

# Assessing the Feasibility of Reintroducing Bull Trout into the Clackamas River, Oregon



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**Columbia River**

## Bull Trout Distribution

 Historical

 Current

**Willamette River**

**Clackamas River** (last verified 1963)

**North Santiam** (last verified 1945)

**South Santiam River** (last verified 1953)

**McKenzie River**

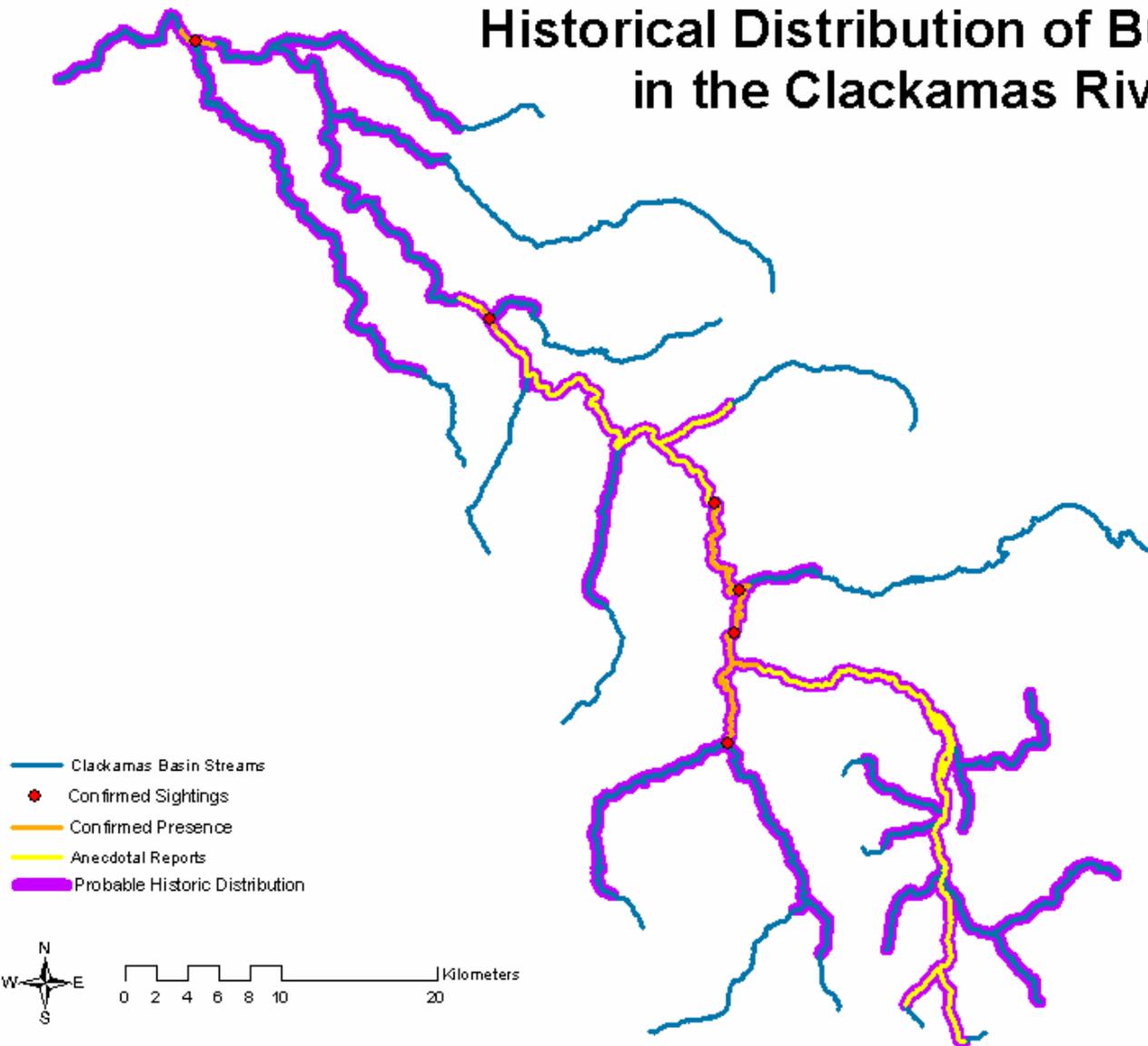
**Middle Fork Willamette River**

(last verified 1990) re-introduction  
underway since 1998 using fry transplants  
from Anderson Creek, McKenzie River

# Why the Clackamas River?

- Draft Recovery Plan – Major Goal is to Restore Bull Trout to Historic Habitats (where habitat is deemed suitable)
- Bull Trout Extirpated or Depressed in Numerous Areas in Southern and Western Parts of Species Range
- Bull Trout Extirpated from Three of Four Major Tributaries of the Willamette River
- Natural Recolonization Highly Unlikely
- Clackamas River Contains Sufficient Suitable Habitat to Support a Reintroduction

# Historical Distribution of Bull Trout in the Clackamas River



# Causes for Clackamas Bull Trout Decline, and Extirpation Hypothesis

- **Fish Passage**
  - Hydropower & Industry
  - Hatchery Racks & Weirs
- **Fish Management**
  - In-River Commercial Salmon Fisheries
  - Negative Sentiment Toward Bull Trout (“Dollar Varden” derbies in the 1960s)
  - Intensive Trout Stocking, Liberal “Trout” Limits, Heavy Angler Pressure
- **Forage Base**
  - Periods of Extirpation and Reduced Abundance of Anadromous Salmonids
- **Habitat Degradation**
  - Timber Harvest, Roads, Agriculture
- **Water Quality**



# Literature Utilized to Guide the Clackamas Feasibility Assessment

- AFS Guidelines for Introductions of Threatened & Endangered Species (Williams et al.1988, *Fisheries*)
- Integrating Conservation Genetic Considerations into Conservation Planning (Epifanio et al. 2003, *Fisheries*)
- Translocation as a Tool for Conserving Imperiled Fishes: Experiences in the Western U.S. (W.L. Minckley. 1995. *Biological Conservation*)
- Conservation genetics of bull trout: Geographic distribution of variation at microsatellite loci. (Spruell et al. 2003. *Conservation Genetics*)

# Major Components of the Reintroduction Feasibility Assessment

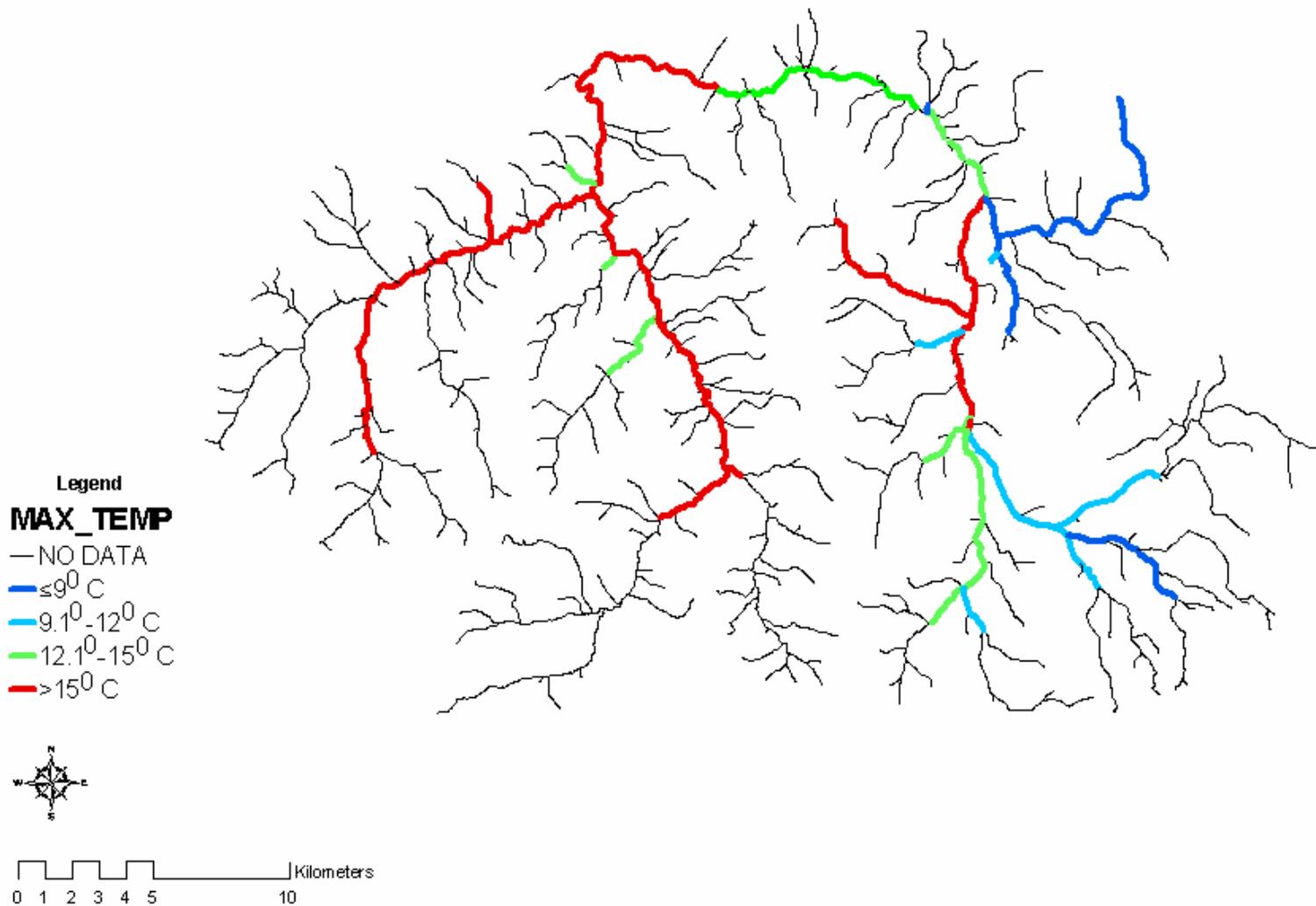
- Threats Assessment
- Habitat Assessment
- Donor Stock Availability
- Donor Stock Risk
- Genetic Considerations
- Ecological Interactions
- Monitoring & Evaluation
- Synthesis & Recommendation

# Feasibility Assessment

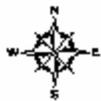
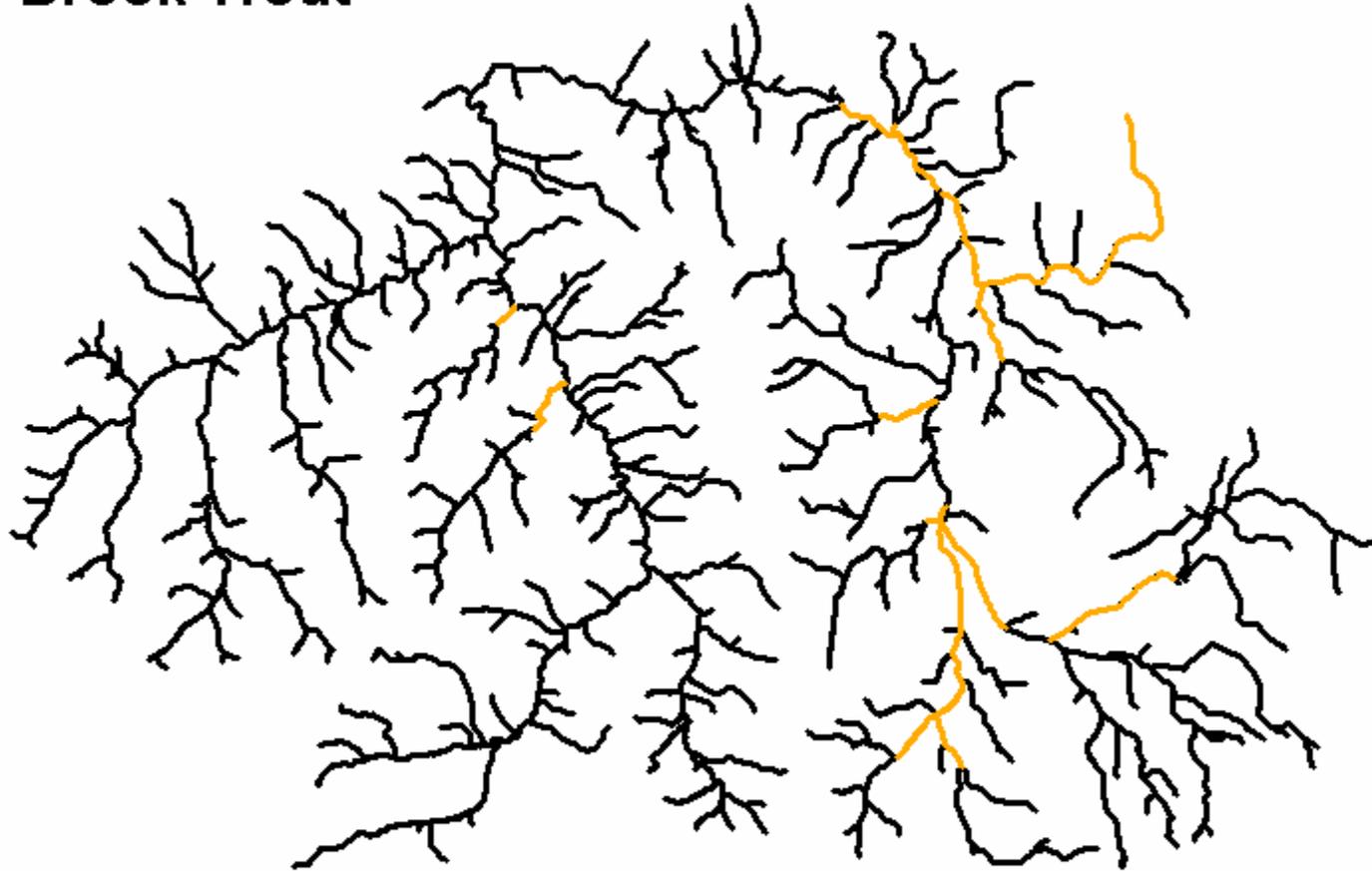
## Habitat Analysis

- Relied on Previously Collected Data
- Exception: Additional Stream Temperature Data
- Assessment Included Analysis of:
  - Natural Barriers
  - Stream Volume
  - Catchment Size
  - Road Density
  - Stream Temperature (Daily Summer Maximum)
  - Patch Connectivity Between Streams Containing Suitable Habitat
  - Brook Trout Presence/Absence
  - Stream Miles Available for Spawning and Rearing

# Maximum Temperature Upper Clackamas and Collawash Rivers



- \*Anadromous**
- \*Catchment Area > 1,700 Acres**
- \*Maximum Temperature < 15<sup>o</sup> C**
- \*No Brook Trout**



# Sample of Suitable Spawning and Rearing Streams in the Clackamas

Last Creek



Upper Clackamas River



Pinhead Creek



Cub Creek



# Feasibility Assessment

## Ecological Interactions

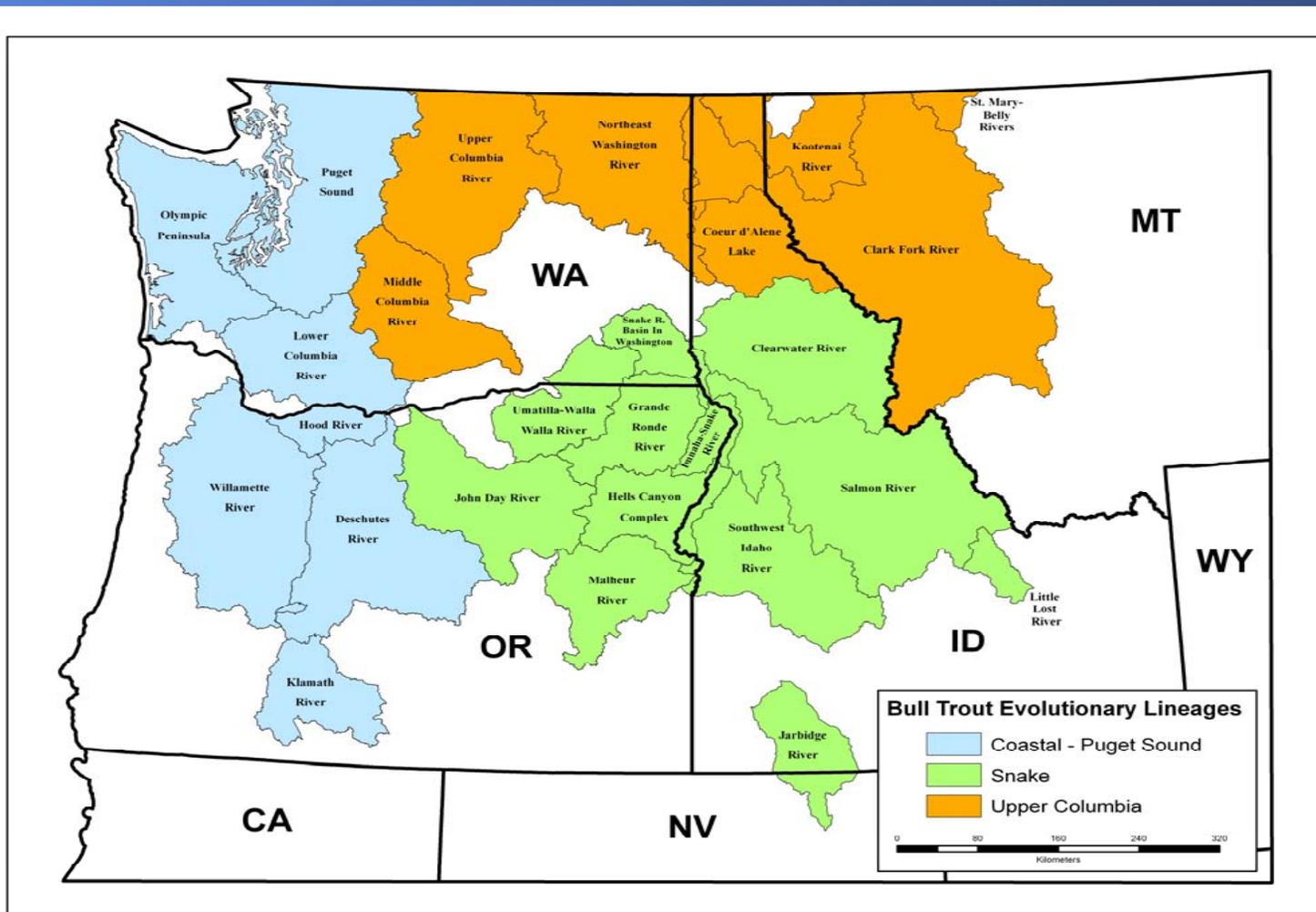
- **Brook Trout Presence (Competition/Hybridization)**
- **Other Native and Non-native Fish Presence**
- **Forage Base**
- **Interactions with Listed Anadromous Salmonids (Competition, Predation)**

# Feasibility Assessment

## Genetic Considerations

- How to prioritize donor stocks from a genetic perspective?
- How to limit risk to a donor population – i.e., what is the minimum population size to qualify as a donor population?
- How many individuals and what life stage to stock (and over what timeframe) to reflect the genetic composition and survival capabilities of source population?

# Feasibility Assessment: Evolutionary Lineage



# **Feasibility Assessment**

## **Donor Stock Assessment**

**Limited Assessment to Populations in the Lower Columbia River Evolutionary Lineage for Biological, Ecological, Genetic Reasons**

- **Willamette Basin - McKenzie River Subbasin**
- **Deschutes Basin – Metolius River Subbasin**
- **Lewis Basin**
- **Hood River Basin**
- **Klickitat River Basin**

# Estimated Donor Population Abundance

Basin	Population	Estimated Adult Spawner Abundance	Population Trend
Willamette	McKenzie River	~200	Slight Decline
Lewis	Lewis River (Swift Reservoir)	~1,200	Increasing
Deschutes	Metolius River	~2,000	Increasing
	Lower Deschutes River	~300 to 400	Stable
Hood	Clear Branch Creek	~100 to 200	Unknown
Klickitat	Klickitat River	Unknown	Unknown

\* Adult spawner abundance based primarily on redd counts x 2 fish per redd, averaged over the last 3 years, combined with expert opinion.

# Feasibility Assessment

## Reintroduction Strategies

- **Transplantation**
  - Eggs, Fry, Juveniles, Sub-adults, Adults
- **Captive Rearing**
  - Fry, Juveniles
- **Artificial Propagation**

Inherent With Any of These Strategies is the Need to Address: (1) Risk to the Donor Population (2) Life Stage to Introduce (3) Number to Introduce to Fully Reflect the Genetic Composition and Survival Capabilities of Donor Stock; and (4) How Long to Conduct the Transfer (i.e. over how many years?)

# Feasibility Assessment Monitoring and Evaluation

- Survival
- Distribution
- Spawning success
- Recruitment
- Growth
- Species Interactions
- Genetic Monitoring
  - Donor Stocks & Transplants



## Next Steps

- **Feasibility Assessment Scheduled to be Completed in 2006**
- **If Reintroduction is Determined to be Feasible then Develop:**
  - **A Proposed Action**
    - **Regulatory Requirements**
    - **Public Outreach**
  - **A Reintroduction Plan**

