Northwest **Power** and **Conservation** Council

March 7, 2017

MEMORANDUM

TO: Fish and Wildlife Committee

FROM: Nancy Leonard

SUBJECT: Bull Trout presentation by USFWS-Wenatchee

BACKGROUND:

Presenter: Judy Neibauer, Fish and Wildlife Biologist (USFWS)

Summary: Bull Trout biology can be similar yet different across their range. In the Upper Columbia area of Central Washington, bull trout exhibit several life history patterns. Providing access between forage and overwintering habitat and spawning and rearing areas is a priority. The final Recovery Implementation plan identifies actions at multiple scales.

Relevance: Bull trout is one of the focal (important) resident fish species for the program (Appendix N). Bull trout are addressed under the *Resident Fish Mitigation* and the *Mainstem Hydrosystem Flow and Passage Operations* Program Strategies The general measures under the *Mainstem Hydrosystem Flow and Passage Operations* strategies are from existing USFWS biological opinions, as well as Columbia River Fish Accords, addressing Bull Trout in the Columbia River Basin are the baseline flow and passage measures for the Program, including actions, flow objectives, and passage standards (see general measures third bullet). The 2014 Program has an interim bull trout population objective of maintain a stable and increasing population trend. Bull Trout is one of the species targeted as part of the Program's *refine program goals and objectives task*.

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Background:
In the 1800's bull trout were recognized for their unique attributes as a salmonid. Bull trout overlap in habitat with many salmonids, but have unique biology and habitat requirements. They overlap with salmon in many places. The USFWS focuses on the 4 C's (cold, clean, complex, and connected) to describe their habitat. They are an excellent indicator of clean water.

Newer information gained from genetics, radio- telemetry, and PIT tagging shows diversity in movement patterns and the importance of connectivity. Since 2000 we better understand how and when bull trout move between spawning and rearing and forage and overwintering areas. Juveniles generally stay within the spawning and rearing streams. Sub-adult and adult bull trout can move long distances. This is also observed in Canada, off the Washington Coast, and in Montana. Migratory bull trout can be holding in their spawning habitat as early as the first week of July, while spawning occurs generally between the late August to late October or early November. Juveniles can out-migrate throughout the spring, summer, and fall. Adult and sub-adult bull trout use their forage, migration, overwintering habitats year round (i.e., mainstem Columbia River, lakes, and marine habitats).

Recovery Planning has been occurring since 2002, and in 2015 the USFWS released a final recovery plan with new recovery units. Final Recovery Unit Implementation Plans (RUIPS) describe bull trout core areas and forage, migration, and overwintering areas (FMO). In Central Washington, a local Yakima Bull Trout Action Plan links to the RUIP, and partners plan to complete an action plan for the Wenatchee, Entiat, Methow Core areas. We have information about bull trout using the Okanogan and NE Washington areas, and Lake Chelan is a historic core area. A new transboundary core area with Canada (Salmo River) is described.

Recovery goals are to address threats to maintain core area and local populations. When recovered we expect bull trout to be geographically widespread across representative habitats and to be demographically stable; to have conserved genetic diversity and diverse life history forms; and to have conserved and connected cold water habitats.

More Info:
- BT Recovery Plan – http://www.fws.gov/pacific/bulltrout
- Middle Columbia Recovery Unit Implementation Plan - https://www.fws.gov/pacific/bulltrout/pdf/Final_Mid_Columbia_RUIP_092915.pdf
- BT Critical Habitat – https://www.fws.gov/pacific/bulltrout/FinalCH2010.html
- Yakima Bull Trout Action Plan - http://ykfp.org/par15/PDF/Bull%20Trout%20Abundance%20June%202015.pdf
- Telemetry Information - https://www.fws.gov/LeavenworthFisheriesComplex/MidColumbiaRiverFRO/reports.html#bull
- PIT tag information – PTGIS

- Genetic baseline – I will send the file to you…

The general measure for water management and fish passage actions, flow objectives, and passage standards from the *Mainstem and Fish Passage* program strategy cite the below USFWS biological opinion:

- U.S. Fish and Wildlife Service, *Biological Opinion: Effects to Listed Species from Operations of the Federal Columbia River Power System*(December 2000)
- U.S. Fish and Wildlife Service, *Biological Opinion regarding the effects of Libby Dam operations on the Kootenai River White Sturgeon, Bull Trout and Kootenai Sturgeon Critical Habitat* (February 2006)
- U.S. Fish and Wildlife Service, *Biological Opinion on the Continued Operation and Maintenance of the Willamette River Basin Project and Effects to Oregon Chub, Bull Trout, and Bull Trout Critical Habitat Designated Under the Endangered Species Act* (July 2008).

Central Washington Bull Trout: Connecting Recovery to Mainstem Rivers

Photo Credit: Joel Sartore, National Geographic & Wade Fredenberg, USFWS.

March 14, 2017

Judy Neibauer, CWFO, Wenatchee, WA,
Central WA Bull Trout Recovery Coordinator

"No higher praise can be given to a Salmonid than to say it is a char."

Photo Credit: Scott Craig, USFWS

"The members of this genus (Salvelinus) are by far the most active and handsome of the trout. They live in the coldest, cleanest and most secluded waters."

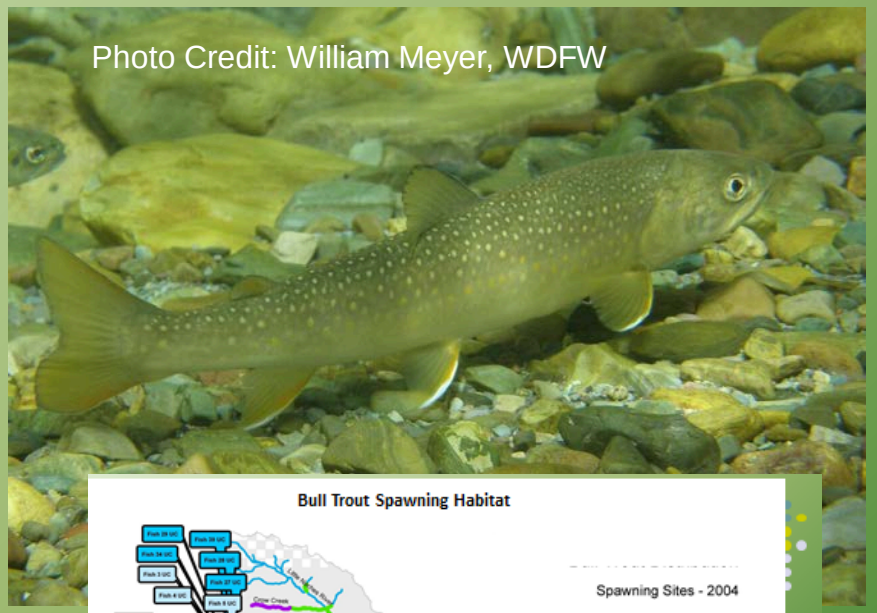
Jordan & Everman

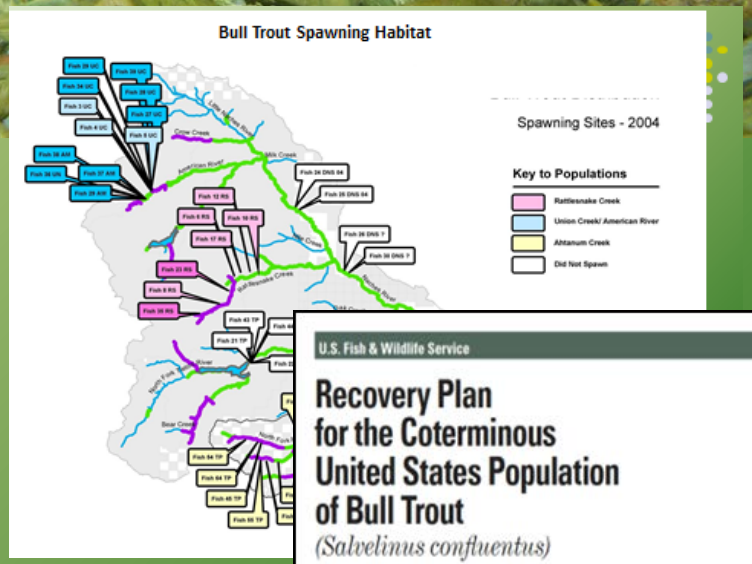
1896

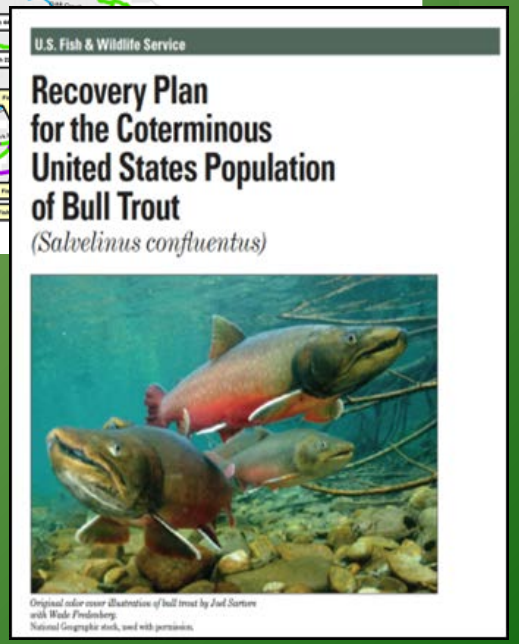
Recognized as a separate species (from Dolly Varden) since 1980 by American Fisheries Society

Overview:

- **Biology/Life History**
  - 4C's
  - Uniqueness
  - Differences from Salmon
- **Migrations/Movements**
  - Spawning and FMO
  - Seasonal/Annual
- **Recovery Planning**
  - History
  - Strategy
  - Tools
  - Implementation







The 4Cs to a Healthy Bull Trout -

Cold, Clean, Complex, and Connected Habitat

- WATER: Cold, Clean, and Connected habitat for spawning, overwintering, rearing
- SHELTER: Complex habitat with deep pools for overwintering and instream wood, undercut banks, overhanging vegetation, aquatic vegetation for cover. They need clean, loose streambed substrates for spawning
- FOOD: Connected habitat to forage (aquatic and terrestrial insects, crustaceans, and other fish), Migration, and overwintering

Spawning

Migratory Redds, ScCS Meeting 2015

- Sexually mature at ages 5-7
- Spawning migration –
  May and July but sometimes later
- Migrations are extensive (over 150 miles)
- Spawning occurs from late August through October
- Prefer areas with inflow of groundwater, springs, or snow melt
- Spawning: generally below 9°C (48.2°F)
- Repeat spawners - Spawn every year, every two, or even every three years

Bull Trout and Salmon Temperature Differences

- **Bull Trout**
  - *Spawning: below 9°C (48.2°F)*
  - *Incubation: 2-6°C (35.5-42.8°F)*
- **Chinook salmon**
  - *Spawning: 10-17°C (50-62.6°F)*
  - *Incubation: 5-14°C (41-57.2°F)*
- **Coho salmon**
  - *Spawning:4.4-9.4°C (39.9-48.9°F)*
  - *Incubation: 4.4-13°C (39.9-55.4F)*

Cold Water = Higher Egg Survival

- **Bull Trout Incubation: 2-6ºC**
  (35.5-42.8ºF)

  - **<u>80-95%</u> Survival at 2- 4ºC**
    (35.5-39ºF)
  - **<u>0-20%</u> Survival at 8-10ºC**
    (46.5-50ºF)

Egg Incubation - 220+ days… OR ~*a whole school year*

(Cutthroat: 30 days; Rainbow: 51-55 days; Chinook: 150 days)

Juvenile Rearing Habitat …is Complex

- Near the stream bottom
- Between cobbles and boulders
- Near instream wood
- In side channels
- Near stream margins
- Mostly nocturnal

- **Cold water 4-10°C** (39-50°F)

- **15°C (59°F) limits distribution**

Photo Credit: Ashton Bunce, CWU

Bull Trout Life Histories:

Resident Forms

- **Reside in tributary streams throughout their lives**

- **Spawn, rear, mature, forage, and overwinter in smaller natal streams**

Bull Trout Timber Creek - Little Lost River,
Photo Credit: Bart Gammet, USFWS

Migratory Forms: River, Lake, Marine

- Rear in smaller tributaries
- Migrate to a larger water body to forage, mature, and overwinter
- Return to their natal streams to spawn


Photo Credit: Joel Sartore, National Geographic & Wade Fredenberg, USFWS.


Photo Credit: Shannon Downey, USFWS


Swan Lake, MT Photo Credit: USFWS


Photo Credit: USFWS

Bull Trout (*Salvelinus confluentus*) and Rainbow Trout/Steelhead (*Oncorhynchus mykiss*)

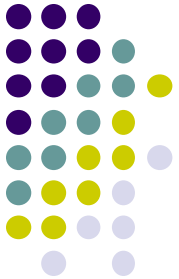
Photo Credit: Roger Tabor, USFWS

Bull Trout (*Salvelinus confluentus*) and Mountain Whitefish (*Prosopium williamsoni*)

Bull Trout in the Quinault River, Photo by Roger Peters, USFWS

Bull Trout and Brook Trout

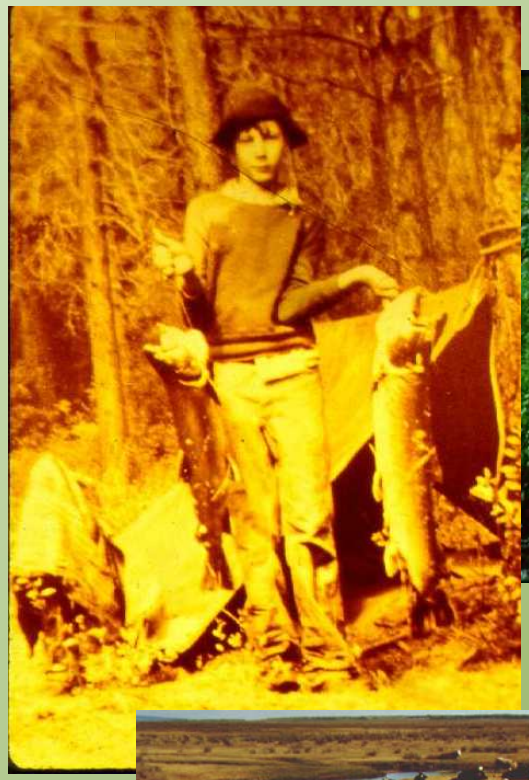
Differences Between Bull Trout and Salmon

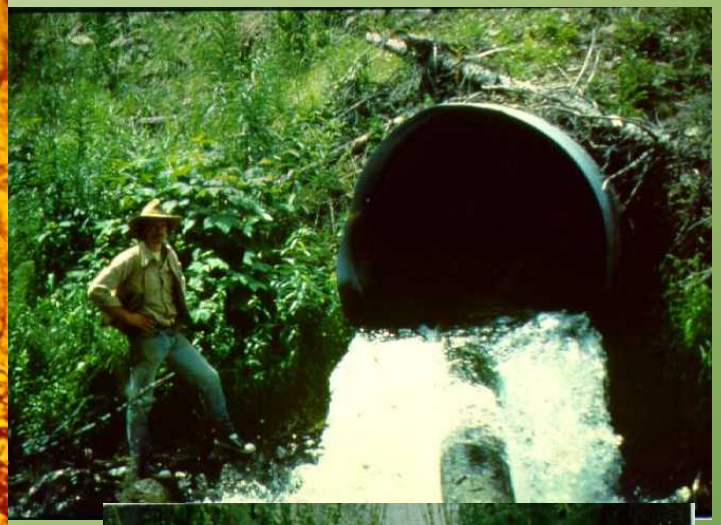


- Colder temperature requirements
- Generally spawn in headwater streams
- Very long incubation to emergence time (220+ days)
- Occur primarily in freshwater
- They don't generally die: They can spawn repeatedly and may live more than 13 years
- Juveniles need several years of invertebrate prey base
- Migratory adults are an apex predator and require migratory corridors connected to a prey base, good cover, and deep overwintering habitat
- Body colorings: Light spots on dark background
- Few population surveys & they require effort (Peterson et al 2002;Thurow et al 2004)

Myth busted: They are good to eat!

A Legacy of Threats





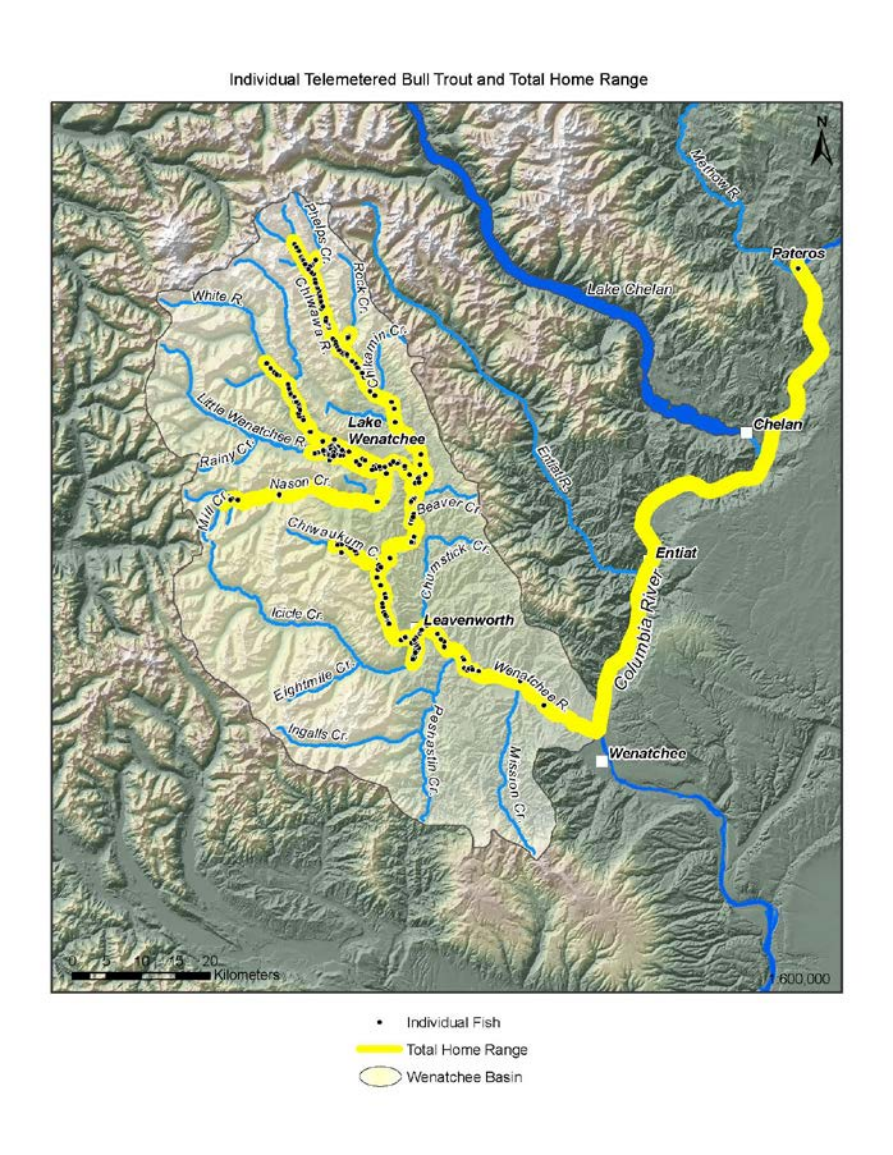
Migrations and Movements
…….are Critical to Survival

Overview: Wenatchee, Entiat, Methow and Yakima Basin migrations and movements.

Telemetry 2000-2004:
USFWS

Wenatchee Basin

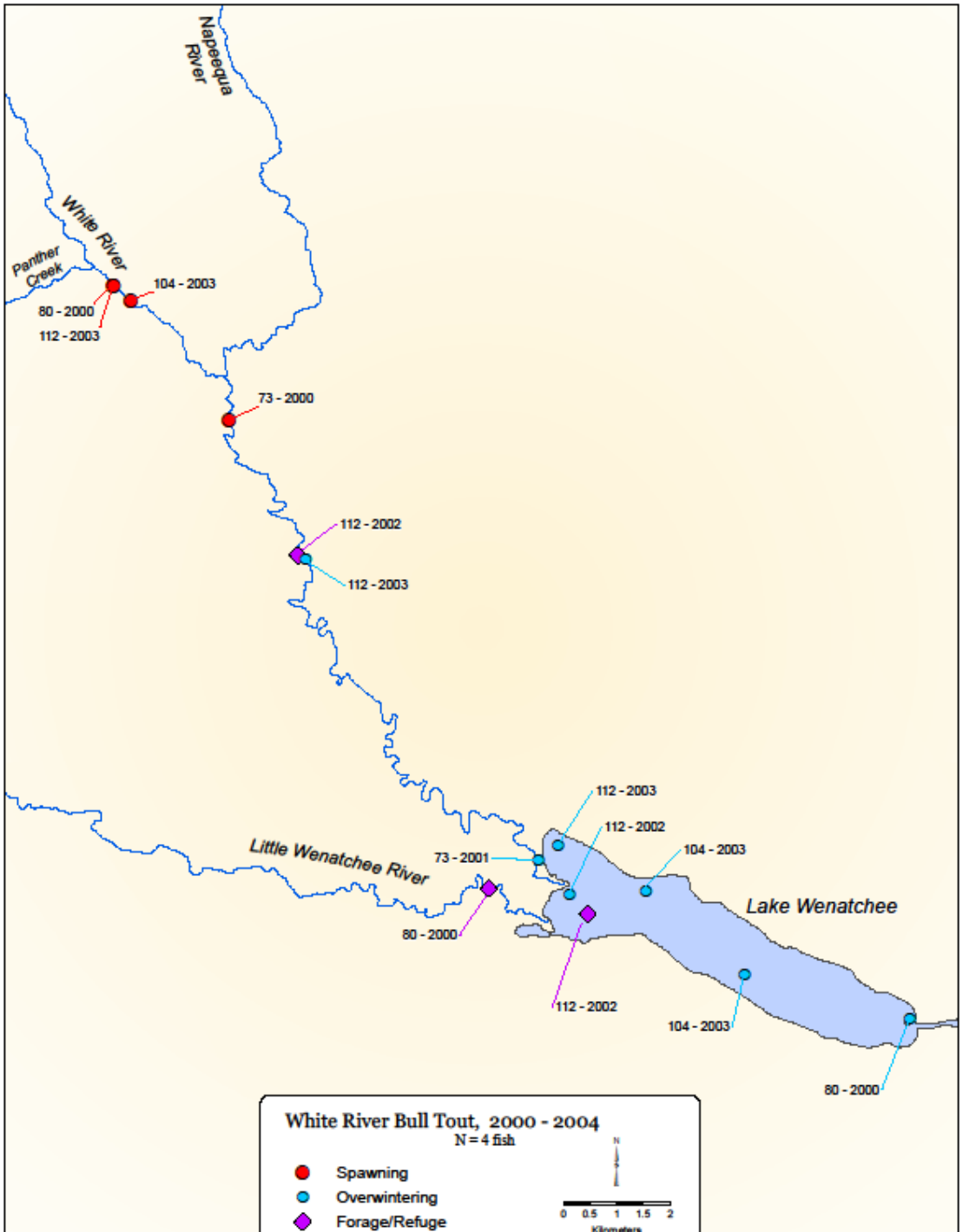
- 7 Local Populations (LPs)
- Populations used upper basin, middle basin, and lower basin
- Populations connected to Lake, Mainstem River, and Columbia River
- Walkabouts – long migrations
- Connectivity is good



*KellyRingel et al 2014

White River-

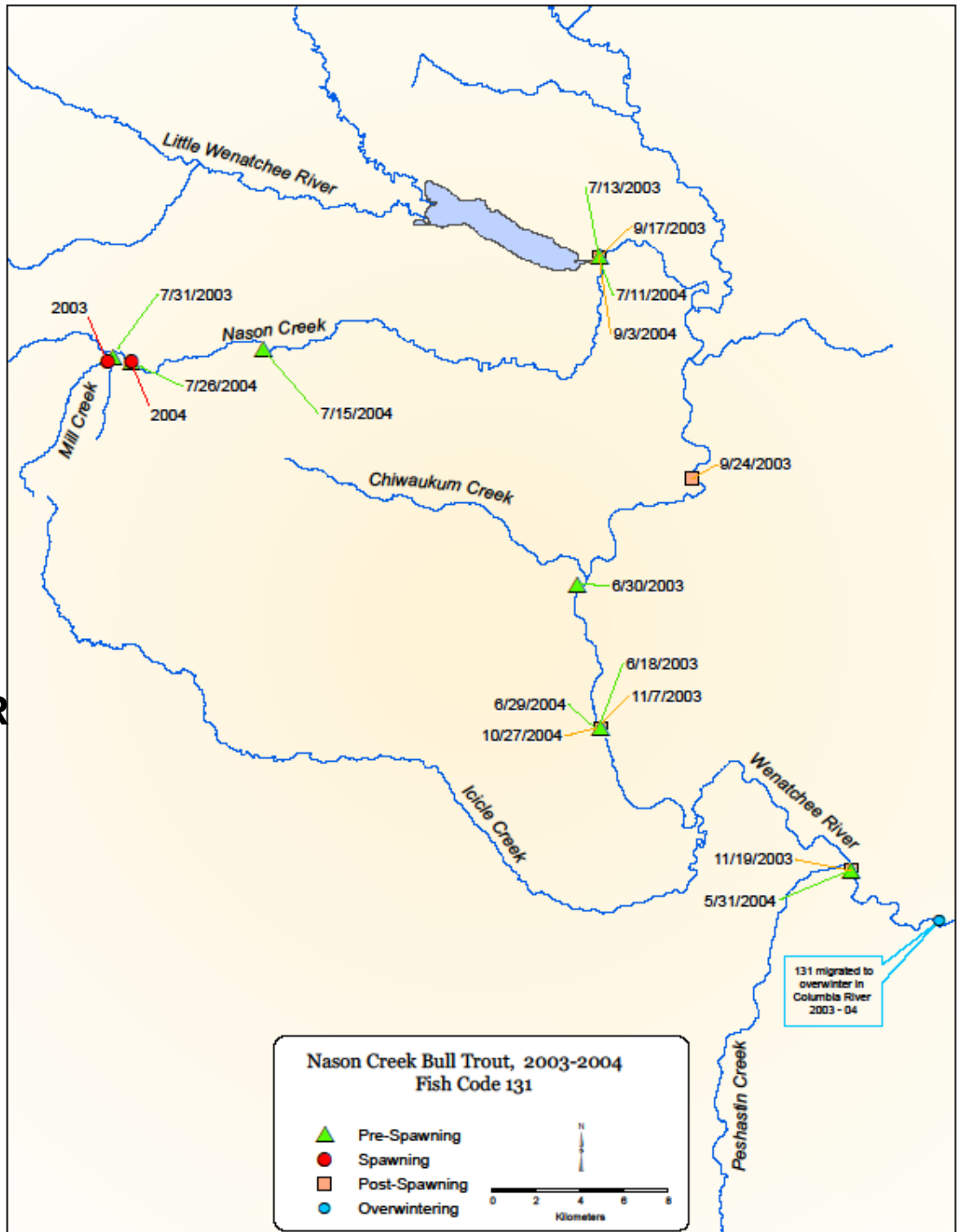
Moves mostly Back and forth to Lake



Nason Cr –
Top of
Stevens Pass
(Hwy 2)

Uses Columbia R

Wow!



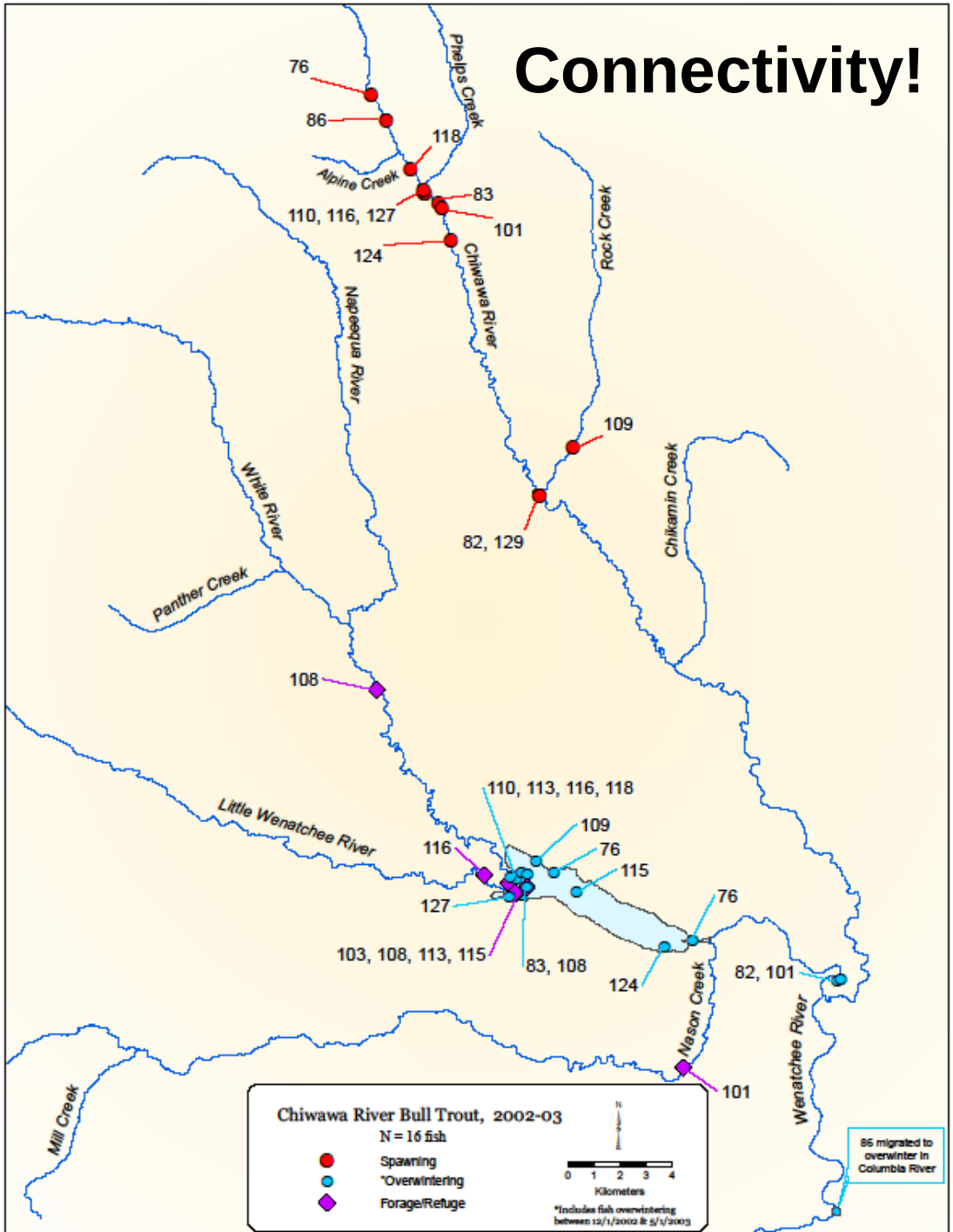
100+ miles one way

Connectivity!

Chiwawa –

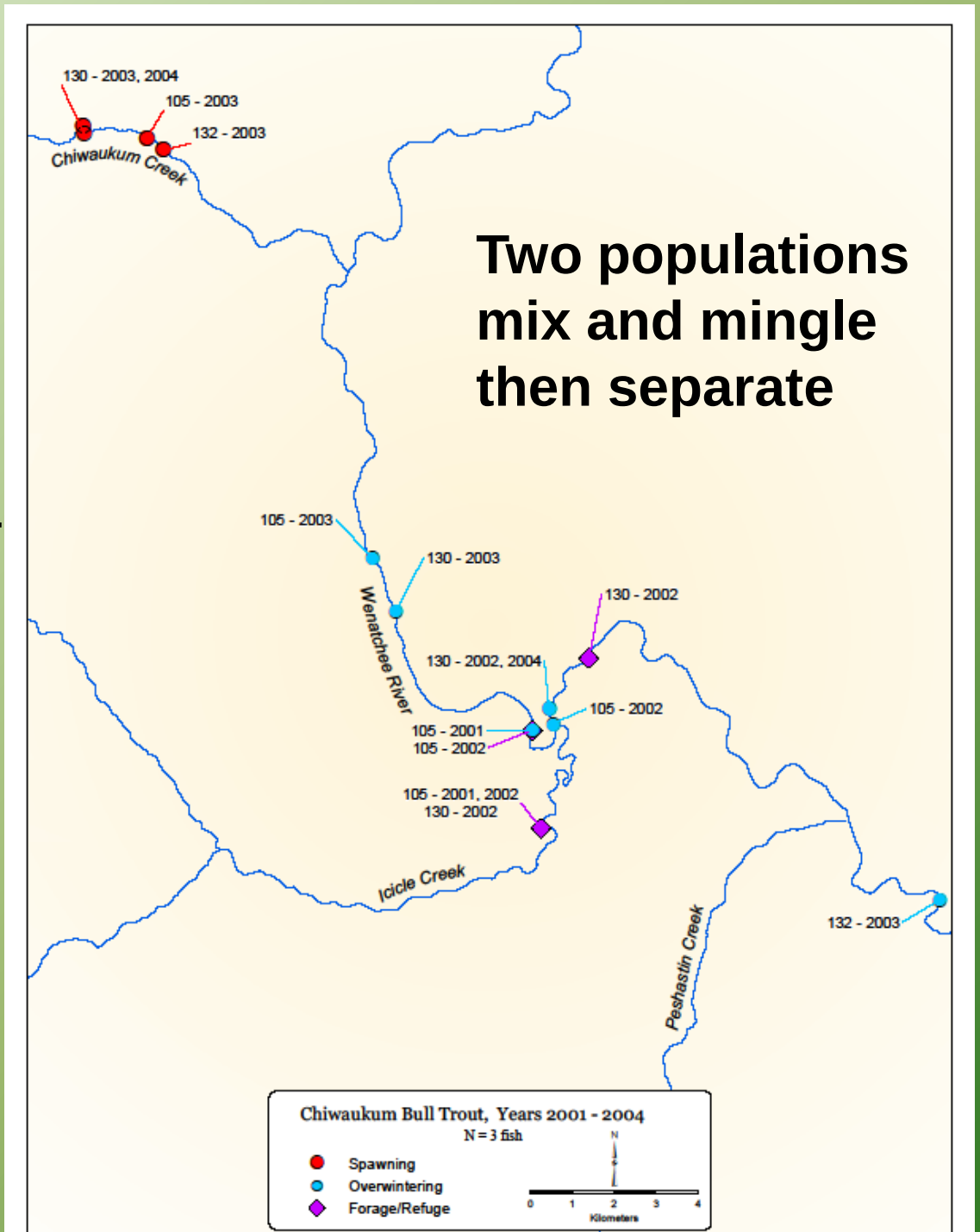
Uses Lake, Wenatchee R, and Columbia R

Seems to do it all!



Chiwaukum/Icicle-

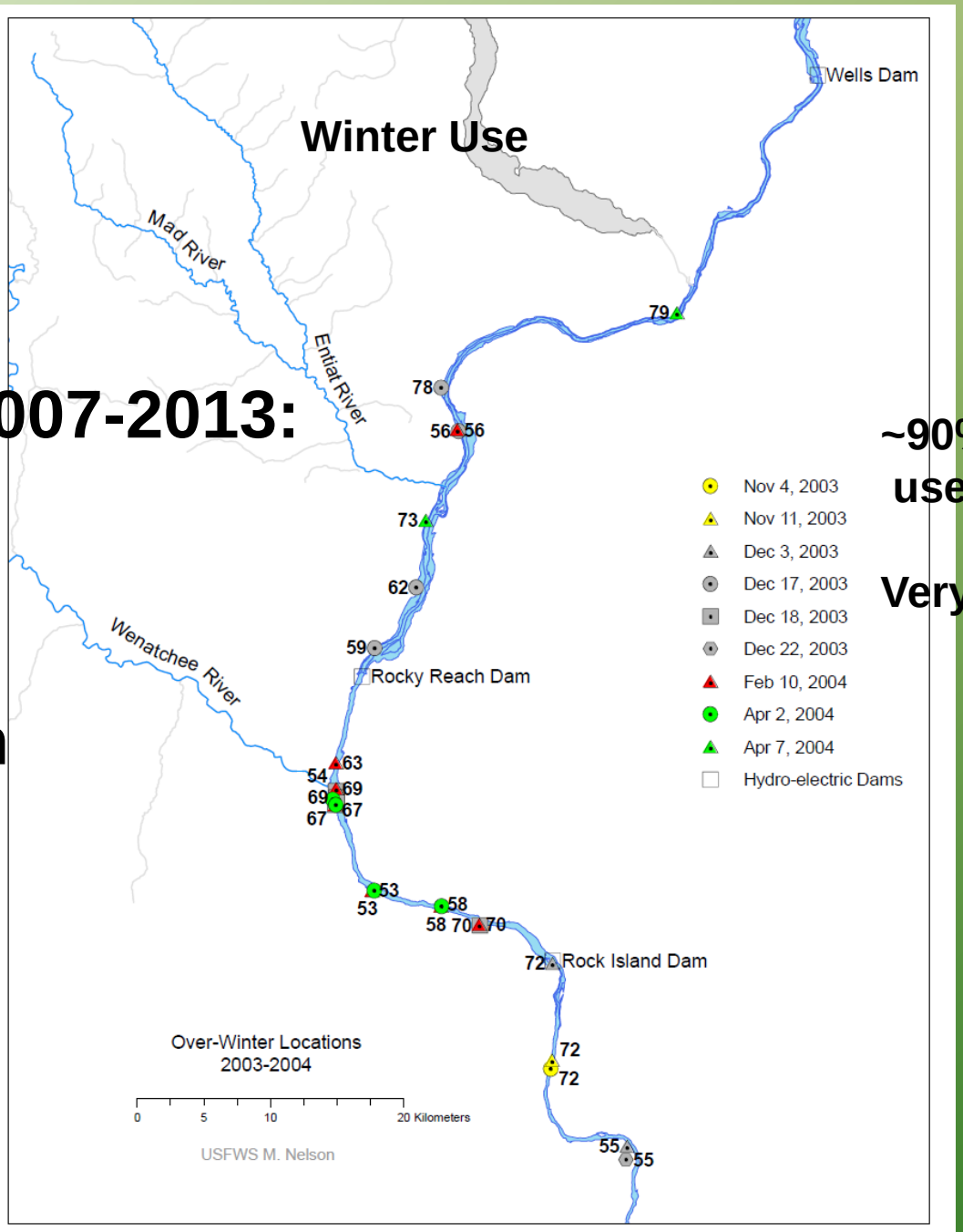
Some only used Middle Wenatchee R



Telemetry 2007-2013:
USFWS

Entiat Basin

Populations mix in Columbia R



~90% of Entiat Fish use Columbia R

Very low abundances

*Nelson 2014

Figure 54. Over-winter locations of USFWS-tagged bull trout during boat surveys conducted on nine dates in the Columbia River during fall and winter, 2003/2004.

Telemetry 2005 & 2006:

USFWS and Douglas PUD

Methow Basin

Methow bull trout Overwintering in Columbia River

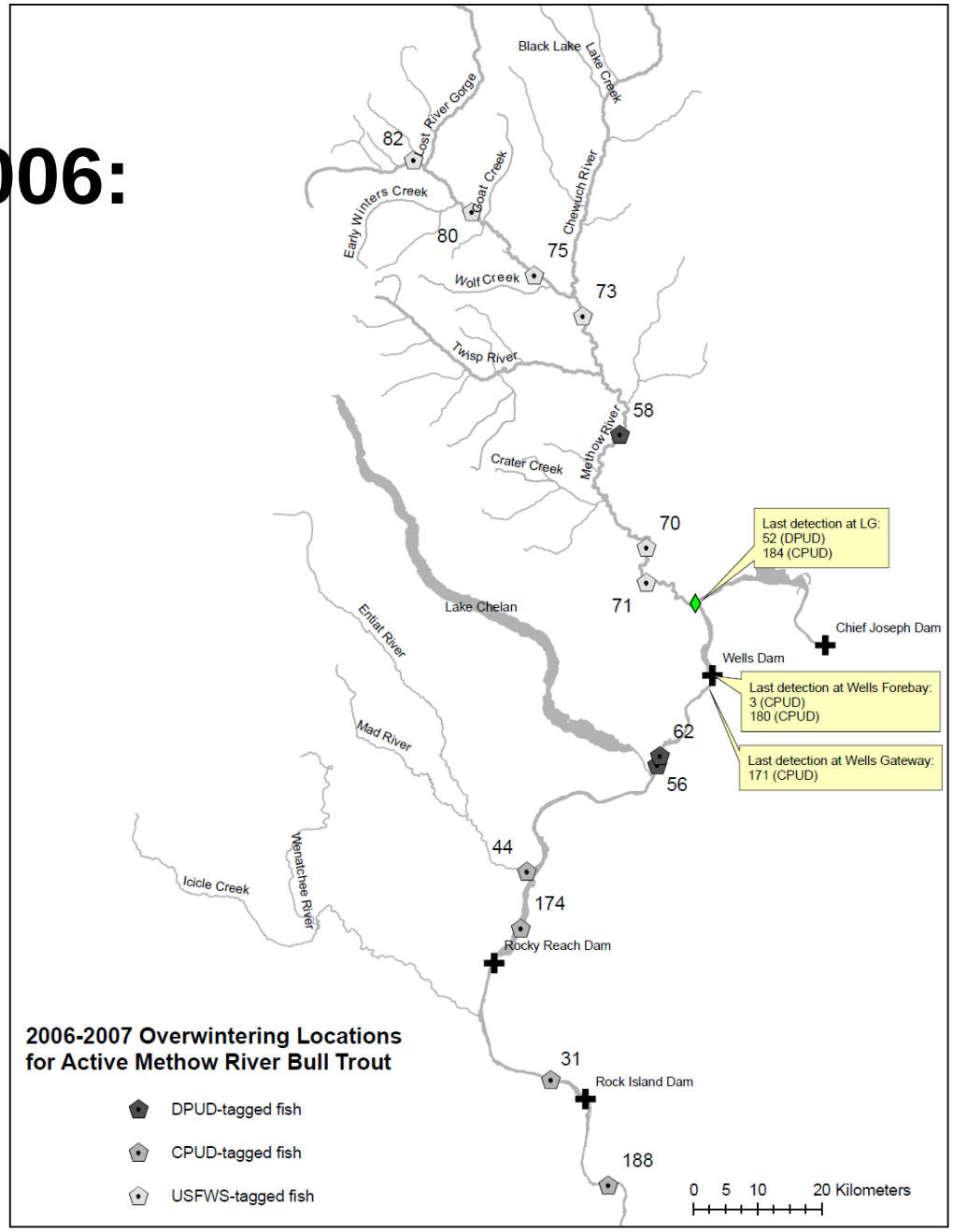


Figure 18. Map of the over-wintering locations of active radio-tagged bull trout that used the Methow River Core Area in 2006.

*Nelson et al 2007&2008

Methow (Continued)

Tagged in Columbia R

- Spawned in WFork Methow (N. Cascades)
- Overwintered in Columbia R

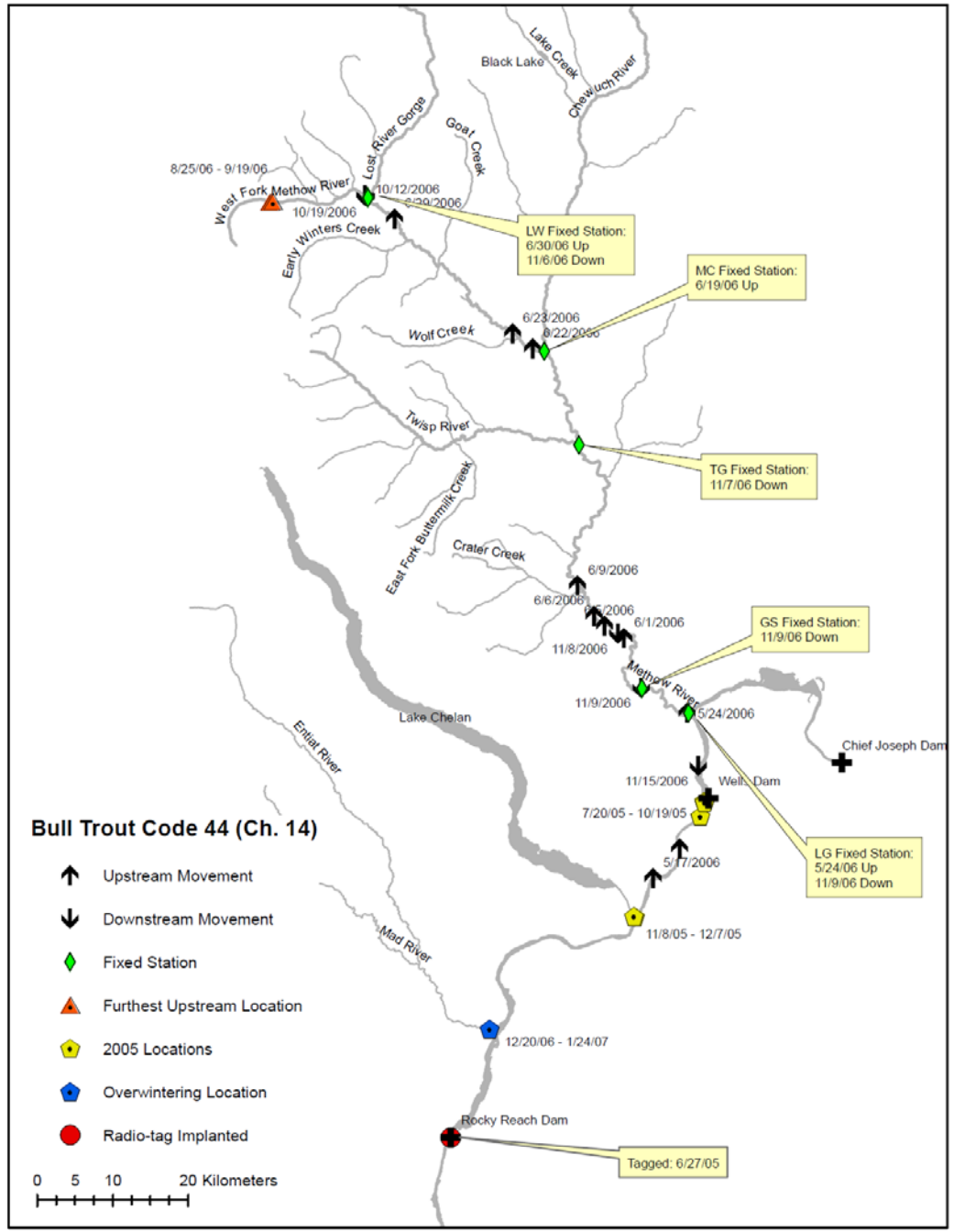


Figure 51. Map of radio-telemetry locations of CPUD bull trout code 44 in 2005 and 2006

Methow (Continued)

Lost R gorge….is it passable up to the lakes in some years?

Genetics show they key out as Lost River Fish

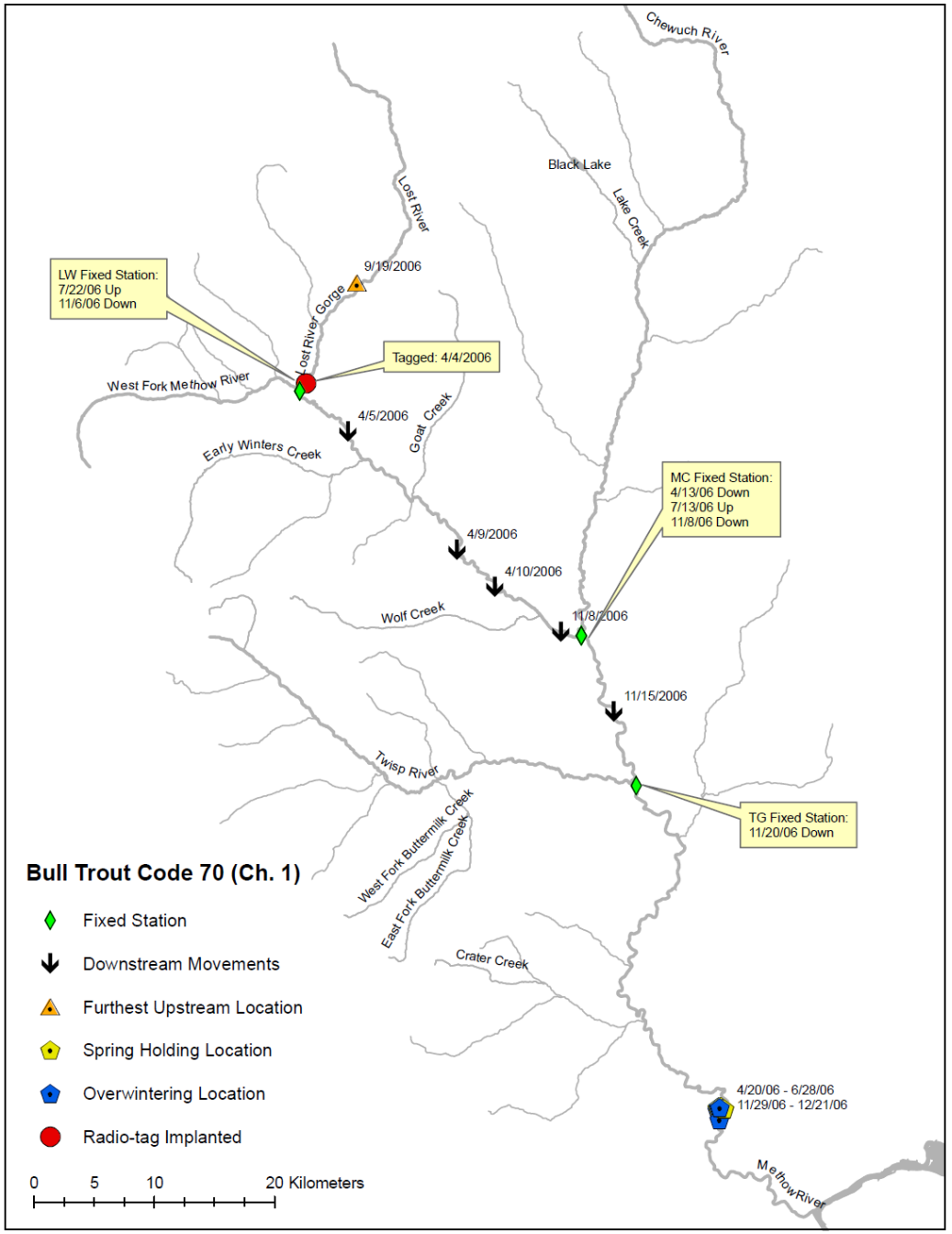


Figure 28. Map of radio-telemetry locations of USFWS bull trout code 70 in 2006.

Methow (Continued)

Movement between basins

One year in Methow,
One Year in Wenatchee

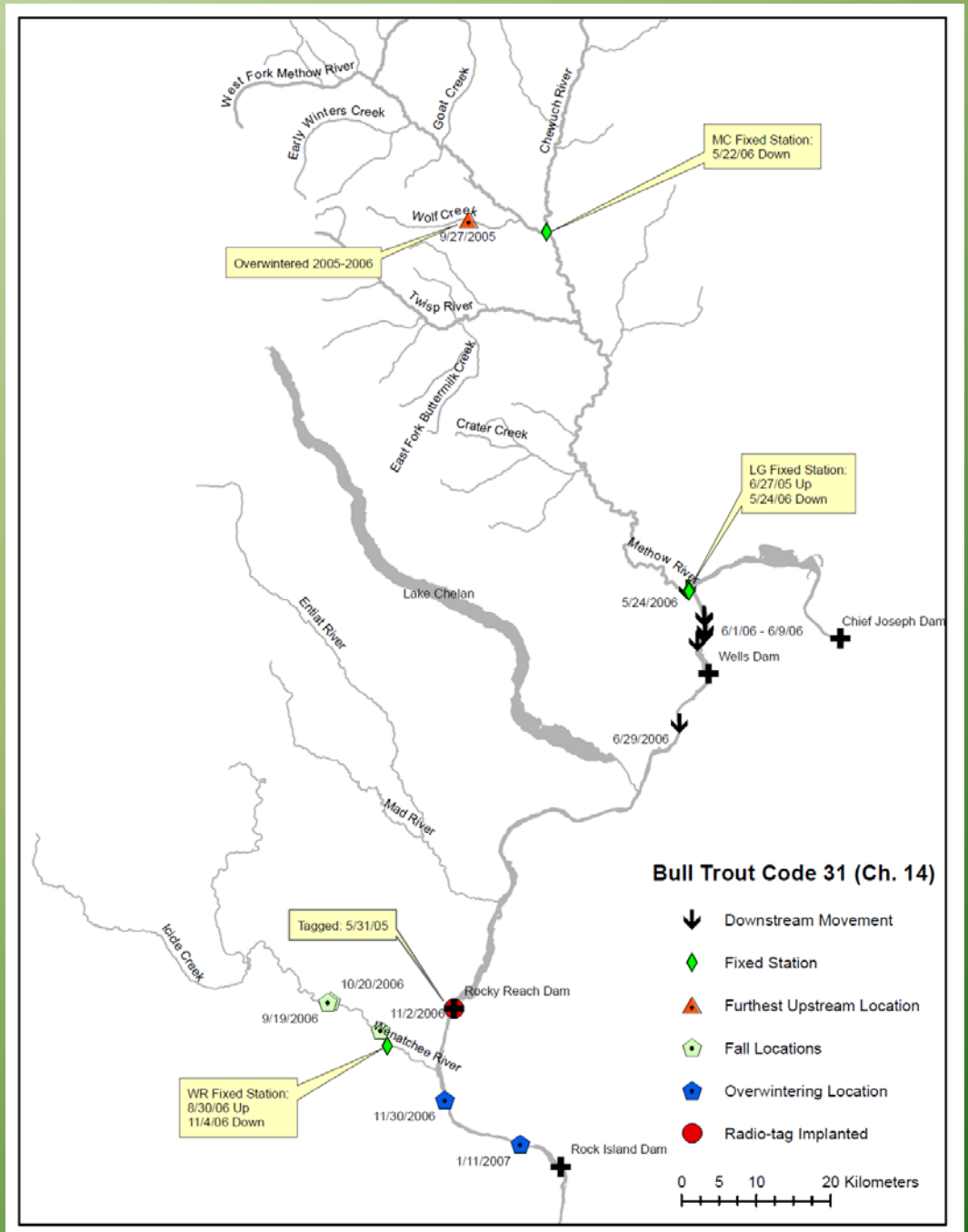
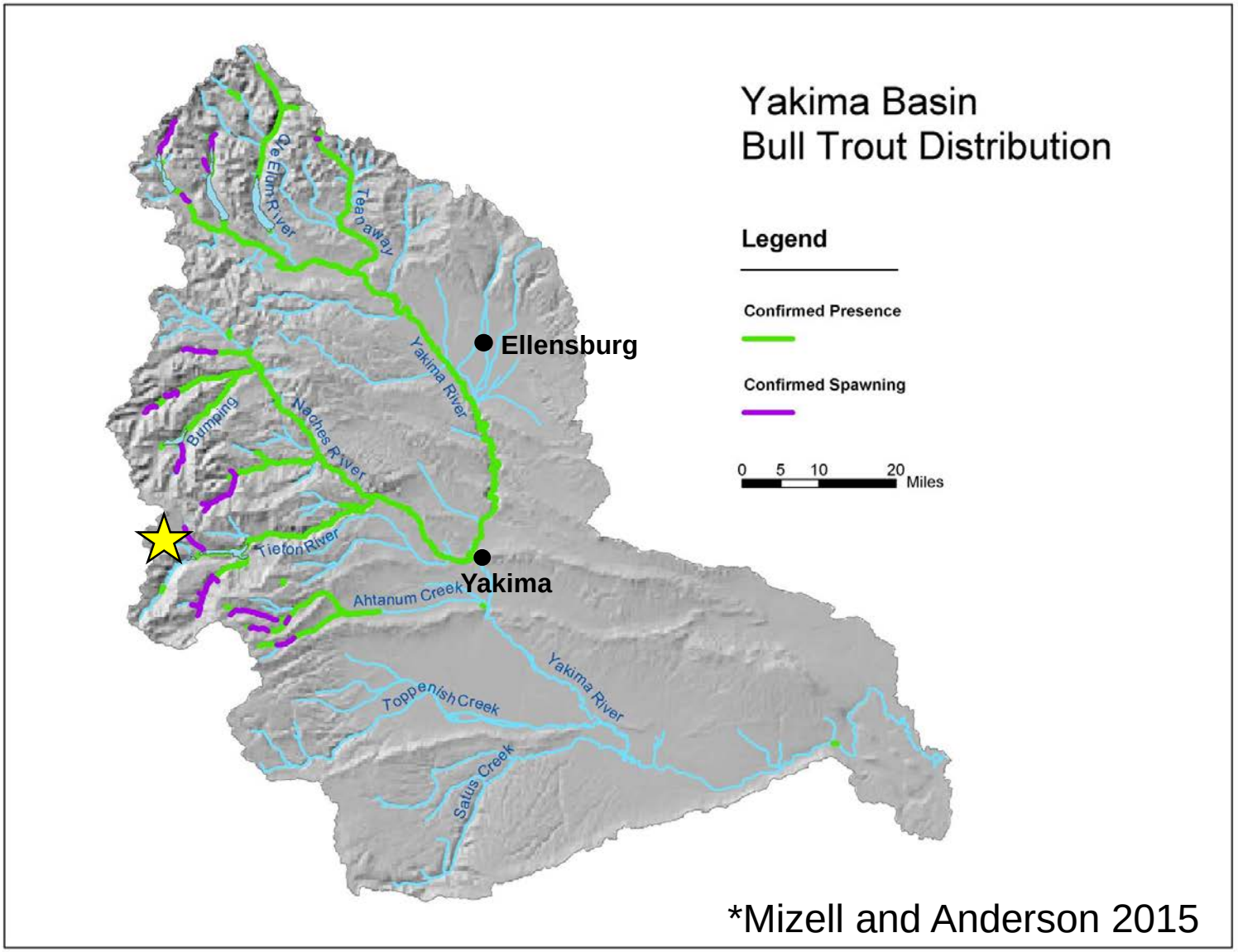


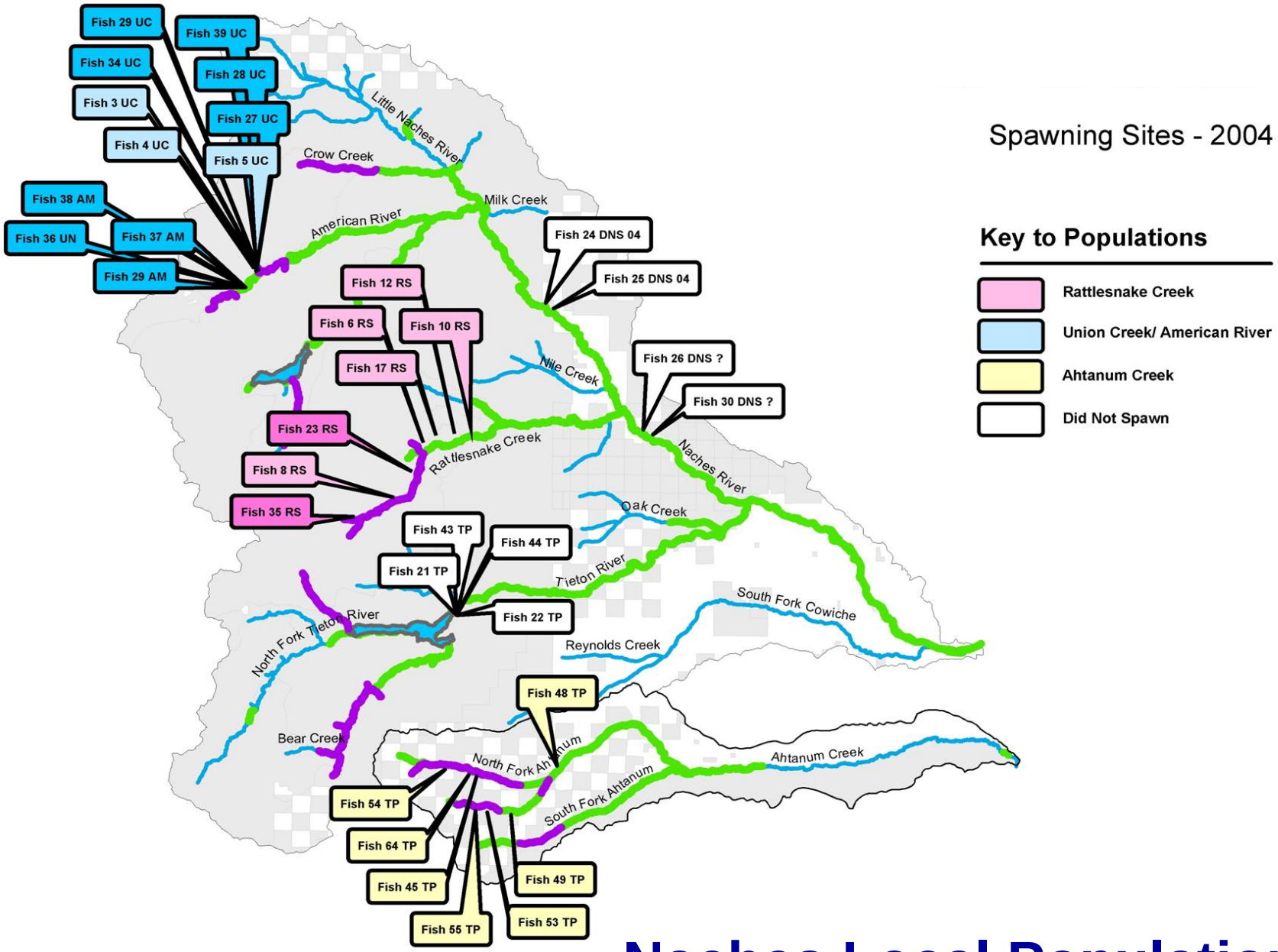
Figure 50. Map of radio-telemetry locations of CPUD bull trout code 31 in 2006.

Telemetry 2003-2006, WDFW



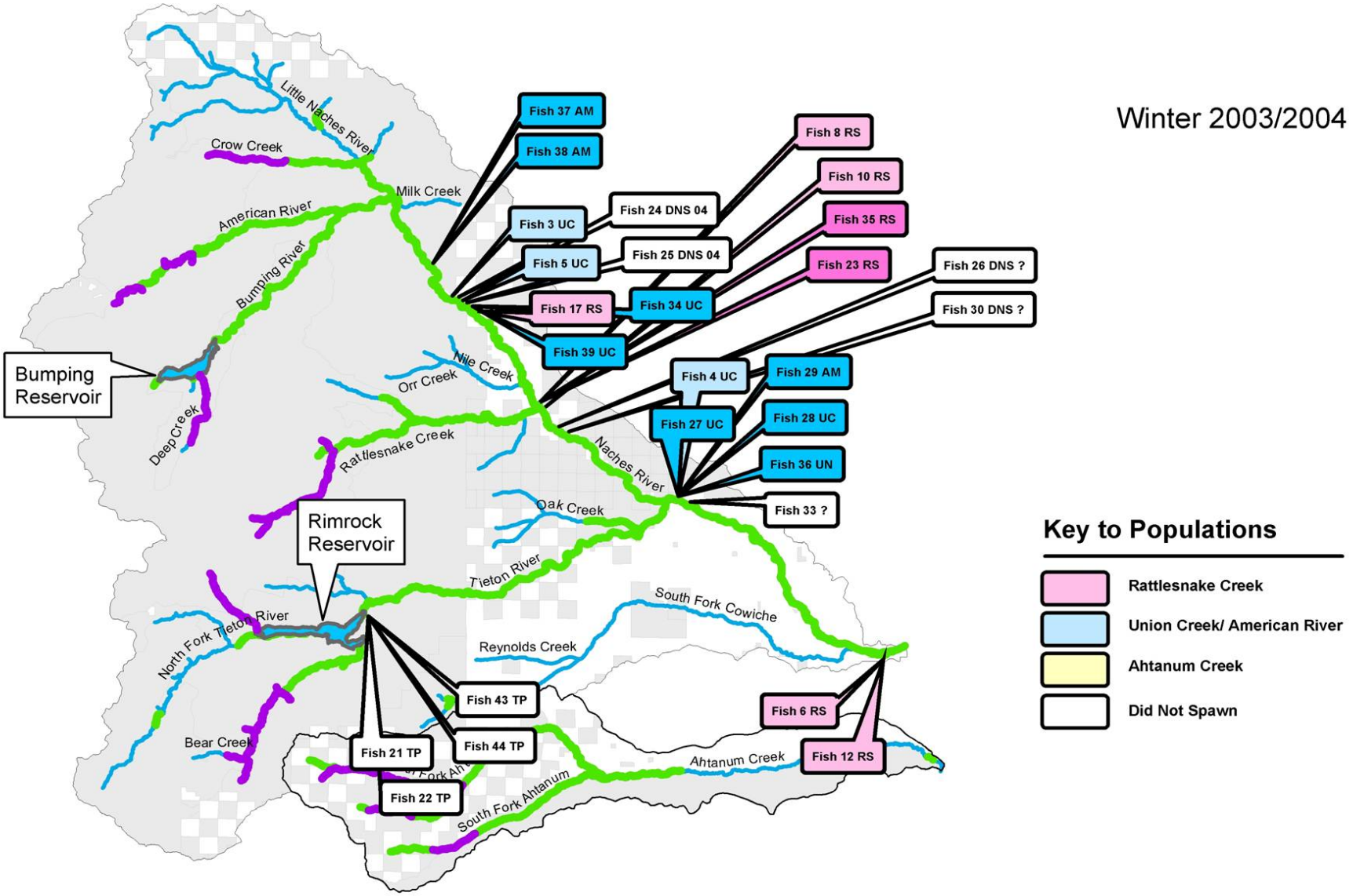
*Mizell and Anderson 2015

Bull Trout Spawning Habitat

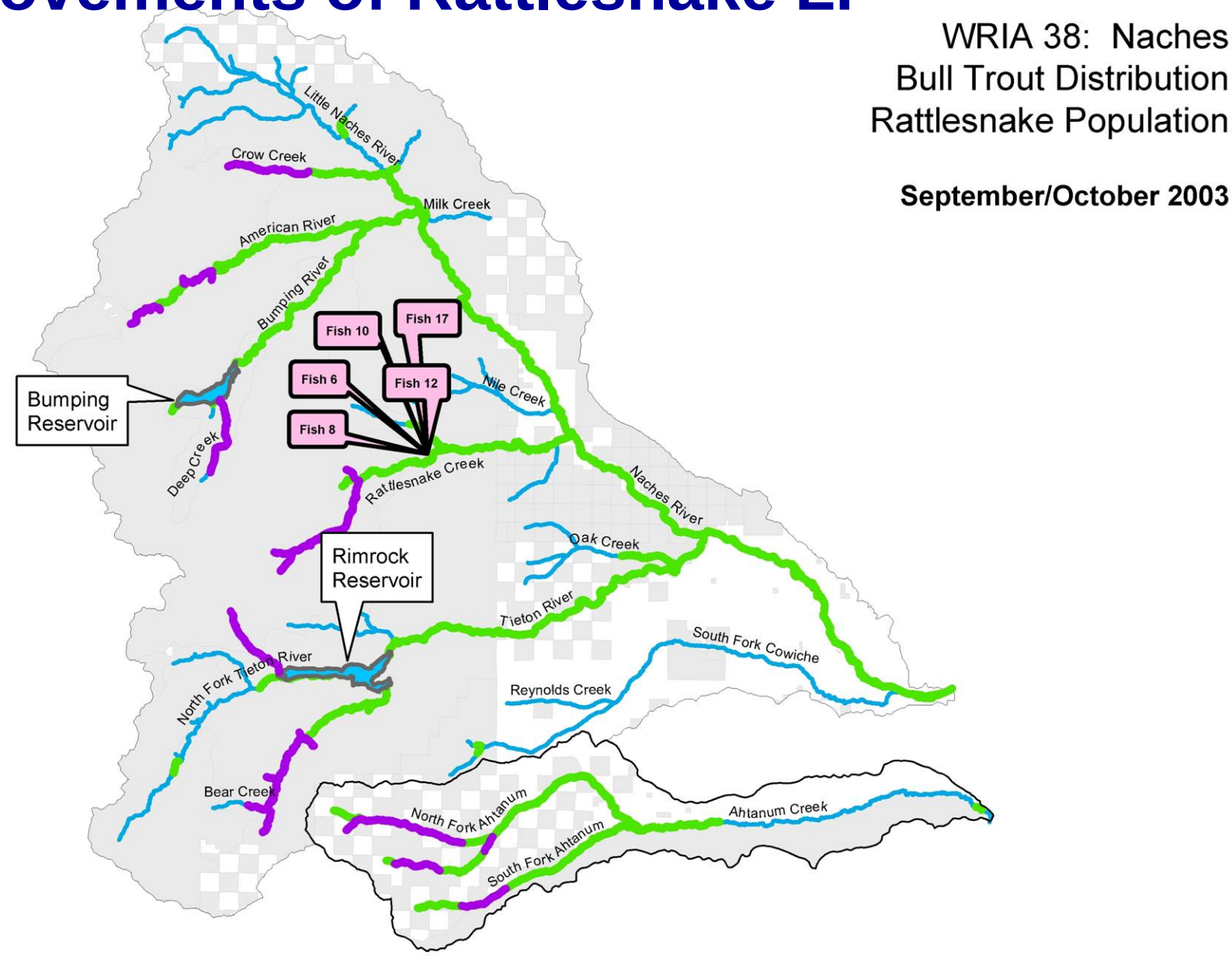


Naches Local Populations

Bull Trout Overwintering Habitat

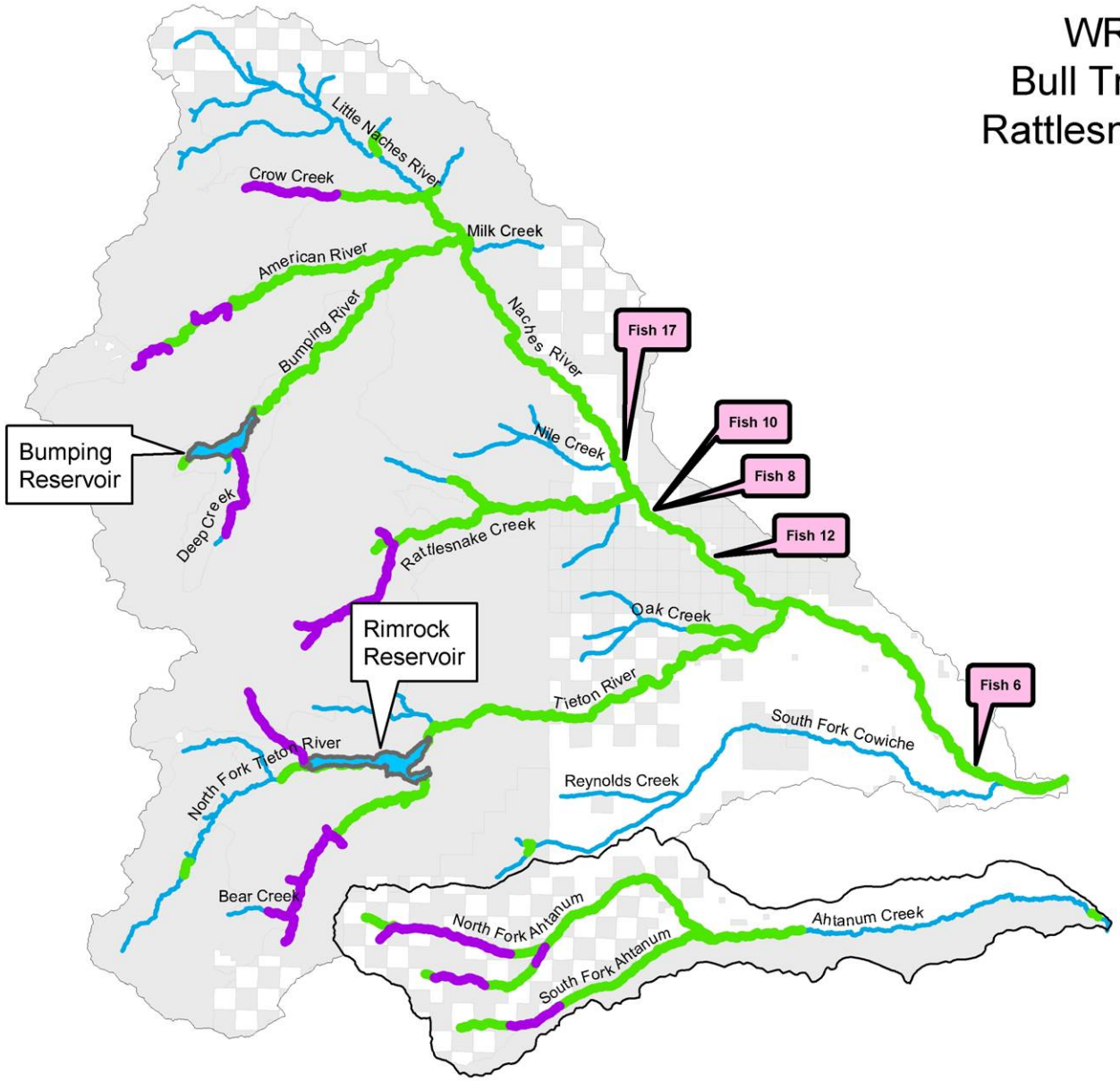


Movements of Rattlesnake LP



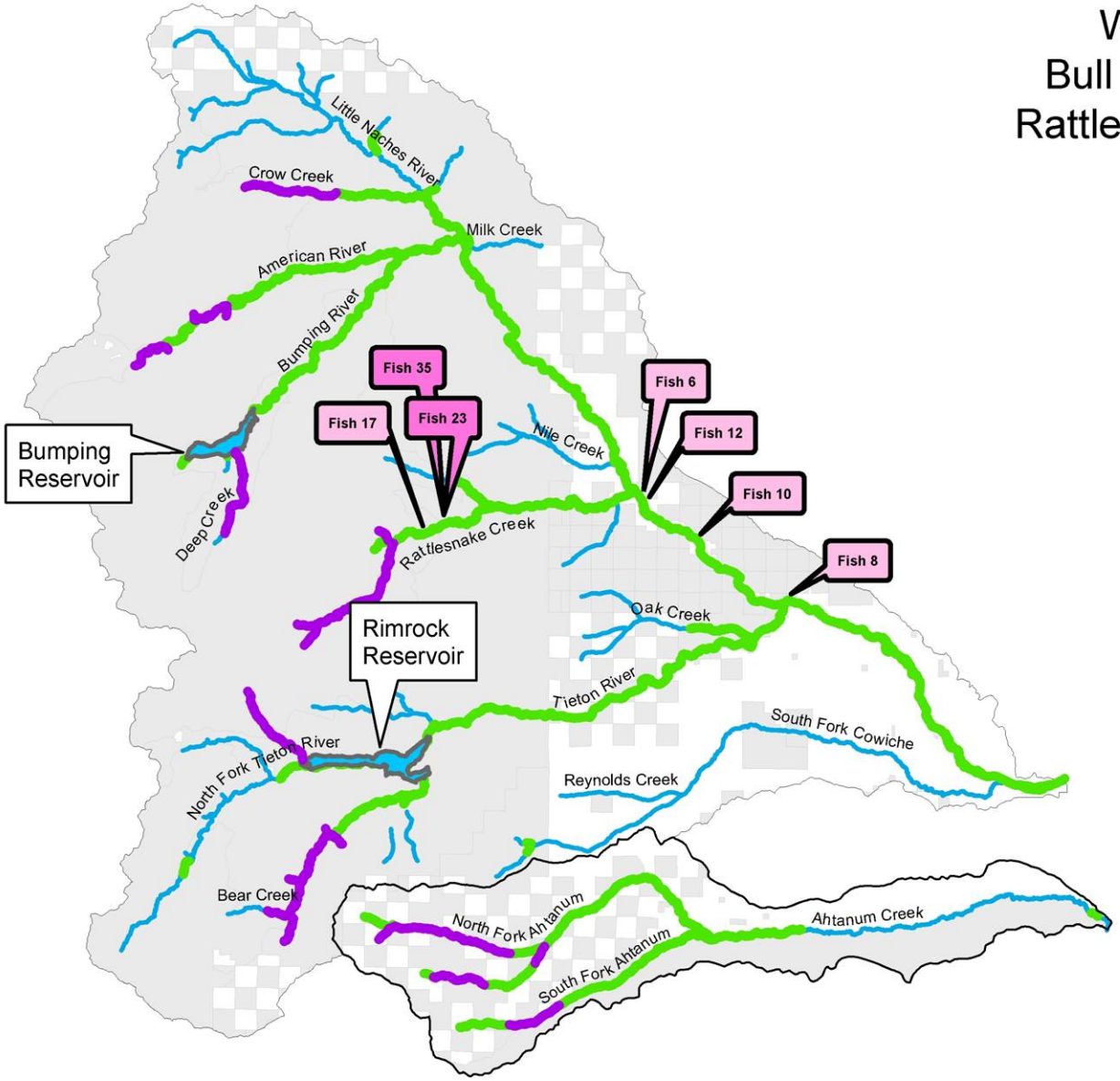
WRIA 38: Naches
Bull Trout Distribution
Rattlesnake Population

December 2003



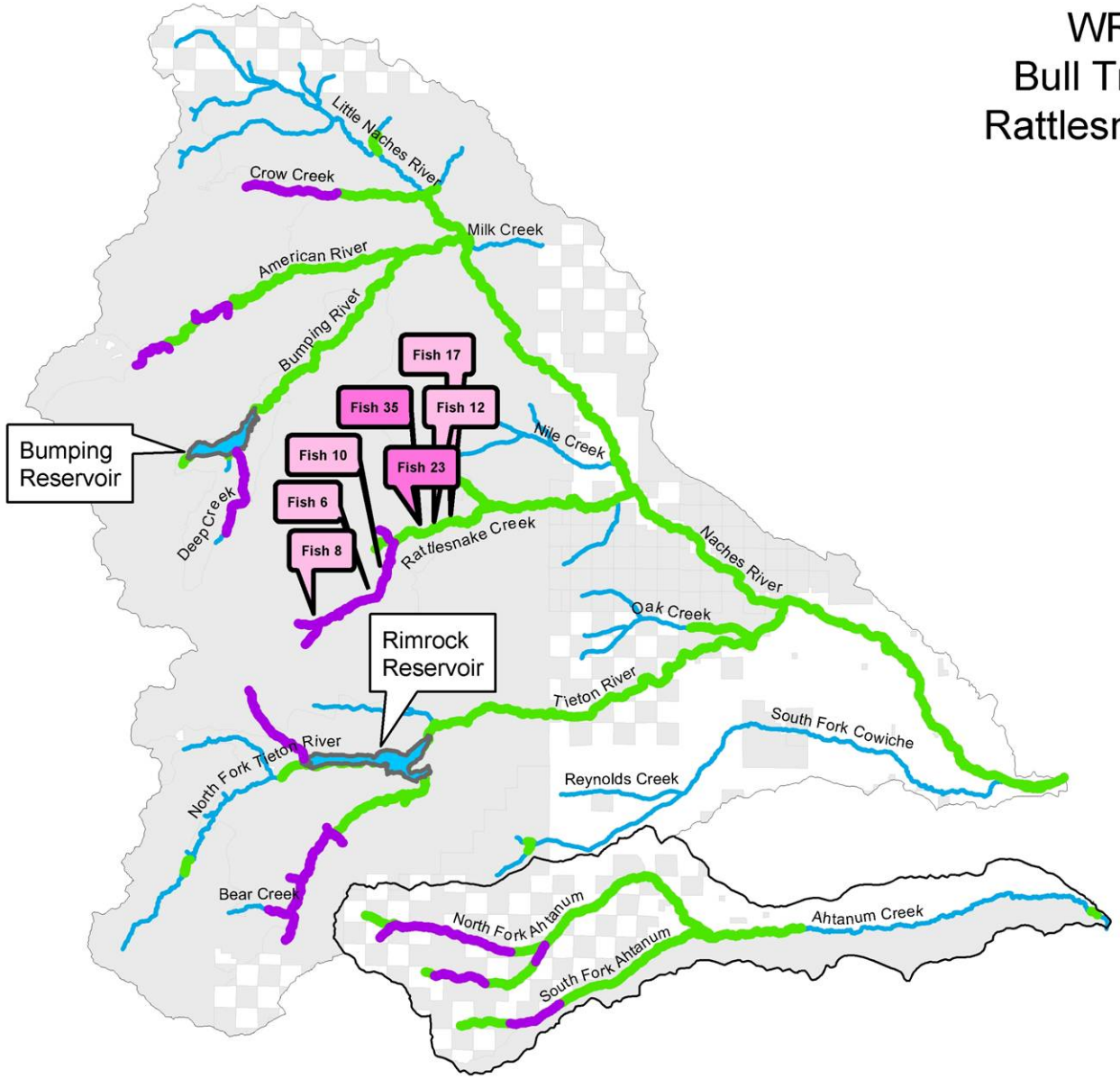
WRIA 38: Naches
Bull Trout Distribution
Rattlesnake Population

July 2004



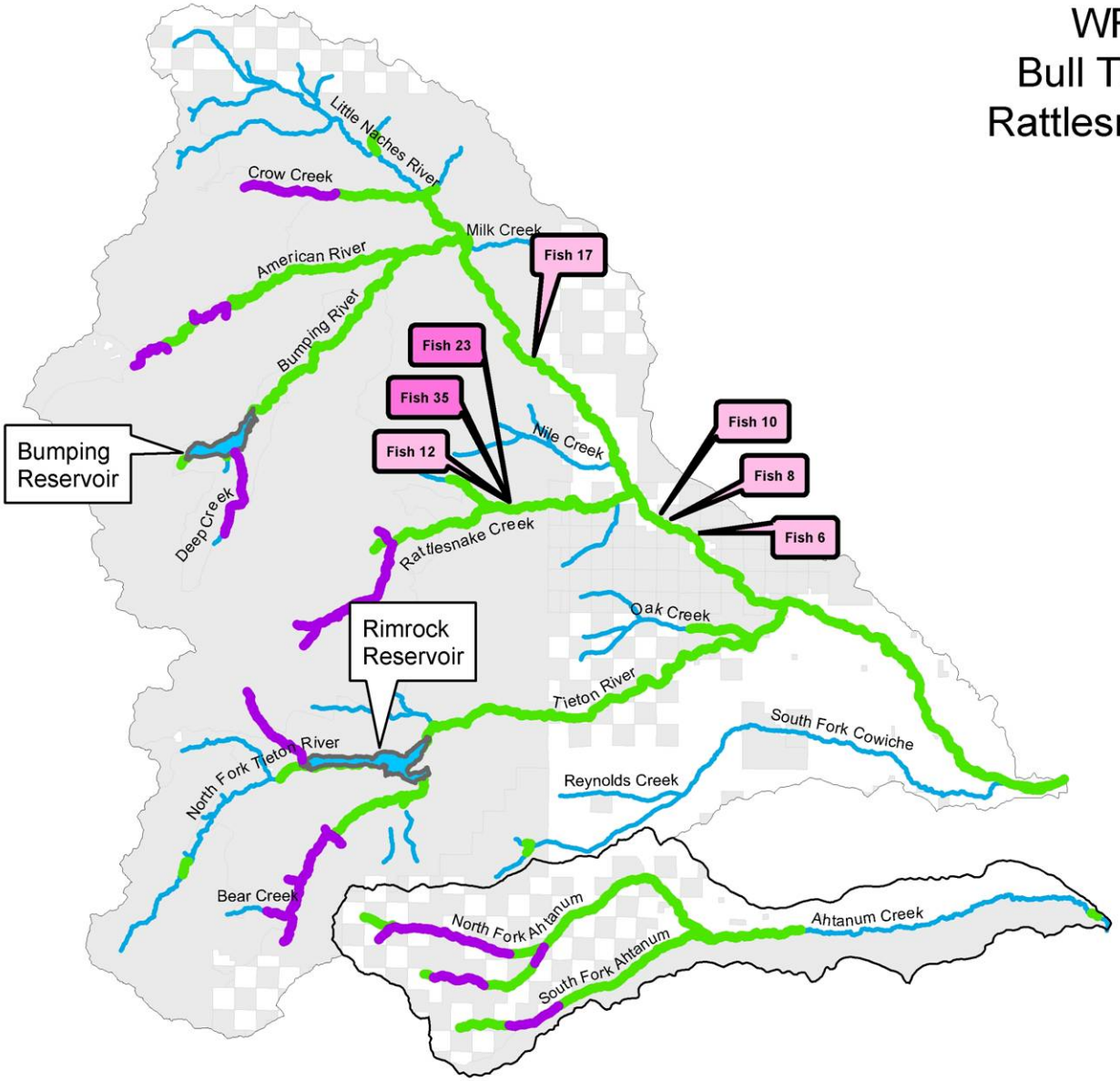
WRIA 38: Naches
Bull Trout Distribution
Rattlesnake Population

September 2004



WRIA 38: Naches
Bull Trout Distribution
Rattlesnake Population

October 2004



Sub-Adult Movements and Other Observations in the Columbia River

- Mainstem Columbia R. - Central WA Dam bull trout counts from 1998-2013
  - Wells Dam: 43-113, mean of 64
  - Rocky Reach: 77-246, mean 138
  - Rock Island: 35-121, mean 59
  - Wanapum: 0-12, mean 6
  - Priest Rapids: 1-9, mean 5

- PTAGIS – Numerous bull trout PIT tagged
  - Entiat PIT tagged subadult bull trout (243mm) moved out in 2009; In Yakima at Prosser in 2011; Back in Entiat in 2012 at spawning time
  - Walla Walla PIT tagged subadult bull trout (272mm) located in Priest Rapids Ladder in Early July of 2009

- Columbia R observations:1941 at Bonneville Dam, and others (USFWS, Borrows et al 2016, references observations)

In Summary….
……Connectivity is Key!

Connectivity is one of the most vulnerable aspects of bull trout because of their need for

- **Genetic diversity**
- **Access to Clean, Cold, Complex spawning and rearing areas**
- **Connections to Forage, Migration, Overwintering (FMO) habitat**

Recovery Planning:

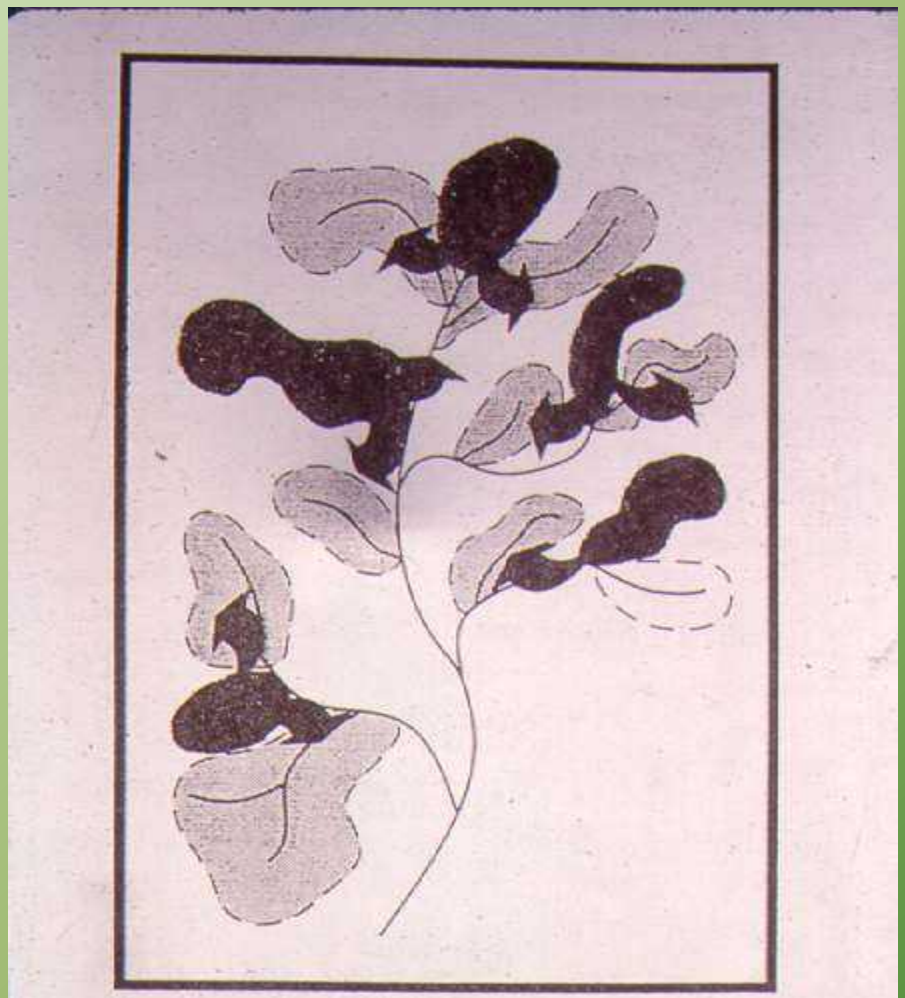
With Bull Trout highly needing connectivity and being vulnerable to changes in habitat and population degradation….What do we do?

Bull Trout Listing/Recovery History

- **1994**: **Warranted but Precluded** –1Distinct Population Segment (DPS) within the coterminous United States
- **1998/1999 Listing DPS's** - Multiple DPS's identified; Relists bull trout as 1 DPS throughout the coterminous United States; Designate old DPSs as Interim Recovery Units. (i.e., Columbia, Klamath, Jarbidge and adding the St. Mary River and Coastal Puget Sound,
- **2002/2004**: **Draft Recovery Plans Prepared** - 27 draft recovery plans prepared for the Klamath River, Columbia River, and Saint Mary-Belly Interim Recovery Units in 2002; and Jarbidge and Coastal-Puget Sound Recovery Units in 2004.
- **2004-2010**: **Designated Critical Habitat** - Critical habitat units and subunits designated in 2010 with both occupied /unoccupied habitat; and identified 6 "potential" new recovery units
- **2008 & 2016**: **5-Year Status Review** - Published 5-Year Reviews and determines bull trout listing still warrants threatened status across the range.

- **2015 New Final Recovery Plan Released - Published a Final Recovery Plan in September, incorporating 6 RUs, new information, and RU Implementation Plans (17 years post-listing).**

Metapopulation dynamics

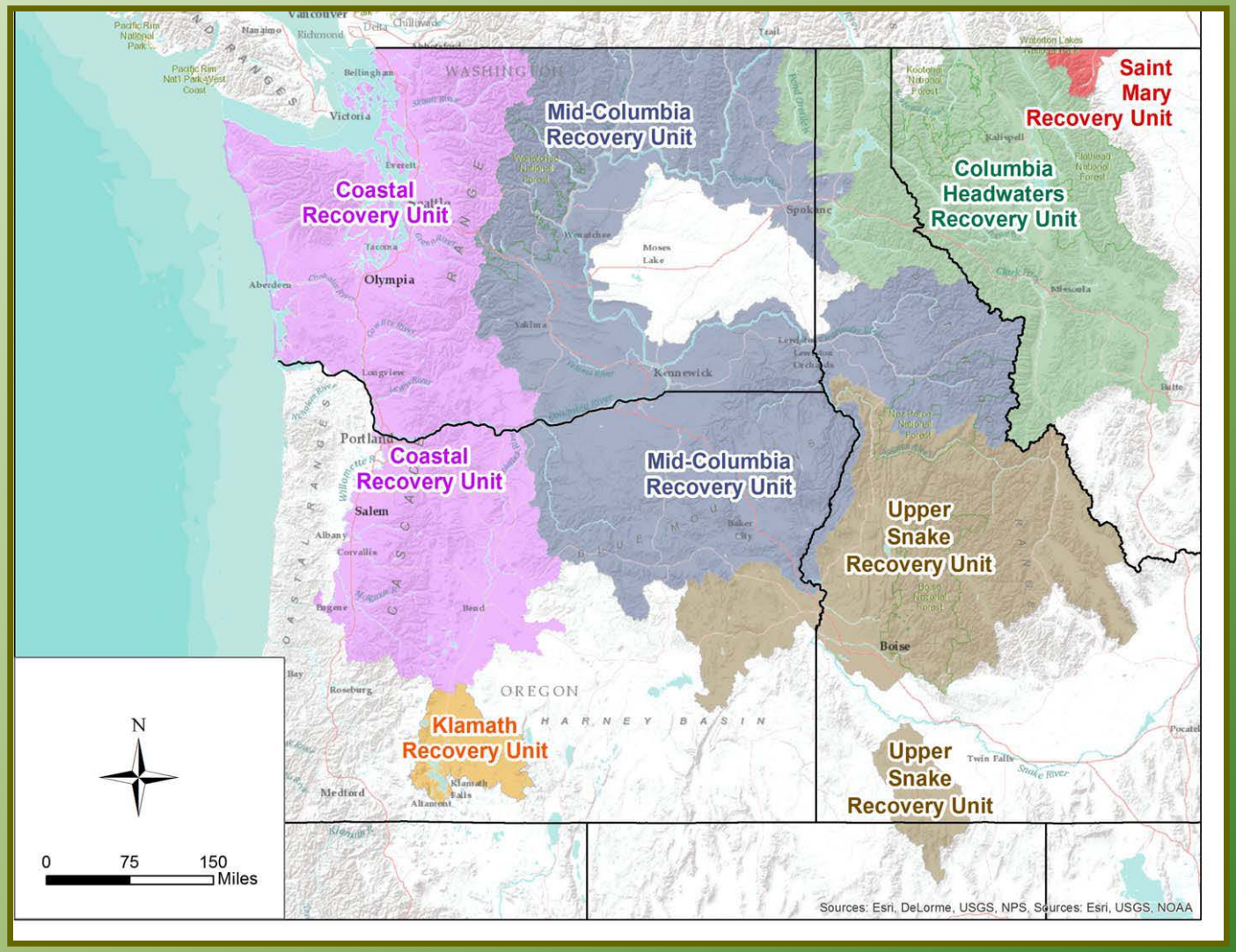


Schematic of a metapopulation

Dark shading represents higher quality habitat and stronger populations that provide dispersing individual bull trout. Light shading represents lower quality habitat that still supports populations but little dispersal to other populations.

From Rieman and McIntyre 1993

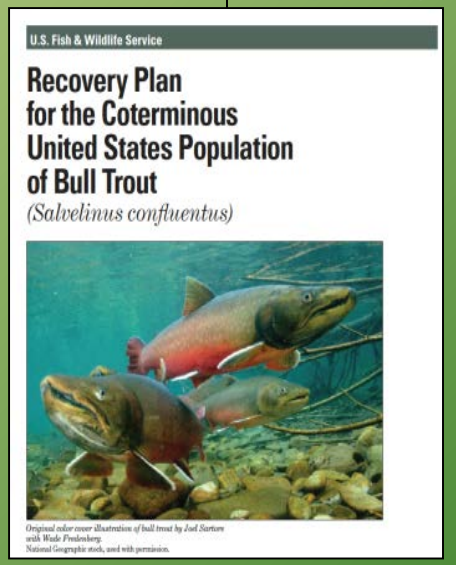
ESA Listing: 1 Distinct Population Segment with 6 Recovery Units



Wide Distribution but generally very low numbers in most populations

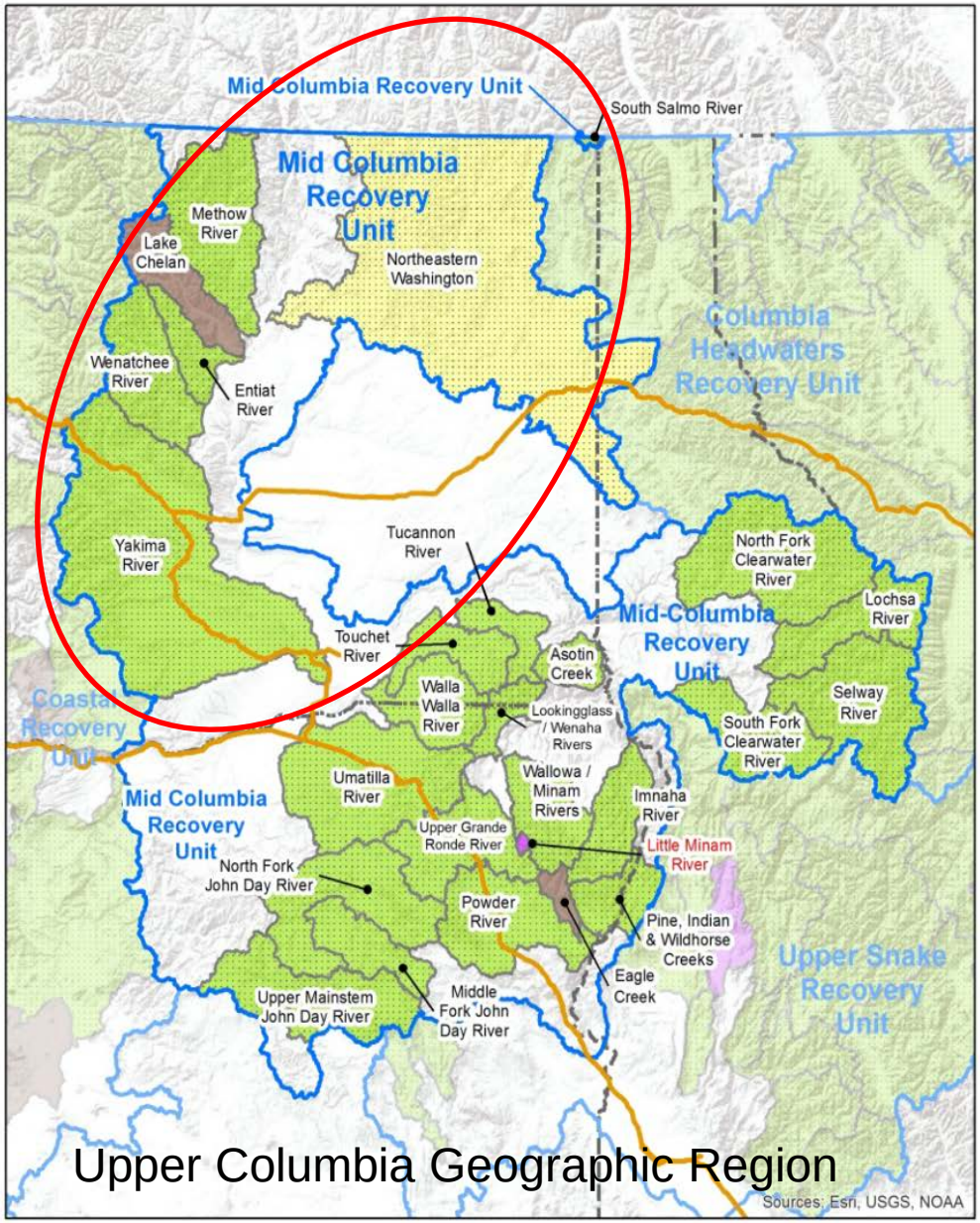
Recovery Implementation Scales

- **USFWS Recovery Plan**
  - "Broad-Scale"
  - Listed Entity with 6 New Recovery Units(RU)
  - Rangewide Criteria and Threats



- **Recovery Unit Implementation Plan (RUIP)**
  - "Mid-Scale"
  - General Core Area Information
  - Threats Assessments
  - Recovery Measure Narrative, and Actions,
  - Implementation Schedule

Mid-Columbia Recovery Unit



Upper Columbia Geographic Region

Core Areas
Asotin Creek
Entiat River
Imnaha River
Little Minam River
Lochsa River
Lookingglass / Wenaha Rivers
Methow River
Middle Fork John Day River
North Fork Clearwater River
North Fork John Day River
Pine, Indian & Wildhorse Creeks
Powder River
Selway River
South Fork Clearwater River
South Salmo River
Touchet River
Tucannon River
Umatilla River
Upper Grande Ronde River
Upper Mainstem John Day River
Walla Walla River
Wallowa / Minam Rivers
Wenatchee River
Yakima River

Historic Core Areas
Eagle Creek
Lake Chelan

Research Needs Area
Northeastern Washington

Legend

Core Areas
Complex
Simple
Historic
Research Needs Area

Recovery Units
States
Major Roads

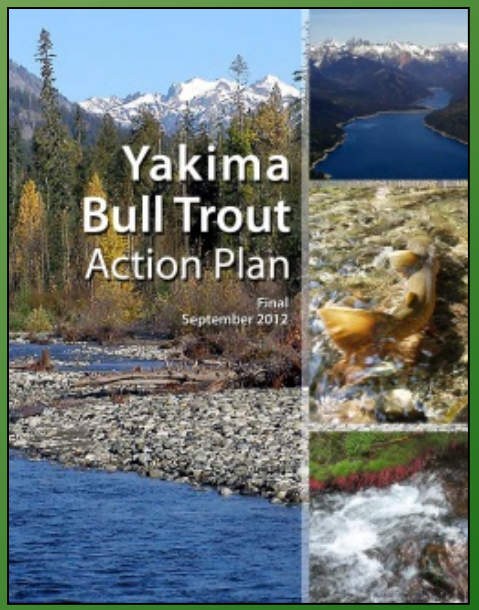
N

0 25 50 100 Miles

24 Core Areas
142 Local Pops

Recovery Implementation Scales (Continued)

- **Yakima Basin Bull Trout Action Plan**
  - **Smaller "Core Area Scale"**
  - **Yakima Basin Fish and Wildlife Recovery Board recovery actions**
  - **USFWS 5-year Action Plan**
  - **Local Threat Analysis, Actions, and Priorities**
  - **Local Science**
  - **Easy Updates**



- Scales can mesh with Council's F&W Program

Recovery Strategy

Overall Goal:

Manage threats and ensure sufficient distribution and abundance to improve the status of bull trout throughout their extant range

When this is achieved, we expect that:

- ✓ **Bull trout will be geographically widespread across representative habitats and demographically stable**;**
- ✓ **The genetic diversity and diverse life history forms of bull trout will be conserved; and**
- ✓ **Cold water habitats essential to bull trout will be conserved and connected.**

** *Demographically stable implies that populations, at the Local Population, Core Area, or Recovery Unit scale, interact with their surrounding environment so that their population status is stable or increasing based on various population metrics (e.g., size, density, age structure)*

Recovery Criteria: Threats Based

Effective Management Involves*:*

- ✓ **For the Coastal, Mid-Columbia, Upper Snake, and Columbia Headwaters RUs:**
  - Primary **threats effectively managed** in at least 75 percent of all **core areas** and **local pops**

- ✓ **In FMO habitat outside core areas:**
  - **Connectivity and habitat in shared FMO** areas should be **maintained** in a condition sufficient **for regular bull trout use and successful dispersal** among the connecting core areas

*FMO = Forarge, Migration, Overwintering habitat

RUIP – Threats Table

Pg.C-18

Geographic Region Core Area (Complex) *Core Area (Simple)*	Number of Local Populations	PRIMARY THREATS[1]		
		Habitat	*Demographic*	*Nonnative*
		roads and railroads impact both spawning and rearing and FMO habitats. Recreation. Legacy and new recreational developments impact spawning and rearing habitat (*i.e.*, rock dam building, reduced riparian areas, and compacted stream banks) and reduce habitat complexity. **Instream Impacts** (1.2) Agriculture/Forest Management Practices/Grazing/Development/ Transportation Networks. Legacy and current management actions have degraded habitat and impacted stream channels, altered fish passage, reduced water flows, and constricted floodplains. Legacy timber, fire, recreation, and grazing management have added impacts to sediments, reduced riparian areas, stream temperatures. Current grazing management plans need to be maintained and improved in spawning areas and FMO areas. Highways, railroads, county roads along FMO development reduce complexity, create passage issues, and degrade water quality. Dewatering and Altered Flows. There are reaches of stream in FMO and spawning and rearing areas that naturally dewater and	Management and Transportation systems have impeded passage and have reduced habitat complexity. Dewatering. Stream reaches naturally dewater during times of low snowpack/rain and maybe further impacted with climate change. Entrainment (hydropower and diversions)/Fish Passage/Altered Flows. Entrainment and altered flows occur at all hydropower dams on the Columbia River and at other diversions/dams in the Wenatchee core area where fish passage is impeded. Some passage barriers alter timing and migration from spawning/rearing to migration areas. Altered flows and climate change have or will have caused reduced or limited use of some migratory corridors. Climate Change. Climate change is predicted to impact stream flows and temperatures that will cause barriers for passage and reduced refuge. **Fisheries Management** (2.2) Angling/Harvest/Poaching. Fishing regulations and harvest rules have improved but need to continue protect bull trout. Illegal poaching occurring in several basins. Introduced Species. Brook trout overlap with bull trout in both spawning and rearing and FMO habitat.	identified brook x bull trout hybrids within the basin. Salmon recovery involves output of high numbers of smolts, with some residualization and species competition which may have impacts to preybase and small populations of bull trout. Climate Change. Predatory non-native species occur within FMO habitats and risk potential spread esp. as waters warm with climate change.

RUIP - Recovery Action Narrative

Mid-Columbia RUIP
Pg. C-101

Yakima River Core Area

1. Actions to Address Habitat Threats

1.1. Upland/Riparian Land Management

Agriculture Practices

1.1.1. Maintain, restore, and protect riparian areas. Work with landowners, conservation districts, State, etc. to develop good management practices for riparian areas adjacent to spawning, rearing and forage/migration/overwintering habitats (*i.e.*, Ahtanum Creek, Teanaway, Yakima, and Naches Rivers).

Forest Management Practices

1.1.2 Maintain, restore, and protect riparian zones and stream channels associated with bull trout habitat. Along with ongoing implementation of the NW Forest Plan and implementation of the Forest Aquatic HCP on DNR lands implement specific forest practices and special use permits to protect and restore bull trout. Implement the Okanogan-Wenatchee Forest Restoration Strategy to protect and improve riparian reserves and stream channels as part of management planning. Develop, monitor, and adjust new Okanogan-Wenatchee National Forest Plan to incorporate at least these strategies and goals to insure protection of floodplains, riparian areas, and stream channels to maintain and restore bull trout habitat. As well, focus on land/water acquisitions that assist in improving riparian and instream habitats.

Livestock Grazing

1.1.3 Reduce grazing impacts. Fencing, changes in timing, and the use of riparian pastures, off site watering and salting, and other measures can be used to minimize grazing impacts. Evaluate ongoing allotment management for effects to bull trout and bull trout critical habitat. Modify management as needed, to reduce or eliminate effects that would retard recovery of bull trout populations and/or bull trout designated critical habitat. Conduct implementation and effectiveness monitoring, using accepted interagency monitoring protocols currently. Apply monitoring

RUIP - Recovery Measures

Core Area	Threat Factor	Recovery Action Priority	Recovery Action Number	Recovery Action Description	Recovery Action Duration	Responsible Parties	Comments	Estimated Costs (x $1,000)					
								Total Cost	FY 16	FY 17	FY 18	FY 19	FY 20
Yakima	A	2	1.1.3	Reduce grazing impacts.	O	USFS, WDNR, Counties, Cons Dist		1,000					
Yakima	A	2	1.1.4	Reduce impacts to riparian areas and stream banks.	O	WDFW, DOE, USCOE, Counties, Cities, Cons Dist,	Combined with salmon recovery	10,000					
Yakima	A	1	1.1.5	Reduce habitat and floodplain impacts.	O	WSDOT, Fed Hwys, Counties	Combined w/ salmon recovery	10,000					
Yakima	A	2	1.1.6	Reduce impacts from recreation to riparian areas.	C	USFS, WDNR, WDFW, Parks and Rec, Pvt Rec Groups, BT Task Force		5,000					
Yakima	A	2	1.2.1	Protect and improve riparian areas and floodplains.	O	WDFW, NRCS, Cons Dist, Counties	Combined with salmon recovery	10,000					
Yakima	A	2	1.2.2	Implement stream restoration in degraded stream reaches.	O	USFS, WDNR, PTC, Yakama, BOR		15,000					
Yakima	A	3	1.2.3	Reduce cumulative impacts in FMO to populations that are impacted during natural dewatering of spawning and rearing areas.	C	BOR, USFS, WSDOT, Ahtanum Irrig Dist, WDNR		*					
Yakima	A	2	1.2.4	Reduce impacts to riparian areas in spawning reaches.	O	USFS, WDNR, Cons Dist, NRCS,		1,000					
Yakima	A	1	1.2.5	Develop adequate passage to connect FMO to spawning and rearing areas.	5-20	BOR, WDFW, Yakama, USFWS, NOAA, BPA		166,000					
Yakima	A	1	1.2.6	Connect FMO and spawning and rearing habitat.	5-20	BOR, WDFW, Yakama, USFWS, NOAA, BPA	See 1.2.5	TBD					

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Local Scale Example: Yakima Action Plan

Gold Action #2: Implement Lower Gold Floodplain Restoration Plan

Action Type: Recovery

Life stage(s) affected: Spawning/egg incubation, Pre/post spawning migrations, Juvenile Rearing

Threat addressed: Dewatering

Severity: Significant

Associated RUIP Actions: 1.15, 1.21, 1.22, 1.24

Link to Threats Table: G1,G2,G3,G4,G10,G11,G12,G19,G25, G26

RUIP Pg.195

Action Description

Gold Creek Floodplain Restoration (USFS) which would include the removal of legacy dikes and road fill from the gravel pit operation, relocation of ADA accessible trail away from Gold Creek, relocation of the footbridge out of floodplain, restoration of hydraulic connectivity through the parking area, installation of an engineered logjam in Gold Creek and replacement of the current Forest Service road bridge.

Justification/Background

The US Forest Service, in the process of completing a large-scale scoping NEPA document, included this project as a placeholder for restoration actions suggested by the results the a hydrological study (Gold #1).

Key Partners

USFS, USFWS, BOR, YBFWRB, KCT

Time to Implement: 3-5 years

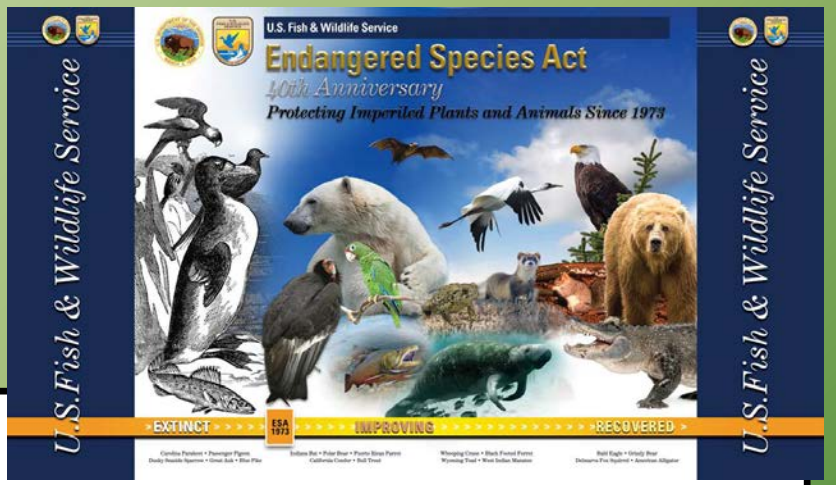
Time to Benefit: 5+ years

Cost Estimate: $1 million

Cost Derivation

Cost estimate is based on Forest Service initial estimate for project implementation.

Recovery and the ESA: More than just tools and plans….



- **Endangered Species Act (ESA) -** Provides tools for Pathways to Recovery
- **Recovery Plans -** Establish the necessary structure and guidance that move a species towards **Survival and Recovery**
- **Section 4, 6, 7, 8, 9, and 10 ⟺ Recovery Actions**
- **ESA Tools... not just permits... They are agreements that involve ongoing coordination for conservation planning**

ESA Recovery Implementation Tools

Other Sections of ESA provide tools to promote Survival and Recovery

- **Section 4 –** Recovery Planning and Protective Regulations - 4dRule with WDFW and Tribes for direct and incidental catch for fishing
- **Section 6** – Cooperation & Agreements between USFWS and States to implement recovery actions and manage Incidental take in their ongoing work
- **Section 7** - Federal Consultation
- **Section 8** – International Cooperation (i.e., Core areas in USA)
- **Section 9** – Prohibited Acts such as "take" (Illegal to harass, harm, pursue, hunt/fish, wound, kill, trap, capture, or collect)
- **Section 10** – Exceptions for Recovery Permits for partners (i.e., handling and HCPs)… Projects that involve a partner's plan for doing good science & conservation for bull trout.

ESA & Section 7 for Federal Agencies

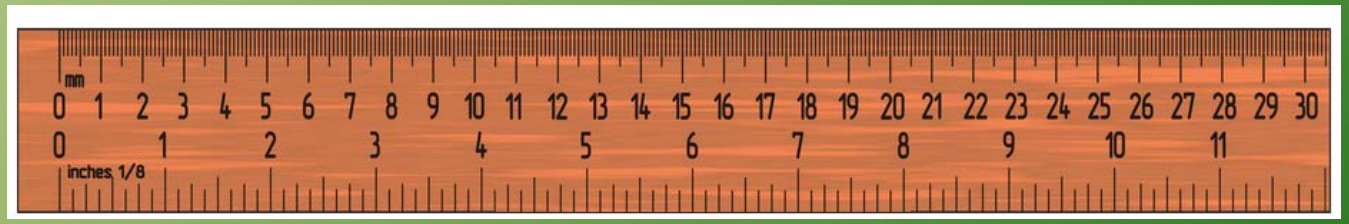
Section 7 Consultation: Federal Agencies held to higher bar ….they have the largest amount of habitat

- **Section 7(a)(1) - Federal agencies utilize their authorities to carry out conservation programs for Listed species and Critical Habitat**
  - Use your affirmative obligations to implement Recovery Actions (e.g., USFS - Deep Creek)
  - Actions implemented with regard to conservation and recovery

- **Section 7(a)(2) - Federal agencies in consultation must insure that actions authorized, funded, or carried out are not likely to jeopardize (species) or cause adverse modification (critical habitat).**
  - Management Actions undergo consultation; Letter of Concurrence or Biological Opinion and its jeopardy analysis determines outcome
  - Maintain or improve populations and habitat with conservation measures and recommendations
  - Projects can be recovery actions or include recovery actions

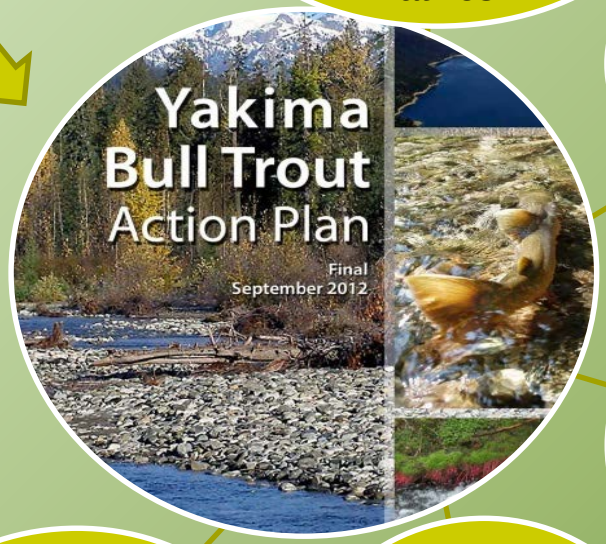
How will recovery be measured?

- Assessment Workshop Process
- Threats Assessment Tools
  - i.e., Appendix E of Recovery Plan, BT Matrix, Habitat Information (reach and watershed assessments), Population Information
- 5-yr Status Updates (i.e. 2008 and 2016)
- Evaluation of Recovery Unit Status (i.e., 5 listing factor analysis)



Implementation Planning Examples

Bull Trout Recovery Work Groups



Population Restoration Actions- Fish Salvage, Re-introductions, non-natives

Land/Water Management– Forest Plans, Dams, Agriculture

Habitat Restoration Actions– Restoring complexity and Connecting habitats

Monitoring- Redd surveys, Genetics, etc.

Baseline Studies– Reservoir Food webs, Migration patterns,

Water Management: Dam Operations - BOR/COE/BPA

Land Management: USFS/DNR/WDFW/ Tribes

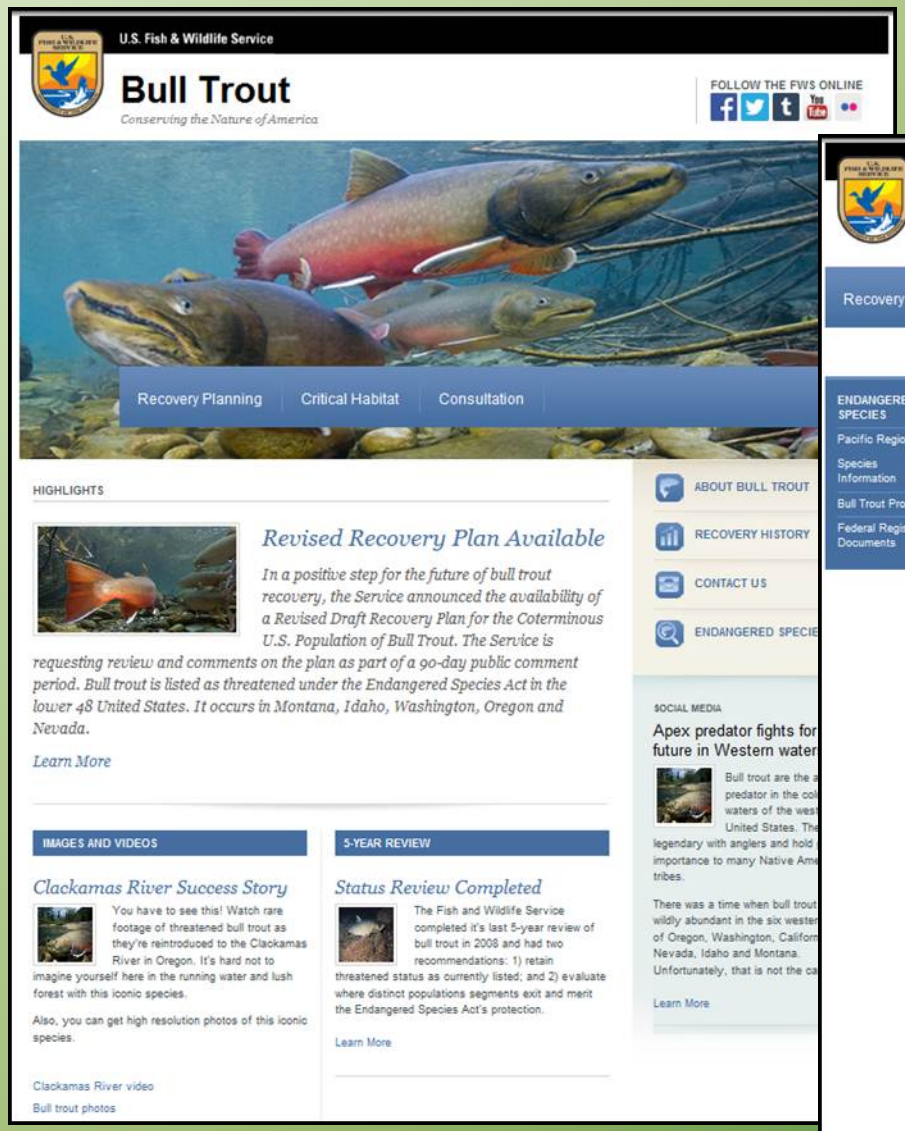
Fish Management: State/USFWS/NOAA/ Tribes

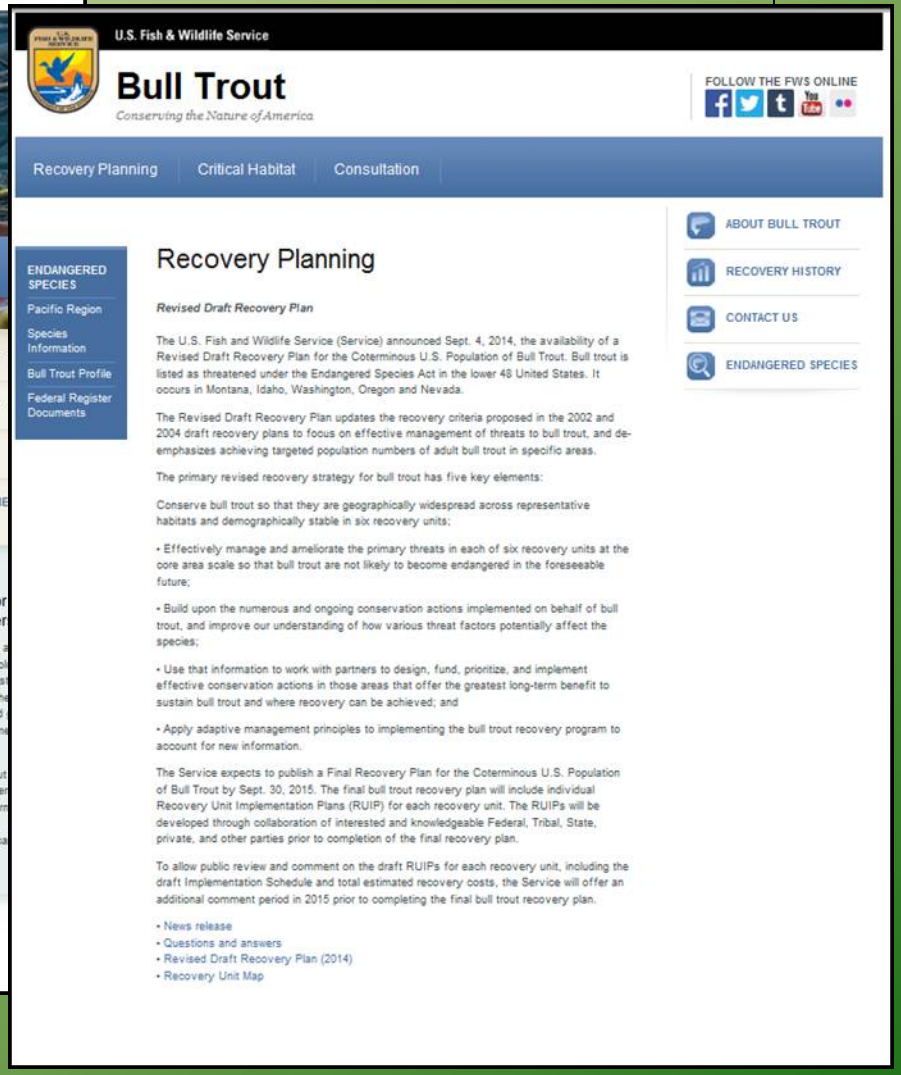
Scientific Studies: CWU, UofW, USGS, USFWS, USFS, DOE TFW, WDFW, BPA, etc..

Brainstorming: Columbia R. Water Operations

- Link Fish and Wildlife Program with Recovery Plan
  - Mainstem Columbia = Migratory Corridor, FMO and CHU
  - Subbasins = Core areas, Spawning and rearing, and single or grouped CHUs
- Baseline Information - Habitat and Population Indicators – USFWS BT Critical Habitat PCEs and Matrix of Pathways and Indicators
- What about a Mainstem Action Plan?
  - BT Work Group
  - Could be Similar to Yakima Action Plan - A place to house the data, update, develop actions linked to populations…
  - Threats and severity, identify data gaps and habitat information, monitoring needs, actions, prioritize?….
- Biological Opinions

http://www.fws.gov/pacific/bulltrout/

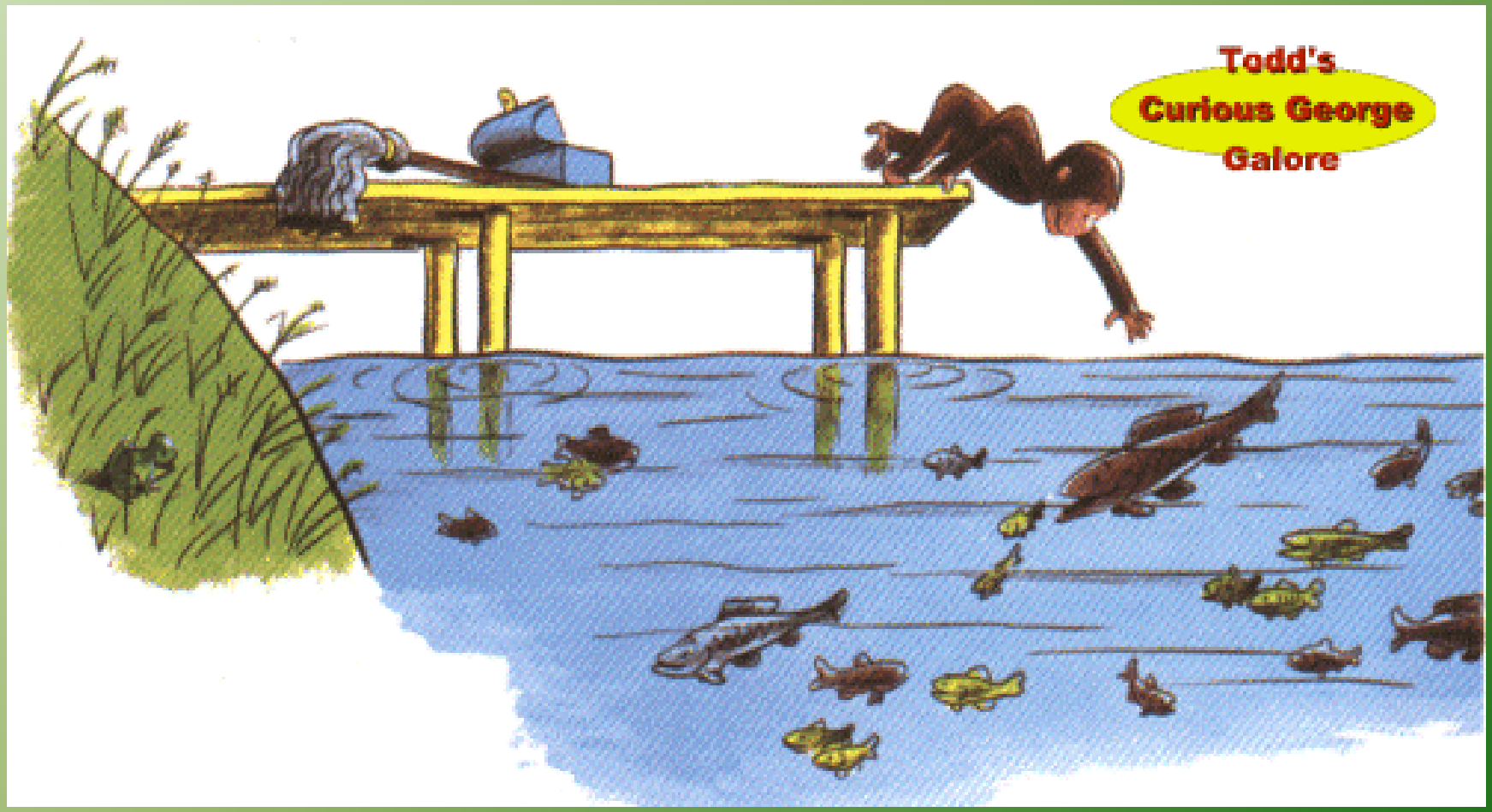




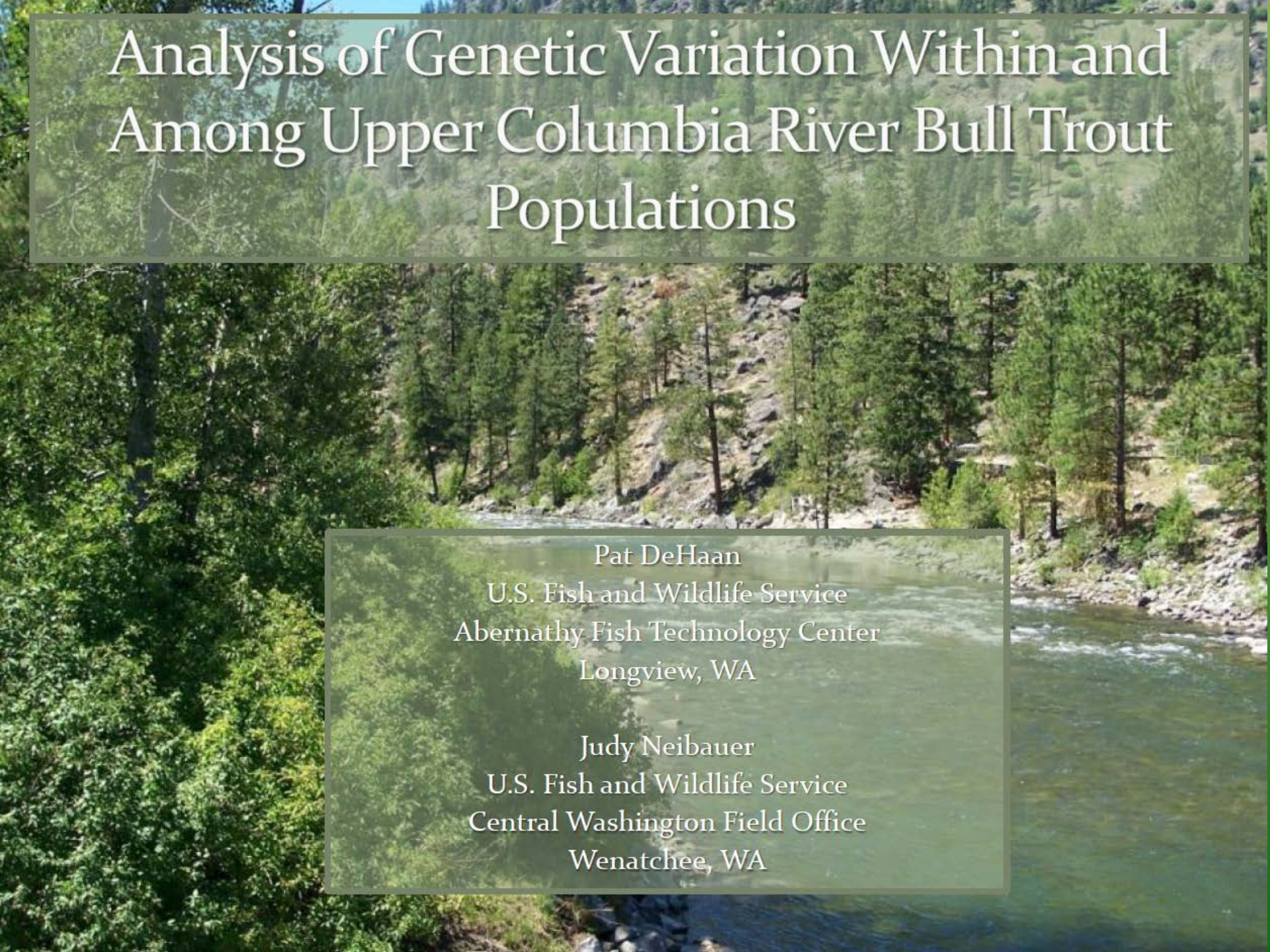
What's Next? Will we find anadromous bull trout up here?

Extra Slides

The *Salvelinus confluentus* Curiosity Society: 1988-2016



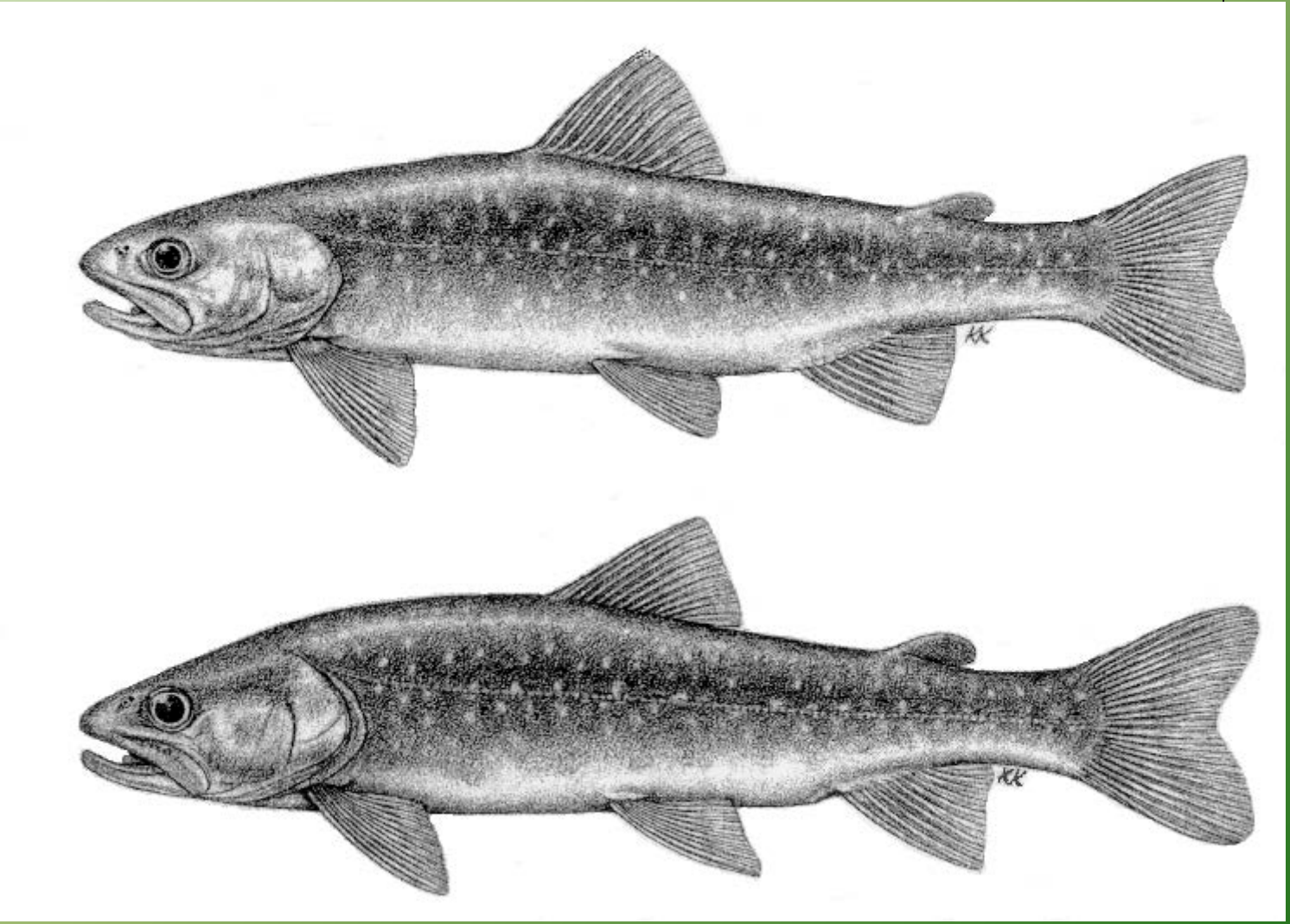
Analysis of Genetic Variation Within and Among Upper Columbia River Bull Trout Populations



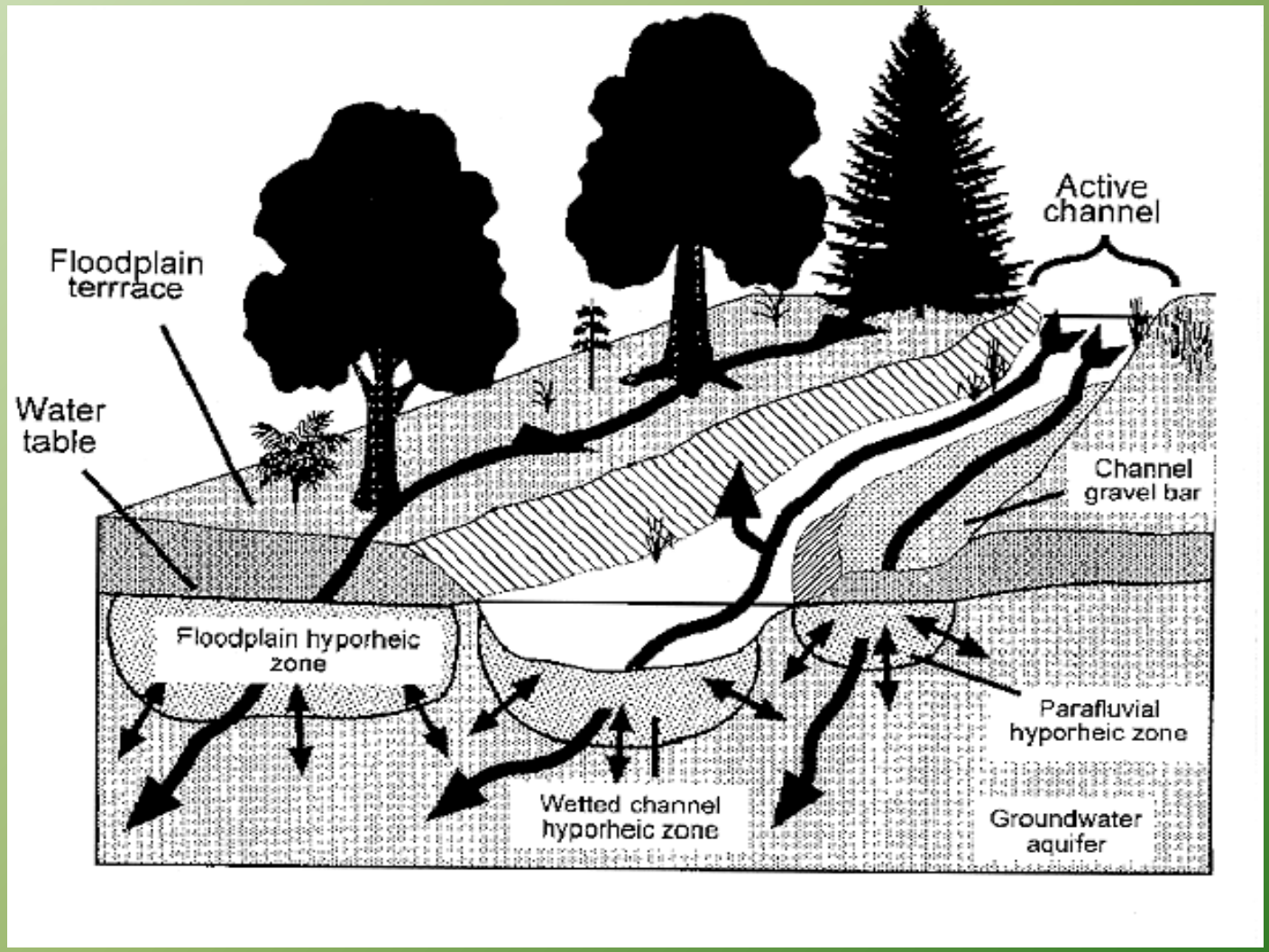
Pat DeHaan
U.S. Fish and Wildlife Service
Abernathy Fish Technology Center
Longview, WA

Judy Neibauer
U.S. Fish and Wildlife Service
Central Washington Field Office
Wenatchee, WA

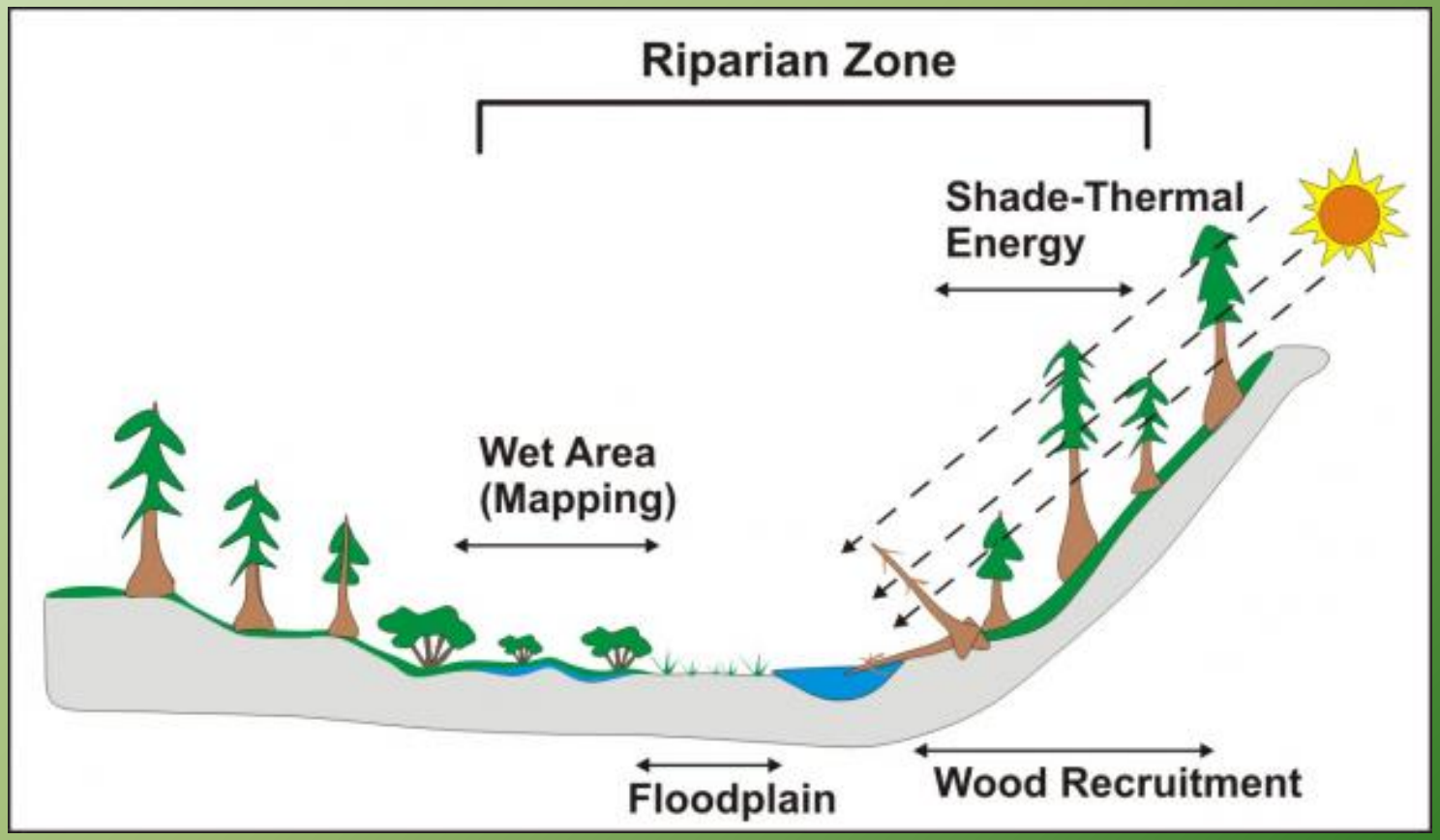
Bull Trout and Dolly Varden Are Different Species



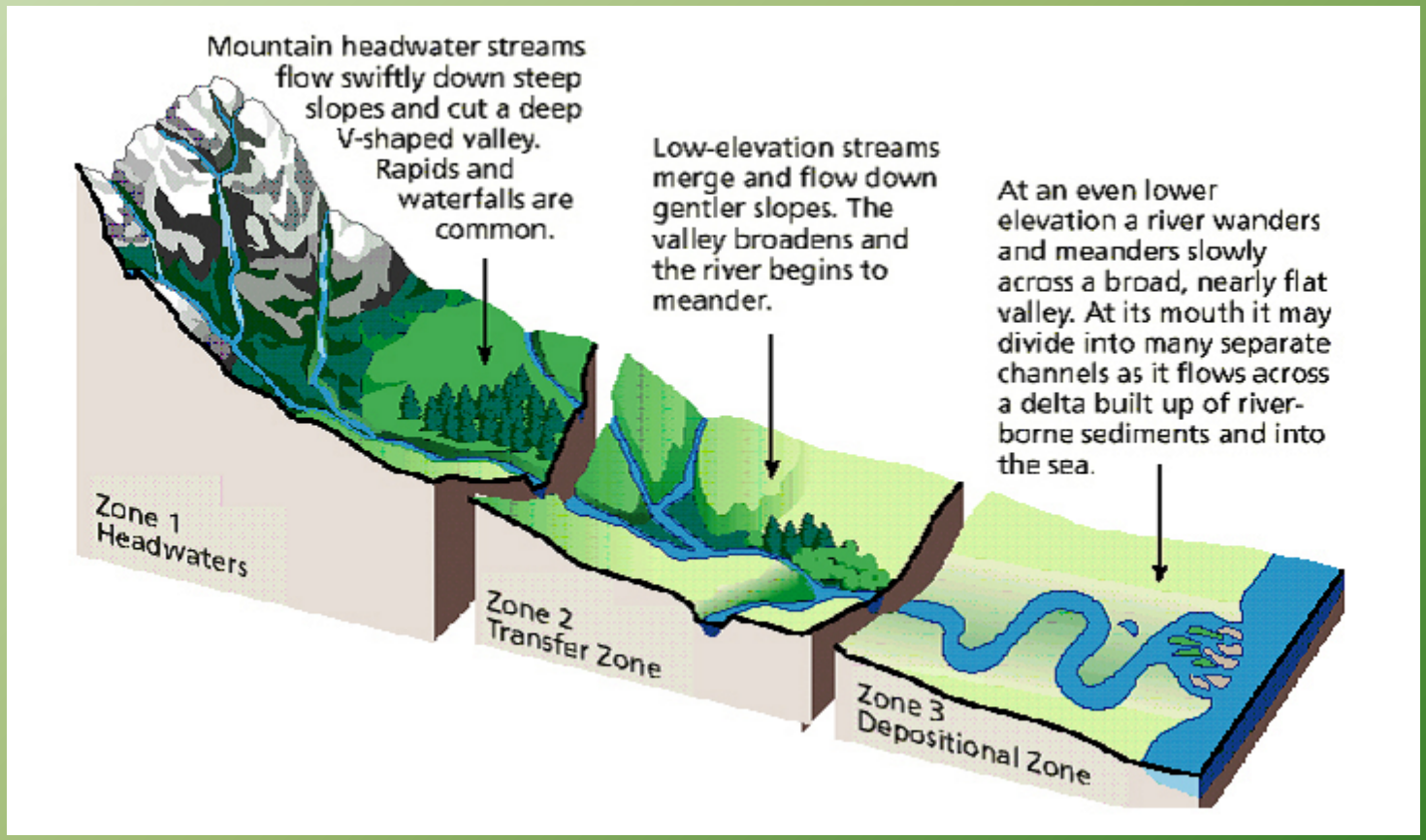
Cold and Clean Water: Protect Hyporheic Zones



Clean and Complex Habitat: Protect and Improve Riparian Areas



Connected Habitat: Improve and maintain connectivity and complexity within a Bull Trout watershed



Lake Chelan gone?

The New York Times

RARE SPORT ON THE CLIFFS

GOOD WIND, FIRM MUSCLES, AND A QUICK EYE REQUISITES TO SUCCESS —A LAND WHERE DEER AND BEAR ABOUND—BIG TROUT IN THE LAKE —WHAT THE COUNTRY IS LIKE.

I saw seven goats killed, two of which fell into cañons. The men began to skin the animals, and realized that the hunt was over. So I resumed fly casting, and after I had caught the precise number of fish I wanted—large bull trout all—I slowly rowed across the smooth water to camp and began to prepare for supper.

kids. The saddle of one of the latter had been packed in, and that night we had kid steaks and two four-pound bull trout for supper.

Published: December 25, 1892

PIT TAGS: Walla Walla BT use Mainstem Columbia River too, Anglin et al 2009, USFWS

Table 6. Tagging and detection history details for PIT tagged bull trout detected at mainstem Columbia River dams in 2009.

Bull Trout # (length)	Date Tagged (*) / Detected	Elapsed Time (days)	Location Tagged (*) / Detected
Bull trout 1	07-30-08*	N/A	Little Walla Walla Diversion (rkm 76)*
(249 mm)	12-06-08	129	Nursery Bridge (rkm 74)
	12-22-08	16	Burlingame Diversion (rkm 60)
	12-23-08	1	Burlingame Diversion (rkm 60)
	04-15-09	113	McNary Dam Juvenile Bypass (rkm 470)
Bull trout 2	10-23-08*	N/A	Nursery Bridge (rkm 74)*
(269 mm)	11-08-08	16	Nursery Bridge (rkm 74)
	11-09-08	1	Nursery Bridge (rkm 74)
	11-14-08	5	Burlingame Diversion (rkm 60)
	12-28-08	44	Burlingame Diversion (rkm 60)
(recaptured at 298 mm)	02-11-09	45	Pierce's RV Park (rkm 9)
	05-25-09	103	McNary Dam Adult Ladder (rkm 470)
	06-19-09	25	McNary Dam Adult Ladder (rkm 470)
	06-20-09	1	McNary Dam Adult Ladder (rkm 470)
Bull trout 3	01-28-09*	N/A	Pierce's RV Park (rkm 9)*
(272 mm)	07-05-09	158	Priest Rapids Dam Adult Ladder (rkm 639)

Upstream of the Yakima R

Mainstem Columbia River

2016 USFWS Report

Mainstem Columbia bull trout synthesis, Borrows et al 2016

Table 1.2. Historical bull trout presence within the mainstem Columbia River in Bonneville Pool, at Bonneville Dam, and downstream from Bonneville Dam (Source: Gray 2007).

Observation Date	Observation Location	Observation Source	Sampling Method	Observation Details
3 May 2006	Drano Lake	WDFW bull trout project	Small mesh gill net	Adfluvial, 303 mm
21 March 2005	Bonneville Dam	Dean Ballinger, PSMFC	Smolt bypass facility	Adult, 390 mm
14 April 2005	Columbia River East of Drano Lake 0.4-0.8 km	ODFW Northern Pikeminnow Crew, Tom Freisen and Jim Koloszar	Electrofishing	Bull trout (eventually determined to be Arctic char)
23 May 2005	mouth of Hamilton Cr below Bonneville Dam	Below Bonneville Chinook Evaluations, Ricky Heitz, PSMFC	Seine	Adult bull trout, 330 mm
20 June 2005	Near Cascade Locks	Northern Pikeminnow fisher	Observation	Slender salmonid appears to be bull trout
August 2005	Mainstem Columbia River, below Bonneville Dam, lower end of Hamilton Island	Recreational fisher, Don Howard	Angling	Bull trout, approx. 381 mm
May 2000	Mouth of the Klickitat River	Pikeminnow sport-reward fishermen	Angling	Bull trout/Dolly Varden
May 2000	Mouth of Klickitat River	Pikeminnow Sport Fishery	Angling	Bull trout, no size
April 2000	Drano Lake	Recreational fisher	Angling	Floy tagged bull trout from Hood River, harvested
1998	Mouth of Klickitat River	Tribal fishermen	Tribal Gillnetting	2 bull trout, size undocumented
10 May 1998	Below Bonneville Dam	Northern Pikeminnow fisher	Angling	Bull trout, harvested
24 May 1998	Bonneville Reservoir	Northern Pikeminnow fisher	Angling	Bull trout, harvested
15 June 1998	Bonneville Reservoir	Northern Pikeminnow fisher	Angling	Bull trout catch-and-release
16 June 1998	Bonneville Reservoir	Northern Pikeminnow fisher	Angling	Bull trout catch-and-release
08 May 1994	Bonneville Dam, Washington ladder	??	Observation	Dolly Varden (remarks said possible dolly varden)
11 September 1986	Bonneville Dam, Bradford Island fish ladder	??	Observation	Dolley Varden
28 August 1982	Bonneville Dam ladder passage	Marv Yoshinaka, FWS	Observation	??
8 March 1947	Bonneville Dam, Bradford Island	??	Trapped	Dolley Varden, positively ID'd
3 March 1941	Bonneville Dam, Washington Ladder	??	Observation	Downstream passage of "Dolley Varden"

Why 75%?


Photo Credit: Dave Herasimtschuk

- 75% is the minimum
- Acknowledgement recovery may not be possible in all areas (due to climate change, non-natives, habitat loss, etc.)
- Need to insure Resilience, Redundancy, & Representation is met

FWS Tools: BT Matrix

Indicator	Population characteristics	Habitat: (non-watershed condition indicators)	Habitat: (watershed condition indicators)	Species and habitat
Population size and distribution	■			
Growth and survival	■			
Life history diversity and isolation	■			
Persistence and genetic integrity	■			
Temperature		■		
Suspended sediment-intergravel dissolved oxygen/turbidity		■		
Chemical contaminants/nutrients		■		
Physical barriers		■		
Substrate character and embeddedness		■		
Large woody debris		■		
Pool frequency and quality		■		
Large pools		■		
Off-channel habitat		■		
Refugia		■		
Average wetted width/maximum depth ratio in scour pools in a reach		■		
Streambank condition		■		
Floodplain connectivity		■		
Change in peak/base flows		■		
Increase in drainage network		■		
Road density and location			■	
Disturbance history			■	
Riparian Reserves			■	
Disturbance regime			■	
Summary/integration of all species and habitat indicators				■

[1] This table, a summary of Appendix A, lists indicators by category and displays the distinction between Watershed Condition Indicators (WCIs) and Non-WCIs.