

# Adult Migratory Patterns in the Upper Columbia River Bull Trout Recovery Unit

Pilot Studies in the Wenatchee and the Mainstem Columbia Rivers

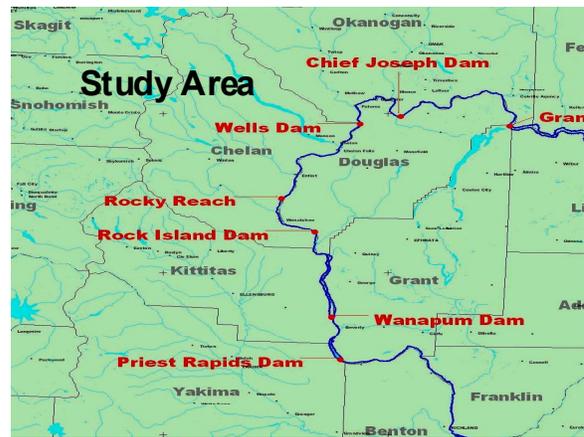
USFWS Bull Trout Workshop

October 31, 2001

Judy De La Vergne and Barb Kelly Ringel, USFWS



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## Overview

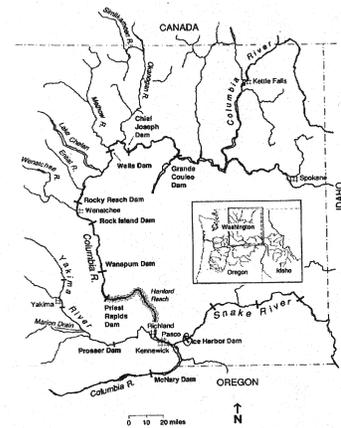


- At least three life forms of bull trout exist within the basins
- Fishery management requires the best information
- 50-over 100 adult bull trout are migrating through dams/wiers on the mainstem Columbia, Wenatchee, and Twisp Rivers

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## Columbia River Tributaries and Dams



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## Wenatchee Radio Telemetry Project

### Design



- The Wenatchee basin radio telemetry project was chosen because:
  - 1) radio telemetry is a reliable method used to determine life history patterns
  - 2) the population is larger than in the other basins
  - 3) there are multiple ways and locations to catch fish
  - 4) of the fish moving through the dams and the large, spawned out, bull trout had been seen in steelhead creel censuses in the lower Wenatchee basin

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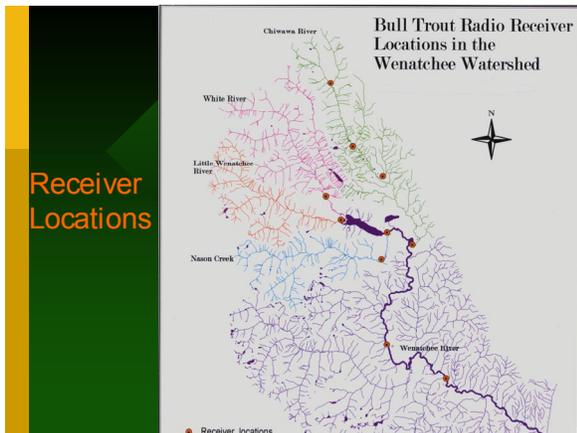
### Design con't.

- It is a two+ year study designed to observe return migrations to areas of spawning, holding/feeding, and overwintering
- This pilot project is providing quick migratory information and is identifying information gaps
- Coordination is included in development of budget, surgery techniques, anesthetic, stationary receiver sites, and aerial flights



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### Methods

#### Training

- Training for surgically implanting transmitters and external thermal tags
- Practiced surgeries on 10-15 chinook jacks and hatchery rainbow and one northern pike minnow
- In cooperation with multiple researchers we are working on a method of attachment for external tags

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### Methods Con't.

#### Tagging

- permits received
- fish tagged were at least 1.8lbs and/or 15" or 380mm
- fish were tagged in both the upper and lower basin
- fish were released within 15 minutes after surgery and transport in holding tubes
- coolers and ice were used to maintain temperatures during holding and transportation
- fish were not usually tagged when water temperatures were greater than 15 deg. C
- fin clips were taken and sent to three labs

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### Methods Con't

#### Radio Receiver Setup

- Setup ten stationary sites at major spawning tributaries
- Coordinated with USGS-BRD, USFS, WDOT, and WDFW on setup, location, and tracking responsibilities
- Lotek receivers are used for stationary data recording and mobile and aerial tracking

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### Results

#### Fish Capture/Tagging

- Average Weight and Average Length: 570mm and 3.5lbs or 1,600 grams
- Females:Males – 5:28 with 6?
- 35 fish tagged in 2000 and 10 more in 2001 with an average surgery time of 6:00 minutes
  - 16 Fish captured at Chiwawa weir in 2000
  - 14 at Lake Wenatchee, in 2000 and 4 more in 2001
  - 5 in Icicle Creek in 2000 and 4 in 2001
  - 2 total or 1 at each of Tumwater and Dryden dams
  - 3 thermal tags attached (1 in 2000 and 2 in 2001) with in an additional 3.4 minutes of surgery time

#### Anesthetic

- the addition of ms222 caused two points change in pH
- Buffered with sodium bicarbonate
- Recovery time averaged 1 minutes

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### Results Con't

#### Fish Movement

- All fish moved after release, except two in the lake
- Migration occurred between between Lake Wenatchee and the Chiwawa R. both before and after spawning
- Migration occurred by Lake Wenatchee fish into all the sub-basins by 2001
- Fish that went into the White R. in 2000 went into the Chiwawa R. in 2001 and visa versa
- Migration of Icicle R fish was downstream to lower Icicle Cr and Wentchee confluence, during summer chinook spawning, in 2000, and they are holding in the Icicle 2001
- Migration down to the Columbia R. occurred in 2000, and they are moving down in 2001
- One fish didn't move all year in 2000 in the Lake, it moved up the Chiwawa in 2001

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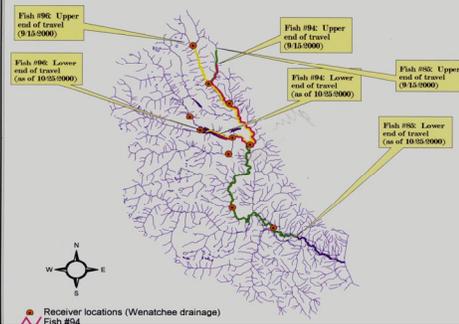
## Results Cont.

- Genetics – P. Spruell identified closest relationships were Clark Fork and Flathead fish
- Three fish are dead
  - Two tags returned and one irretrievable (death occurred after at least one month of successful tracking, carcasses not recovered)
  - All were larger fish
- SCCS Snorkeling resulted in location of radio tagged fish and observations that the scar tissue had healed to not be visually obvious except for the exit point of the antenna

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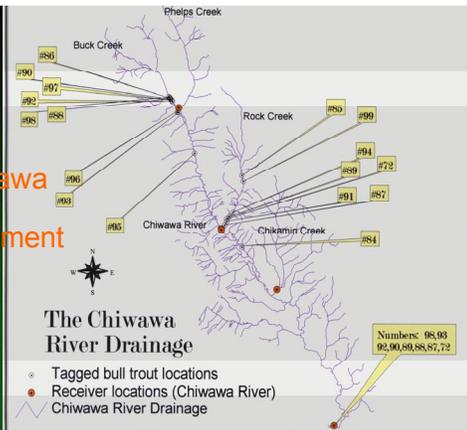
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## 2000 Fish Movement Wenatchee Watershed



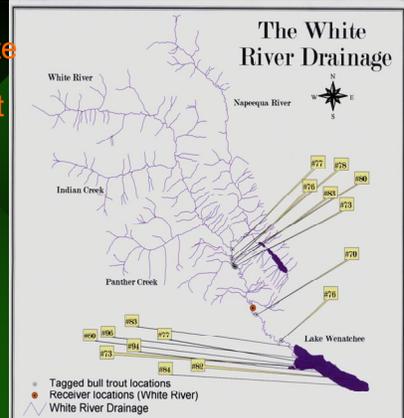
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## 2000 Chiwawa Fish Movement



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## 2000 White R. Fish Movement



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## Next Steps



- Tag additional fish in the lower basin, and potentially the rest in Lake Wenatchee, Nason Creek, and possibly Chiwaukum Cr. (30+ redds found at SCCS in Chiwaukum)
- Attach and retrieve thermal tags
- Continue to track 2000/2001 fish
- Identify smaller scale studies in the Wenatchee R.
- Implement pilot studies in the Entiat, Methow, and Yakima Rivers.

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## Products

- Anesthetic and Surgery information will be applied in permit conditions
- Prepare a paper of guidelines for surgery techniques and assist in future surgical bull trout tag implantation
- Migratory information will be added to Section 7 baselines, draft recovery plan chapters, etc.
- Information will be used to identify changes necessary in fishing regulations which will better protect bull trout
- A comparison of thermal tag data to instream thermographs placed every 2Km in the Chiwawa R.

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## Chelan, Douglas, and Grant PUD Columbia R. Bull Trout Telemetry Study

### Background

- Initiated as part of Rocky Reach relicensing
- Study expanded to include: Wells, Rock Island, and Wanampum Dams
- BioAnalysts completed trapping, tagging, and tracking
- Previous information about bull trout in the Mid-Columbia R. was limited to passage counts and incidental catch



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### Methods

- Traps were designed to capture bull trout in the ladders at Rock Island and Rocky Reach Dams, and the current trap was used at Wells Dam
- The goal was to capture 40 fish previous based on ladder counts
  - 10 at Wells
  - 20 at Rocky Reach
  - 10 at Rock Island



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### Results

#### Trapping and Tagging

- Trapping began on May 21 and a total of 39 bull trout were captured and tagged by July 13, 2001.
- 7 at Rock Island, 22 at Rocky Reach, 10 at Wells
- The median length and weight was 540mm and 3.85 lbs or 1,750 grams
- Surgery time averaged 8.0 minutes, with recovery time 13.5 minutes



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### Results Con't.

#### Tracking

- Boat surveys and aerial surveys
- 15 Methow R. Detections
  - 1 in Libby Cr
  - 1 in Buttermilk Cr
  - 10 in the Twisp R
  - 3 in the Methow Mainstem
- 13 Entiat R. Detections
  - 7 in the Mad R.
  - 6 in the Entiat Mainstem
- 6 Wenatchee Detections
  - 4 fish in Wenatchee Mainstem
  - 1 in Icicle Cr.
  - 1 in the Chiwawa R.

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### Next Steps/Products for the PUDs

- Continue tracking through June 2002
- Monitor downstream passage
- Conduct another year of studies???
- Identify effects of ongoing operations
- Develop protection/enhancement measures
- Continue consultations (currently there is no coverage for take at the PUD's dams)
- Final license application due June 2004



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### Recommendations From Telemetry Studies

- Develop a coordinated effort to look at migration of bull trout through out the Columbia River.
  - are other core areas connected? Are Recovery Units connected? How far up is there anadromy?.
  - place receivers at each dam and use FERC relicensing as an avenue.
- Implement a genetics baseline study to help identify sources of these adult migratory fish.
  - how are tagged fish connected to spawning populations? How are local populations within the core area affected by management of dams, diversions, fishery regulations? Is it a big deal or not?

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## Recommendations Con't.

- Implement pilot studies in core areas when spawning areas are unknown (Methow, Upper Yakima, Entiat, and others).
- Attempt site specific tracking look at habitat used, 24 hour movements, winter movement, and feeding behaviors.
- Further develop the surgical procedure paper and expand on new knowledge of MS 222, pH, knot techniques, and archival tag attachment

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## Recommendations Con't.

- Look at sampling adult populations with snorkeling before spawning, screw traps after spawning, etc.
  - are there multiple runs? Are there alternate year spawners?
- Since bull trout are the wolves or grizzly bear of the stream and salmon and other fish are like the deer, mice, and moths, in the ecosystem, we need to begin looking at an ecosystem approach to fishery management instead of single species management

(monitoring of other species such as whitefish, lamprey, and freshwater mussels may prove to be important to the aquatic ecosystem and to bull trout)

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## Ode to the Bull Trout

By Nick Arneson, BSA/NAFTA  
Bull Trout Trap Operator

Come, Little Bull Trout, Come,  
Come, One and All.  
Swim In to Our Trap,  
Come, Big or Small.

We Prefer 16 Inches,  
But 15 Will Do.  
The Study's Behind  
'Cause You Never Come  
Through

We're Over Here!  
On Your Left, Your Right,  
So, Come On Up,  
Swim Just Past the Light.

Now, Don't Turn Around,  
As The Door Swings Open,  
Just Swim on In,  
We'll Put You In Potion.

Just a Small Cut,  
And an Antenna Too,  
A Few Tiny Stitches,  
You'll be Feeling Like New.

Back To Your Home,  
Wherever That's At,  
But Where and How Far  
Now We Can Track

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