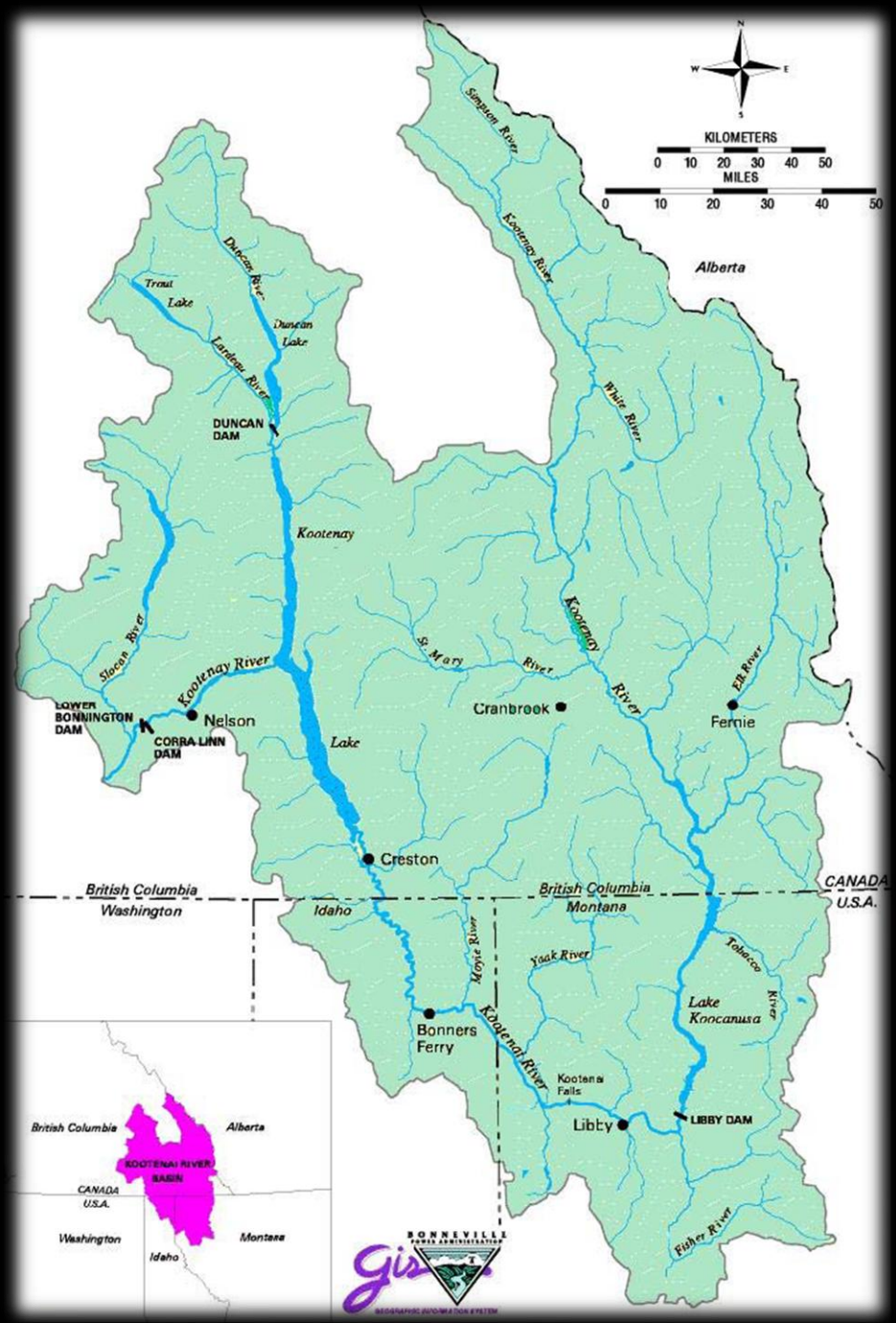
Kootenai River Native Fish Conservation Aquaculture Master Plan

Prepared by Kootenai Tribe of Idaho

Funded by Bonneville Power Administration through Northwest Power and Conservation Council's Fish and Wildlife Program

Kootenai River Subbasin

- 9 million acres
- 2 Countries
- 2 States, 1 Province
- Multiple jurisdictions
- Multiple endangered species



The present

Kootenai River white Sturgeon
ENDANGERED

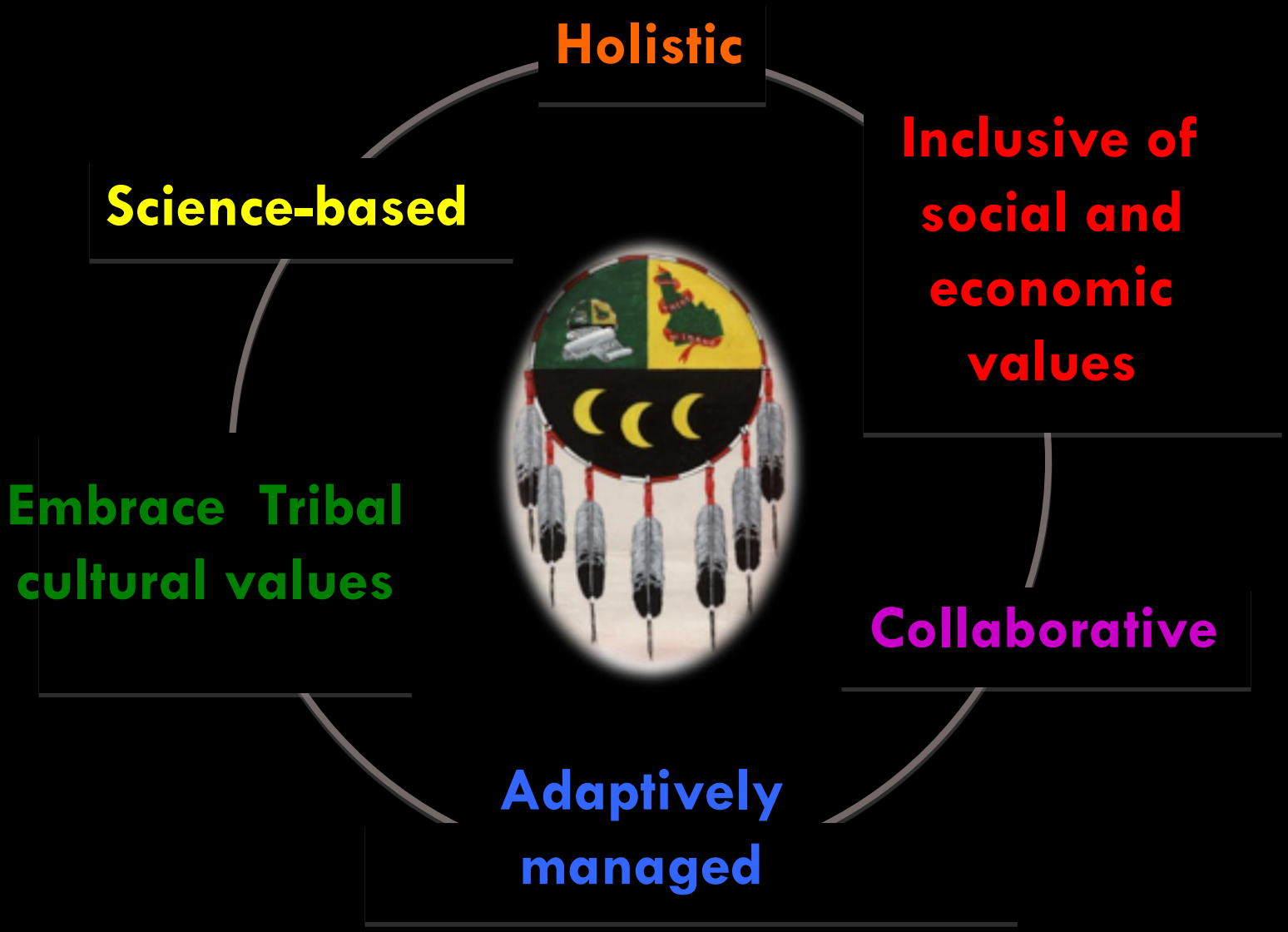
Burbot
PETITIONED

Bull trout
THREATENED

West Slope Cutthroat
PETITIONED

South Arm Kokanee
FUNCTIONALLY EXTINCT

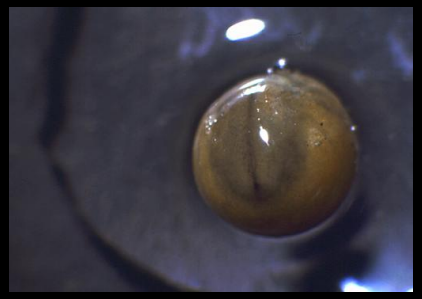
The approach: the Tribe's view



Kootenai River white sturgeon

Response to development has been failure to complete life cycle

- egg suffocation/incomplete incubation
- predation
- larval food limitation/starvation
- over-wintering energy deficiency

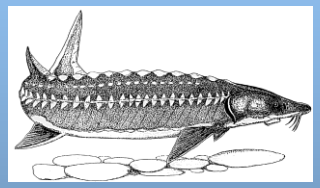


Result:

Aging population and virtual lack of recruitment for over five decades

Conservation aquaculture

1988



1996

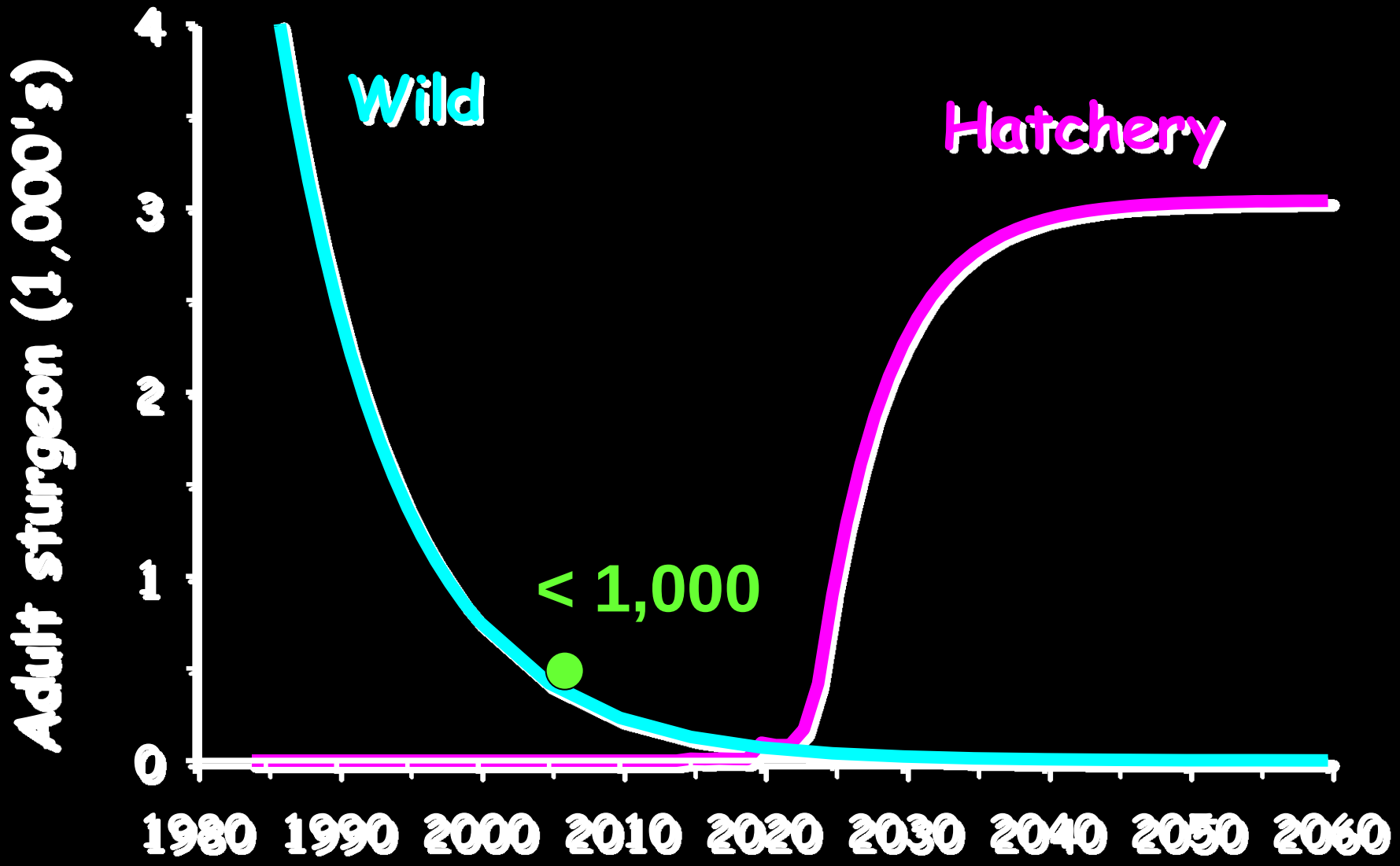
- 1988: Tribe proposes sturgeon studies and experimental aquaculture program
- 1989: Experimental aquaculture facility construction begins
- 1990: First Kootenai sturgeon spawned
- 1991: First successful production
- 1992: First hatchery release into the wild
- 1993: Breeding plan developed
- 1994: Kootenai sturgeon ESA listed
- 1996: USFWS Recovery Plan – conservation aquaculture listed as a priority action

Conservation aquaculture

Sturgeon goals:

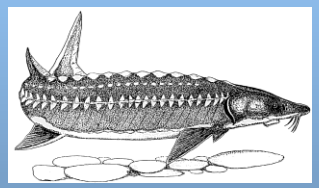
- Prevent extinction
- Restore healthy age class structure
- Enhance demographic and genetic viability for persistence of the population

Kootenai River white sturgeon



Conservation aquaculture

2010



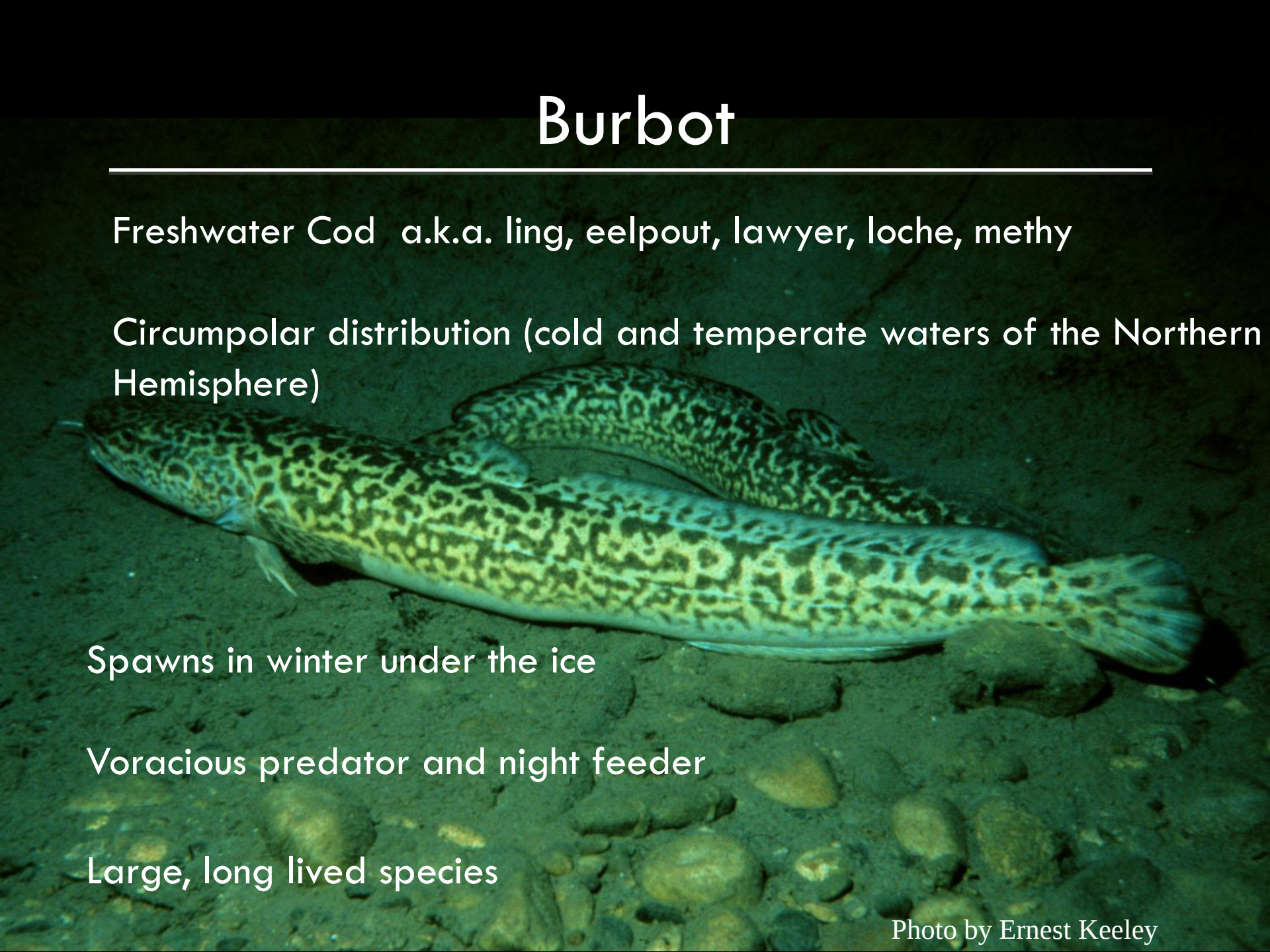
Future

- Address system capacity and potential productivity/habitat issues
- Revise and adjust stocking goals and brood stock numbers based on population demographics
- Address potential imprinting with upstream rearing site – spread the risk
- Implement critical upgrades to existing facility and construct new facility
- Use NPPC hatchery planning process and science review to guide implementation

Burbot

Freshwater Cod a.k.a. ling, eelpout, lawyer, loche, methy

Circumpolar distribution (cold and temperate waters of the Northern Hemisphere)



Spawns in winter under the ice

Voracious predator and night feeder

Large, long lived species

Photo by Ernest Keeley

British Columbia Ministry of Environment

IDFG documents population decline –

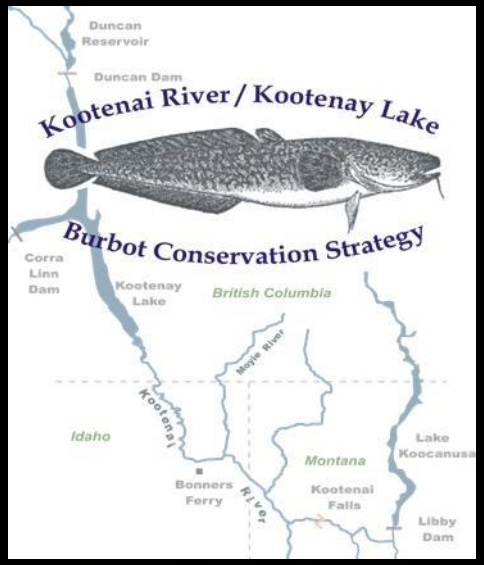
By 2003 the Lower Kootenai population is estimated to be <50 fish

Idaho Dept of Fish and Game

Burbot conservation strategy

Goal - reestablish a native burbot population in the lower Kootenai River

- conservation aquaculture
- habitat restoration
- alternative hydro operations plan
- monitoring and evaluation
- education and outreach

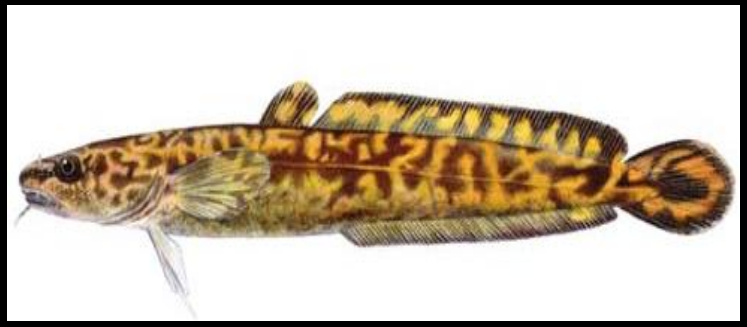


Development of aquaculture methods for burbot

- Initiated in 2003 as collaboration between the Tribe, U of I, BC MoE, IDFG, and USFWS
- Basic culture methods have now been established and documented for spawning, egg incubation, larval rearing, juvenile grow out
- Supports early hypothesis that culture for conservation purposes is feasible
- Disease susceptibility studies have provided information needed for approval of experimental releases

Development of aquaculture methods for burbot

- Continue critical uncertainties research (i.e. disease susceptibility etc)
- Continue small scale extensive rearing experiments in local ponds
- Monitor experimental releases of hatchery produced burbot
- Build experimental facility and ponds to provide increased numbers of burbot for release and subsequent monitoring



Kootenai River native fish conservation aquaculture master plan – step 1

- Organized to combine information for both sturgeon and burbot into one plan to streamline review and reduce redundancy
- Independent facilities are proposed due to distinct biological requirements
- Certain aspects of each program can reflect efficiencies through shared components when possible (i.e. staff, facilities, M&E)

Kootenai River native fish conservation aquaculture master plan – sturgeon

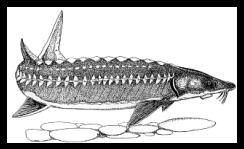
- Upgrades to existing hatchery to improve fish culture practices (includes water supply tempering, transport, etc)
- Development of additional upstream facility to increase brood stock holding, egg incubation and juvenile rearing and to allow sturgeon to imprint and rear on waters upstream of Bonners Ferry
- Addresses Tribal Restoration Objectives, Subbasin Plan Objectives, and 2006 USFWS Biological Opinion RPA Component 4

Kootenai River native fish conservation aquaculture master plan – burbot

- Develop experimental aquaculture facility to address need for rehabilitation of the burbot population in the Kootenai (using phased research approach)

- Addresses Tribal Restoration Objectives, Subbasin Plan Objectives, and Burbot Conservation Strategy Objectives -Memorandum of Understanding signed by 16 agencies and entities

Kootenai River native fish conservation aquaculture master plan – step 1



Sturgeon Production Target:

- Produce up to 1,500 Age 1 Kootenai sturgeon per family (for release of up to 40 families annually)

- ***Sturgeon Population Target:***

- 8,000 to 10,000 adults with healthy age class structure

Burbot Production and Population Target:

- Produce and stock burbot at rates and frequencies to sustain a target population of 2,500 to 9,500 adults in three different spawning areas with healthy age class structure

Kootenai River native fish conservation aquaculture master plan – conceptual design

- development of bioengineering criteria for each life stage of each cultured species
- development of annual water budgets for all aspects of sturgeon, burbot and live feed fish culture
- water supply and site analysis
- conceptual design of upgrades to existing facility
- conceptual design of Twin Rivers facility
- conceptual design of sturgeon spawning channel, remote incubation, and burbot rearing ponds


Mission Rd
Cr-38a
© 2006 Navteq
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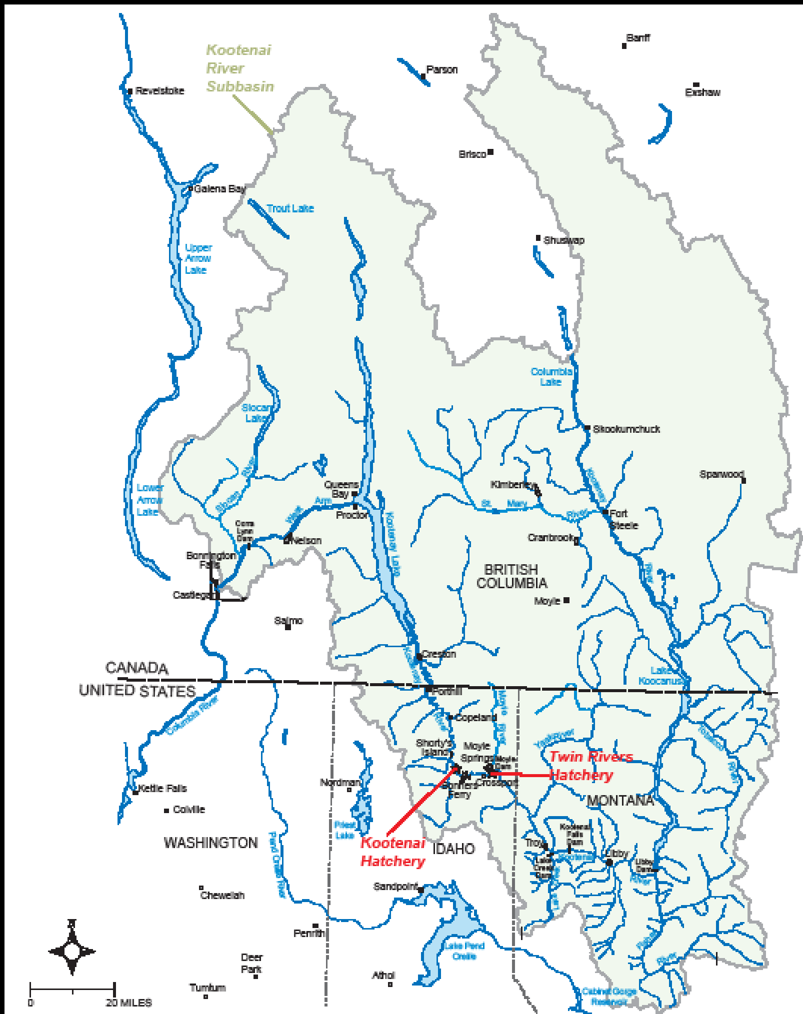
Kootenai River Subbasin
Revelstoke
Parson
Banff
Exshaw
Brisco
Galena Bay
Trout Lake
Upper Arrow Lake
Shuswap
Columbia Lake
Skookumchuck
Slocan Lake
Kimberley
Sparwood
Lower Arrow Lake
Queens Bay
Proctor
Fort Steele
Cranbrook
Nelson
Bonnington Falls
Castlegar
BRITISH COLUMBIA
Moyie
Salmo
Creston
CANADA
UNITED STATES
Lake Koocanusa
Porthill
Copeland
Moyie Springs
Crossport
Twin Rivers Hatchery
MONTANA
Kettle Falls
Colville
Nordman
Kootenai Hatchery
IDAHO
WASHINGTON
Troy
Libby
Chewelah
Sandpoint
Penrith
Lake Pend Oreille
Deer Park
Athol
Tumtum
Cabinet Gorge Reservoir
0
20 MILES


Kootenai National Wildlife Refuge
Kootenai White Sturgeon Hatchery
2
2
2
Moyie Springs
Twin Rivers Hatchery
Kootenay River
Crossport
Bonners Ferry
Railroad
Kaniksu National Forest
N

Program areas and major milestones

- Planning and Design Step 1 – 2008 through 2010
- Planning and Design Step 2 (and Environmental Compliance) – 2010 through 2011
- Planning and Design Step 3 (Final Design) – 2011 through 2012
- Construction and Capital Equipment - 2012 through 2013
- Annual Expanded Operations and Maintenance – 2013 and beyond
- Annual Expanded Monitoring and Evaluation – 2013 and beyond

Key expenditures by program area

- Planning & Design Step 1- $490,000 (estimated cost to date)
- Planning & Design Step 2 - $1,047,000
- Planning & Design Step 3 - $1,017,000
- Construction (Base & Separable Components) $15,251,000
- Capital Equipment $424,000
- Environmental Compliance Step 2 (Permitting, EA, etc.) $165,000

ISRP comments and recommendation

The ISRP was appreciative of the extensive detail provided in the response document and the revised Master Plan and found that the revised Master Plan meets requirements for proceeding to Step 2 (Qualified) for the Kootenai white sturgeon component of the master plan and meets requirements for proceeding to Step 2 for the burbot component (ISRP Document 2010-27)

Additional information requested in step 2 for sturgeon

- establish quantitative benchmarks and a decision pathway to adjust production goals
- refine the monitoring program to collect the necessary data to determine if benchmarks are being met or exceeded
- provide additional details regarding the rationale and justification as to the need for additional hatchery capacity

Additional ISRP comment about burbot component of master plan

The ISRP appreciated the detailed burbot Hatchery and Genetic Management Plan (HGMP) and the phased program design based on the research aspects regarding burbot habitat requirements and limiting factors, as so little is known of their life history in the subbasin and elsewhere

The future

Successful restoration will depend on the timely implementation of the ***conservation aquaculture program*** as well as the timely implementation of ***ecosystem scale habitat improvements***