

Utilizing Conservation Aquaculture for Bonneville Cutthroat Trout in Idaho



Acknowledgments

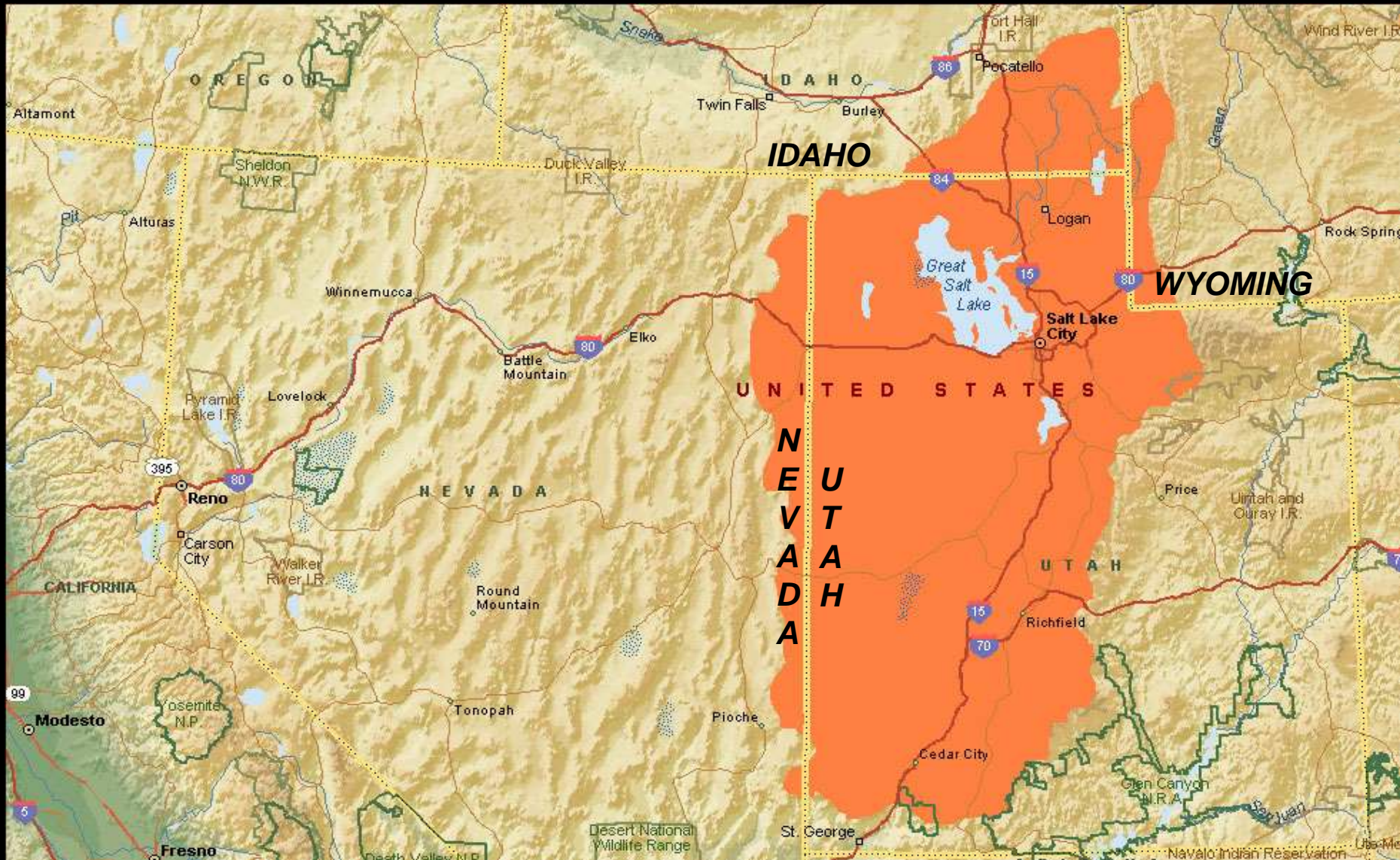


**Grace Fish
Hatchery Staff
2010 - present**



Bonneville Cutthroat Trout (BCT)

Oncorhynchus clarkii utah



Management Plan for Conservation of BCT in Idaho

(Teuscher & Capurso 2007)

GOAL:
Ensure long-term
viability and
persistence within
historical range in
Idaho at levels
capable of
providing angling
opportunity.



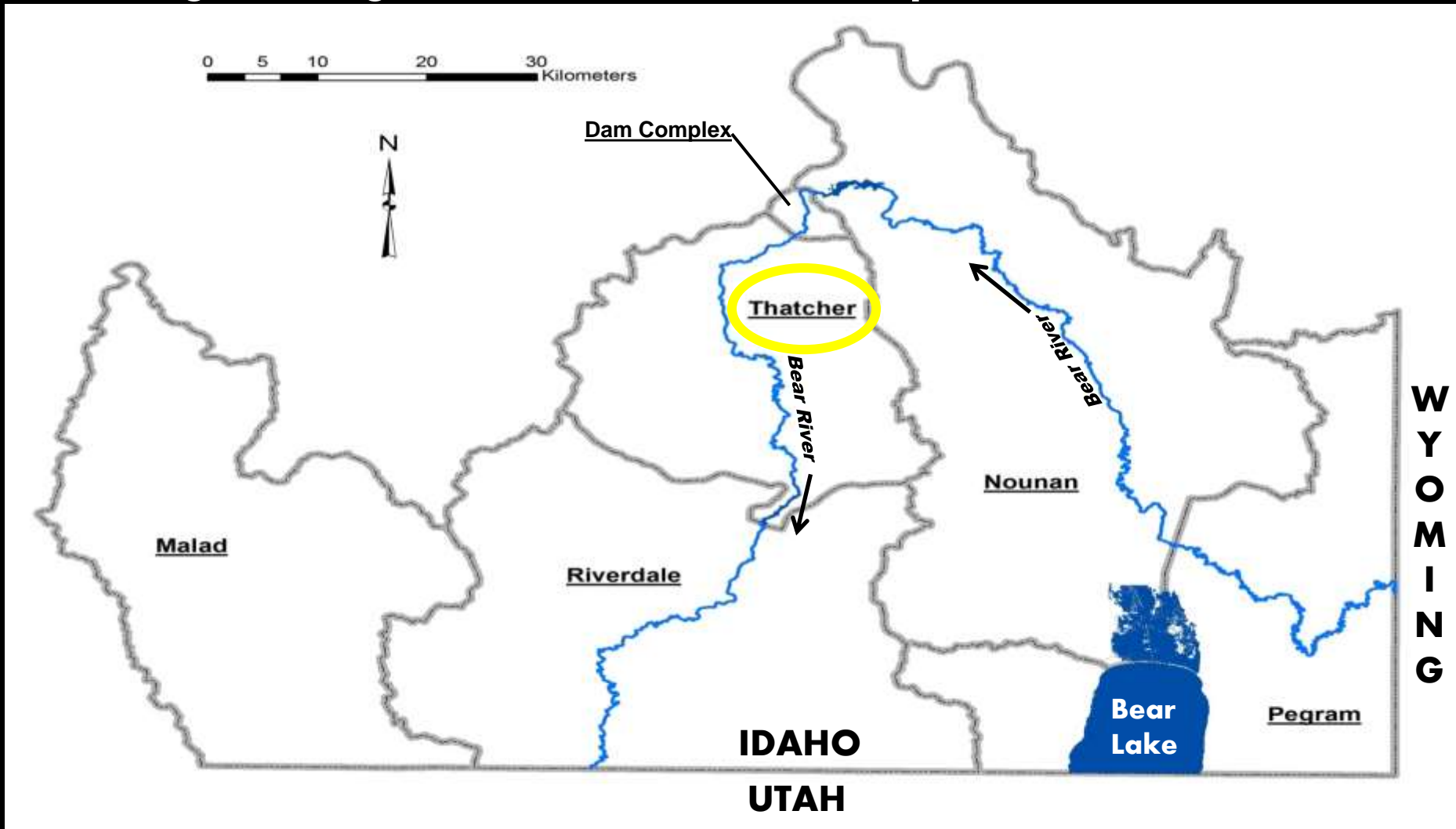
Management Plan

Primary Objectives:

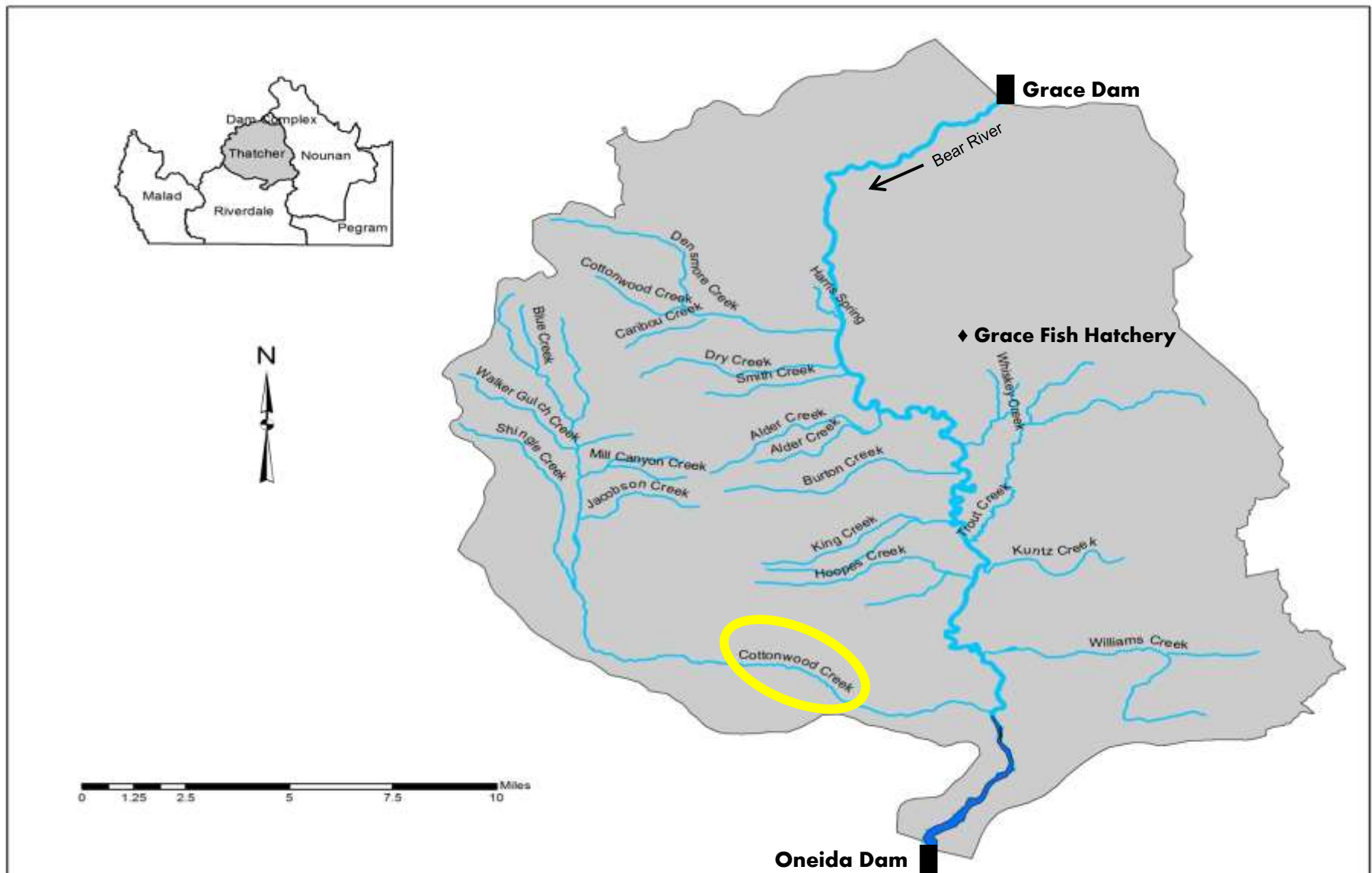
- 1. Preserve genetic integrity**
- 2. Maintain current distribution**
- 3. Supplement or reestablish populations**

BCT Management Units (MU)

- Southeast Idaho, 6 MU's
- Reflect isolated populations (Teuscher and Capurso 2007)
- Significant genetic differentiation (Campbell et al. 2007)



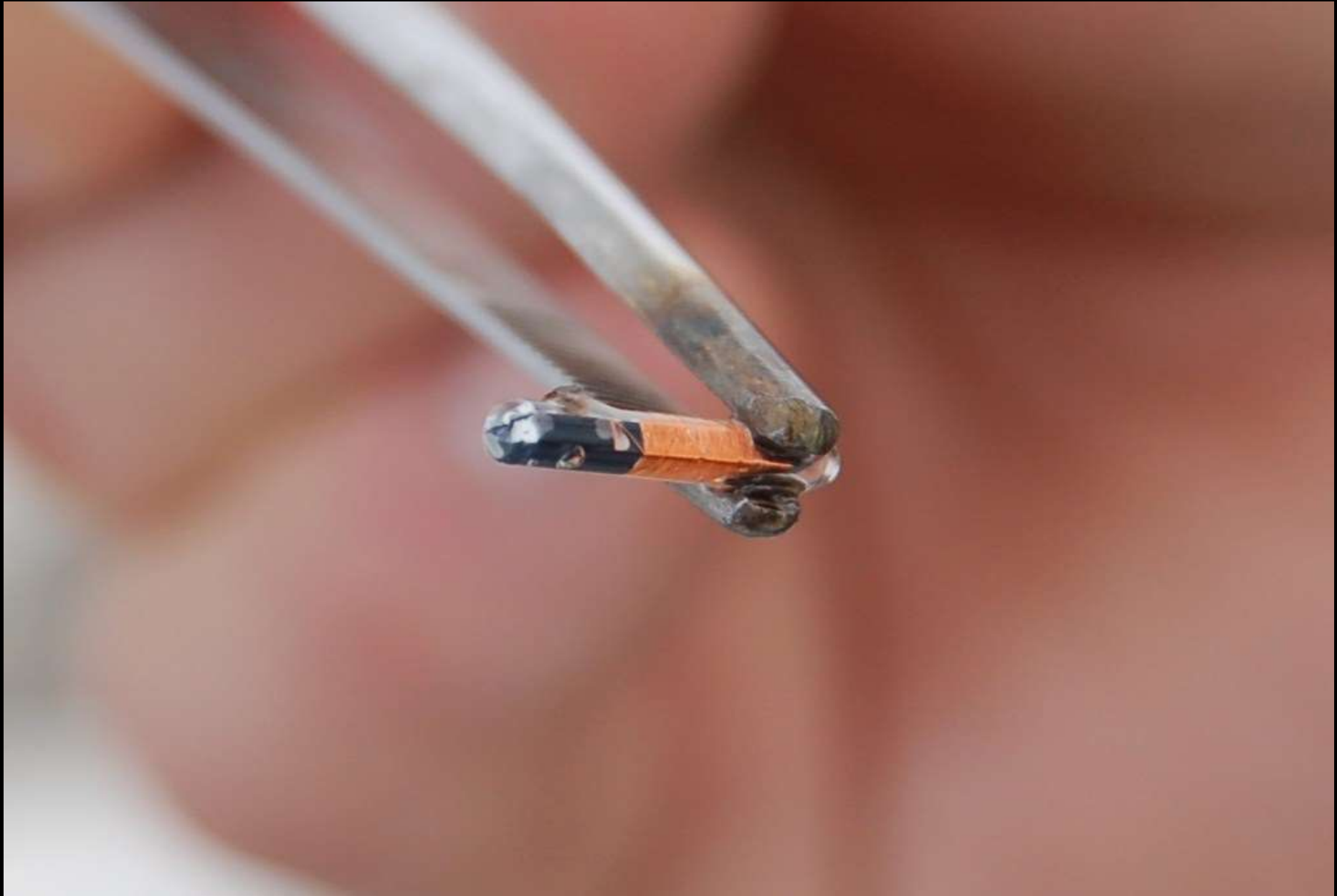
Broodstock Development in the Thatcher MU



Collecting Wild Broodstock



Confirm Genetic Purity



Brood Pond



Fish Trapping



Pre-Spawn Holding



Spawning



Preparing Eggs for Transport

- Eggs rinsed clean
- Water hardening on site = 1 hour
- Eggs → Mesh bag to isolate families

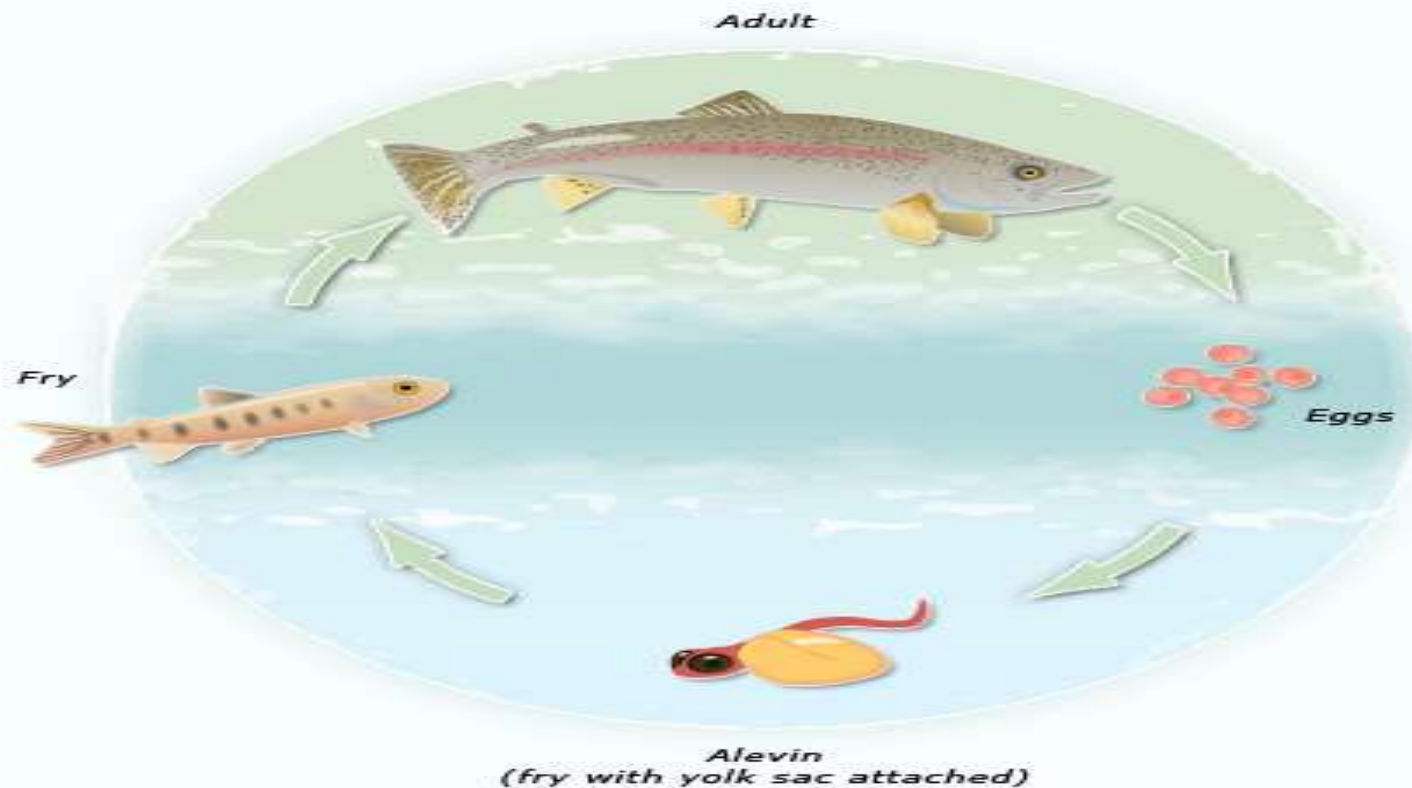


Fertilized Eggs → Grace Fish Hatchery

- **Iodophor = 10 minutes @ 100 ppm (Piper et al. 1982)**
- **Eggs → Plastic mesh boxes to isolate families**



Development Stage Guidelines at Grace Fish Hatchery



Incubation

- **Grace production water = 54°F**
- **22 TU/day**
- **Eye-up = 352 TU's**



Hatching

- 462 TU → 528 TU
- Stop formalin no later than 418 TU



Ponding

- **Swim-up = 858 TU → 924 TU**
- **Initiate feed = 924 TU**



Year 1 Isolated Rearing

- Iso rear 48 unique families
- Determine genetic variation within population



Broodstock Genetic Variation Analysis

- **Population = sufficient genetic variation**
- **Captive brood not necessary**
- **Random 1 x 1 crosses = OK**



Production Goals

- **Goals have changed since inception**
- **Initial = 20,000 Spring fingerlings (3")**



Current Production

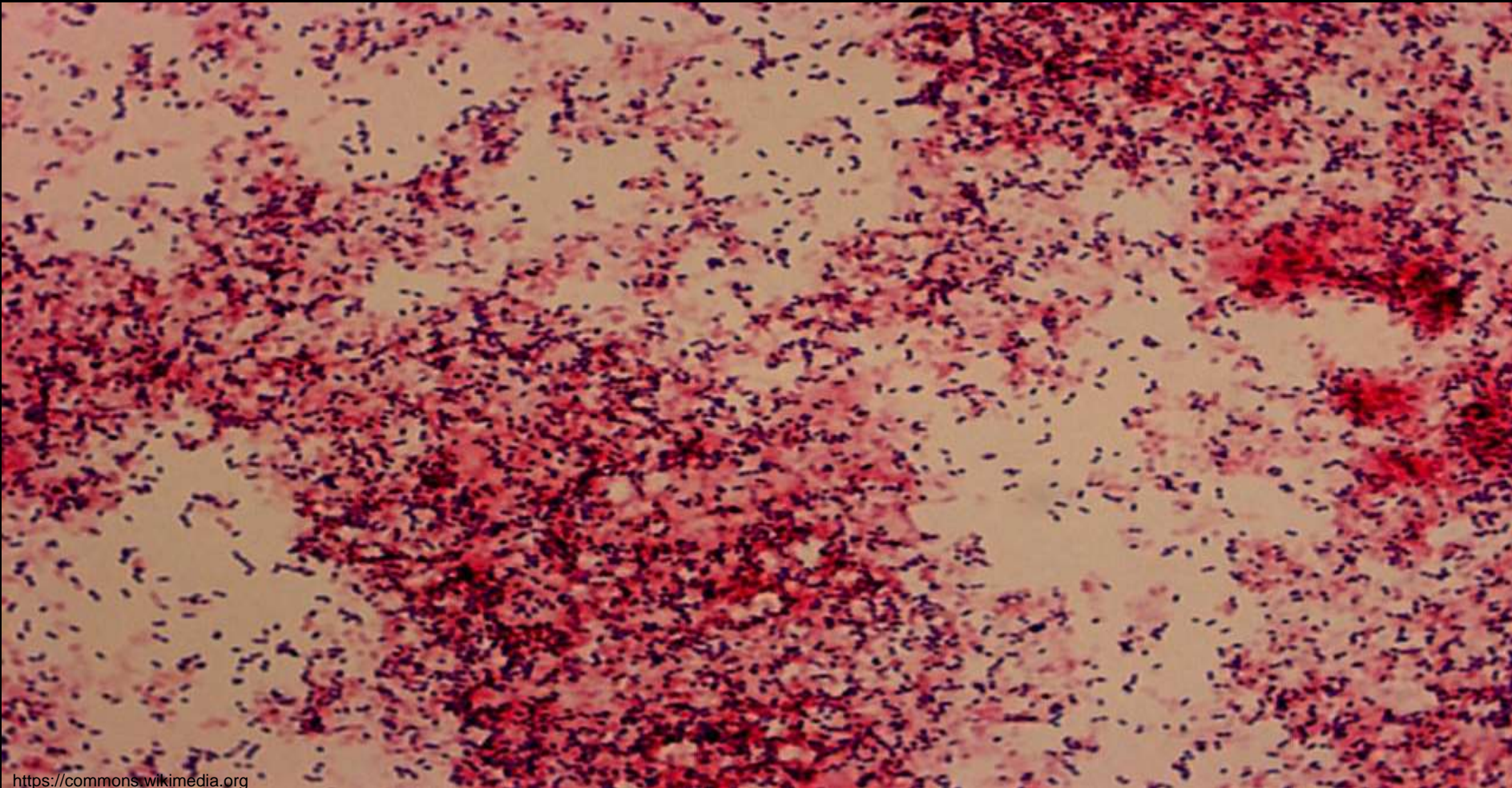
- **Cormorant Predation = Major Impact**
- **Now = 20,000 Fall catchables (9"-10")**



Getty Images

Production Challenges

- Disease sampling performed on spawned ♀
- *Renibacterium salmoninarum* (*Rs*)
- ELISA values ≥ 0.25 = cull eggs



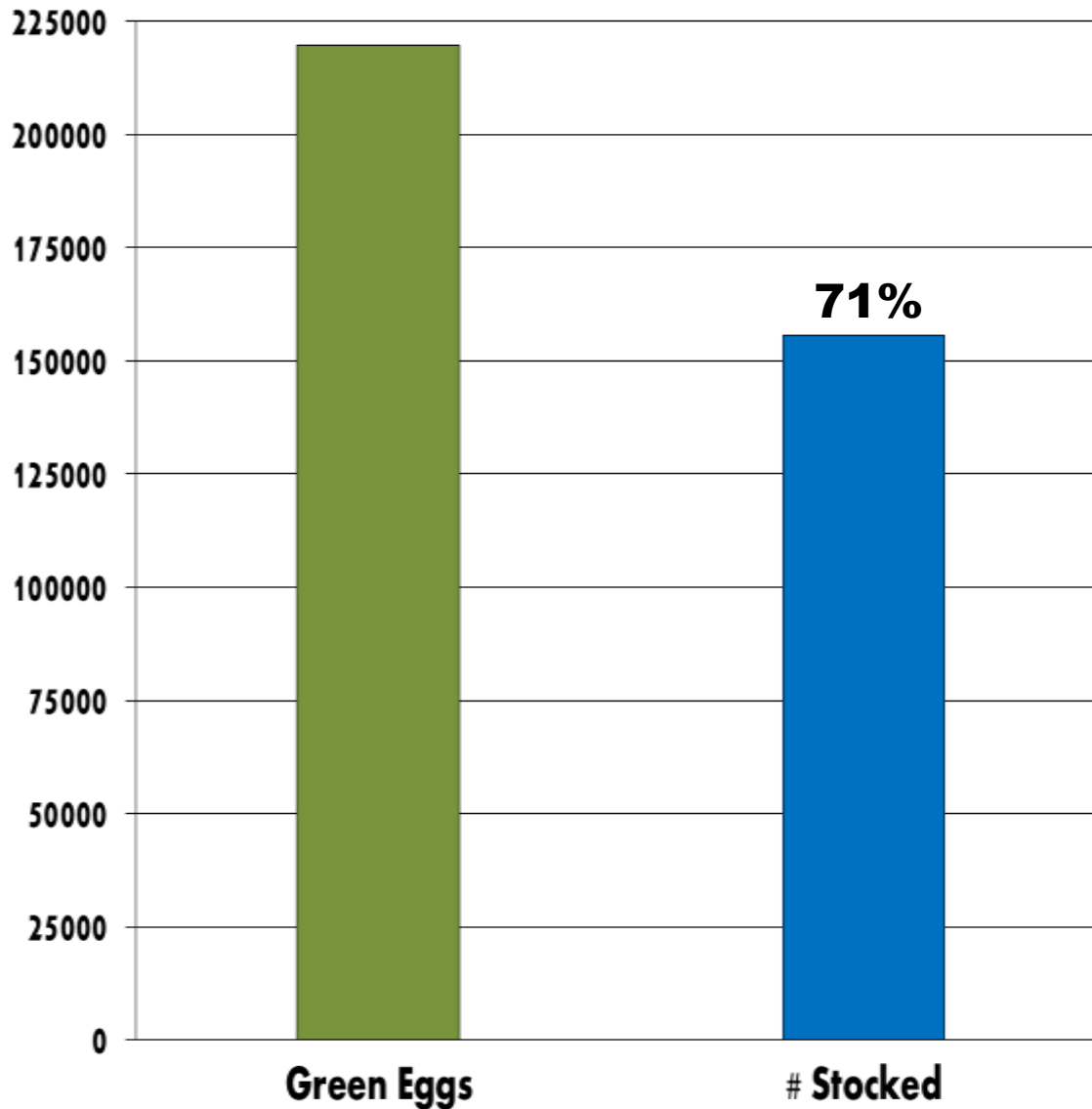
Production Challenges

- *Nephrocalcinosis*
- Precipitation of calcium carbonate in the kidney tubules
- Prolonged exposure to high dissolved CO₂
- Low, chronic mortality



Survival at the Hatchery

BCT Egg to Stocking Survival, 2010-2016



- **Avg. % eye-up = 83%**
- **Avg. feed conv. = 1.1**

Success!!!

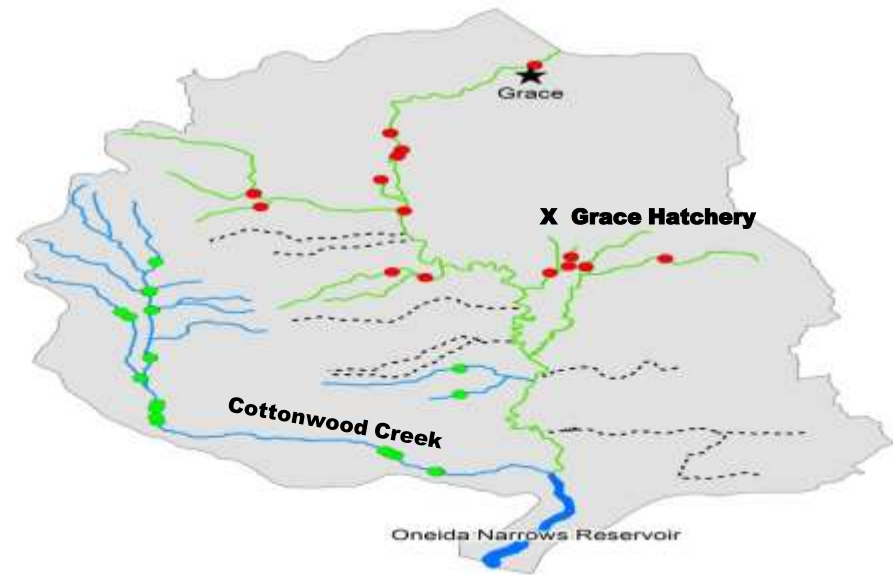
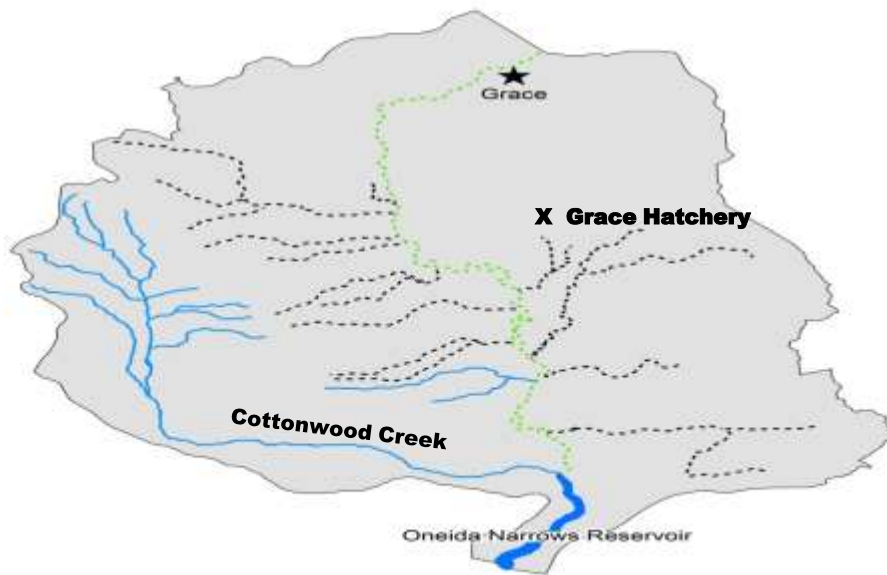


Conservation Hatchery Program

Thatcher Management Unit

Before

Current



-  Broodstock Collection Sites
-  BCT Stocking Sites
-  Rare or Absent
-  Absent
-  Present
-  BCT Supplementation 2011-16

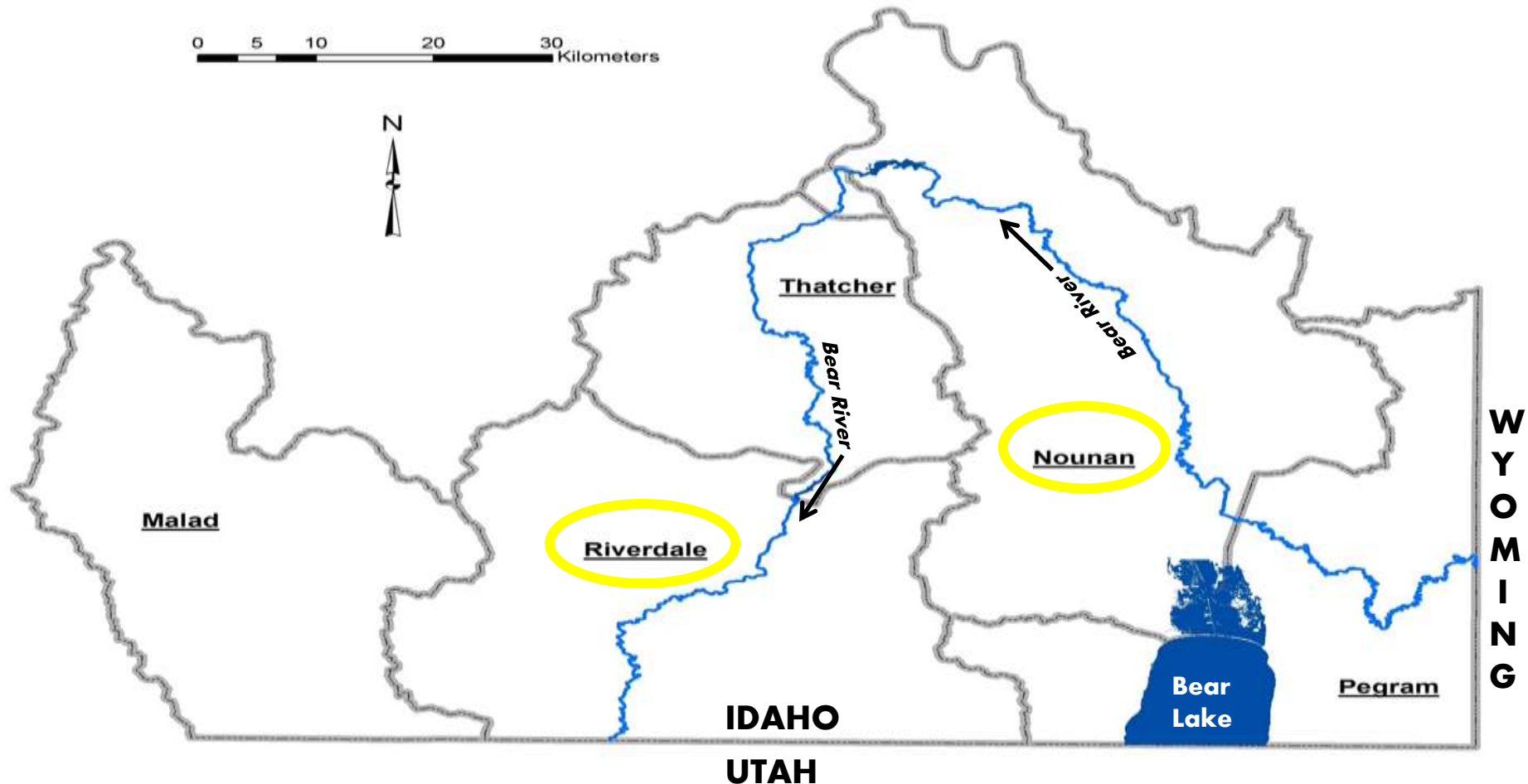
Future Plans for BCT in Idaho

- **Begin utilizing new brood ponds**
- **Comprehensively monitor CO₂ at Grace Hatchery**
- **Implement more effective degassing equipment**
- **Currently investigating use of erythromycin to reduce *Rs***



Future Plans for BCT in Idaho

- Continue to restore habitat & utilize conservation aquaculture
- Use Thatcher MU as template
- Preserve, Protect, Perpetuate & Manage
- Achieve results via cooperation (IDFG, PacifiCorp, ECC)



Future Plans for BCT in Idaho

Thank You

