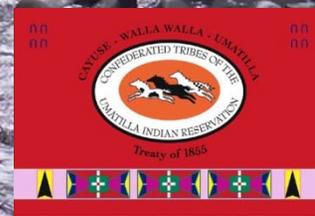
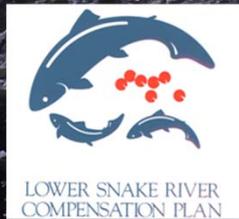


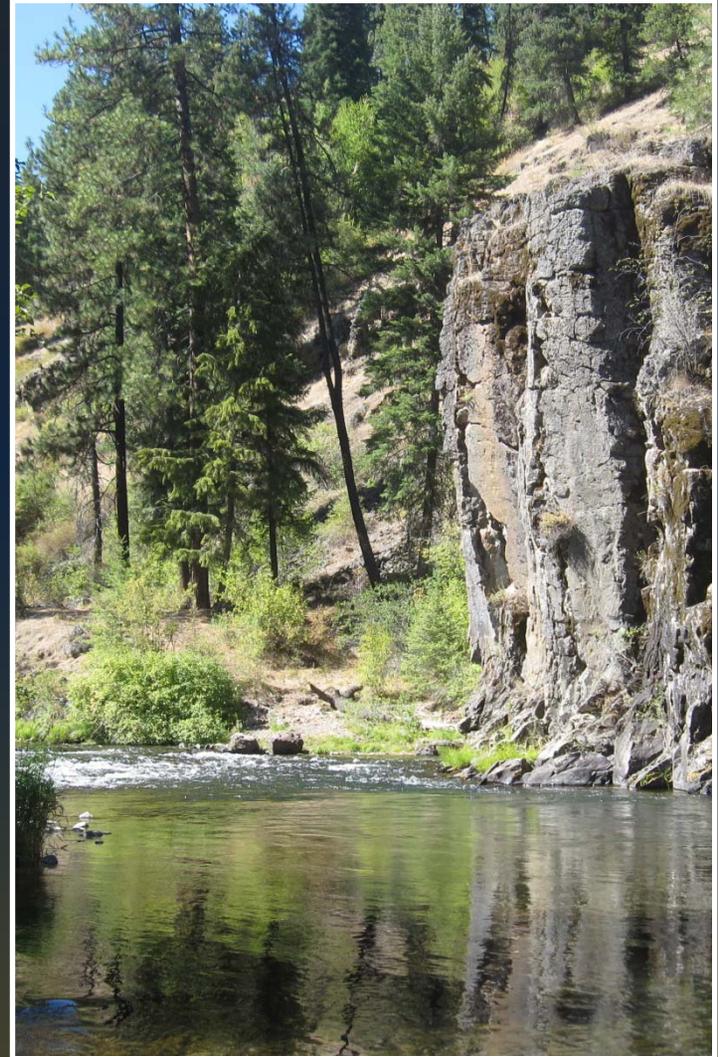
In-Basin Straying of Hatchery Spring Chinook in Wilderness Streams of the Grande Ronde River

*Jeff Yanke, Tim Bailey, Kyle Bratcher,
Joseph Feldhaus, and Tim Hoffnagle*



Early Grande Ronde LSRCP Program

- Lookingglass Hatchery (LFH)
 - Central program facility
- Early program
 - Rapid / Carson stocks
 - Most releases at LFH, some outplants in-basin
- Early outcomes
 - Stray rates in wilderness streams ranged 2-18%
- Program reforms late-1990's

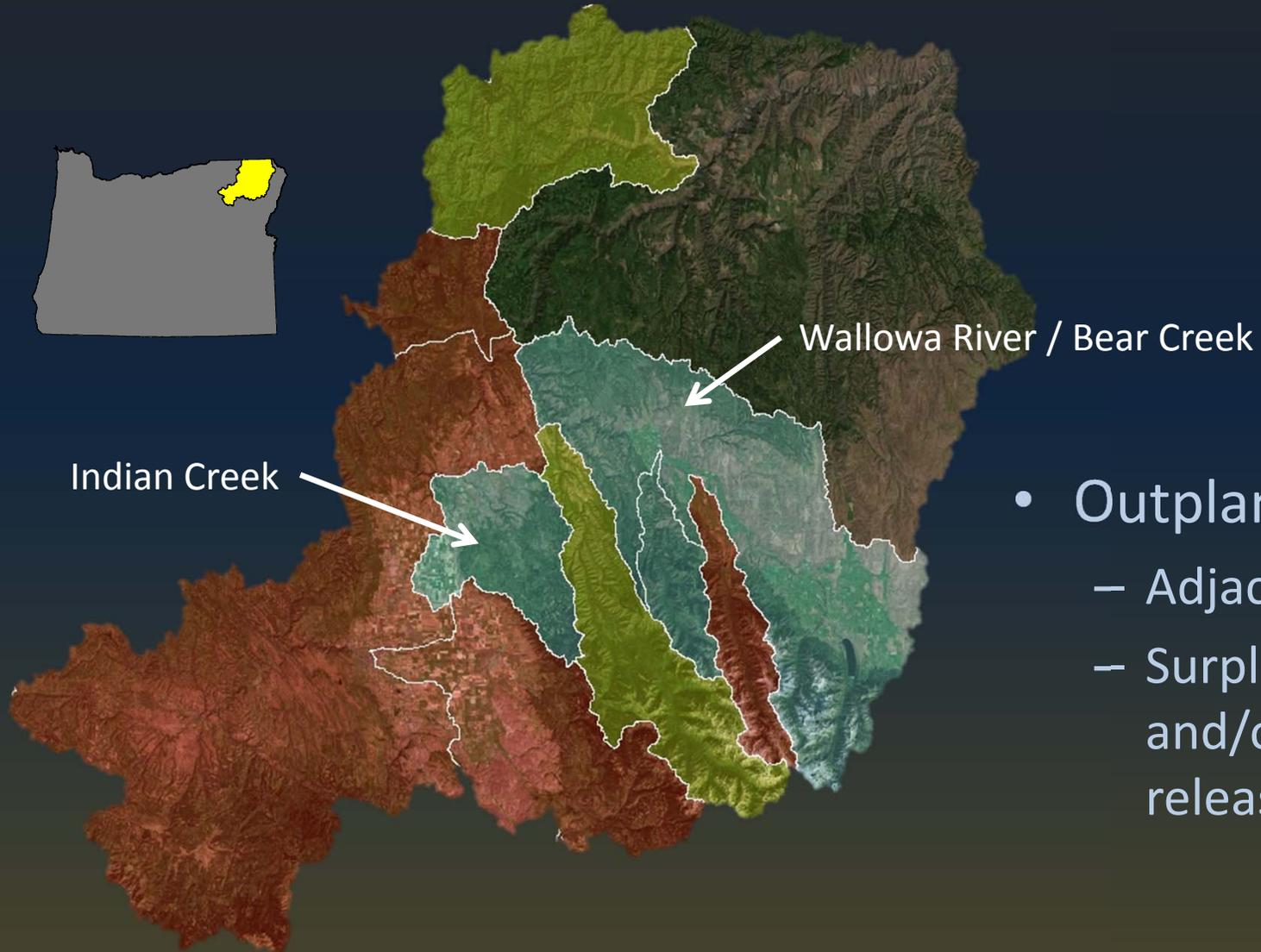


Grande Ronde River Endemic Program



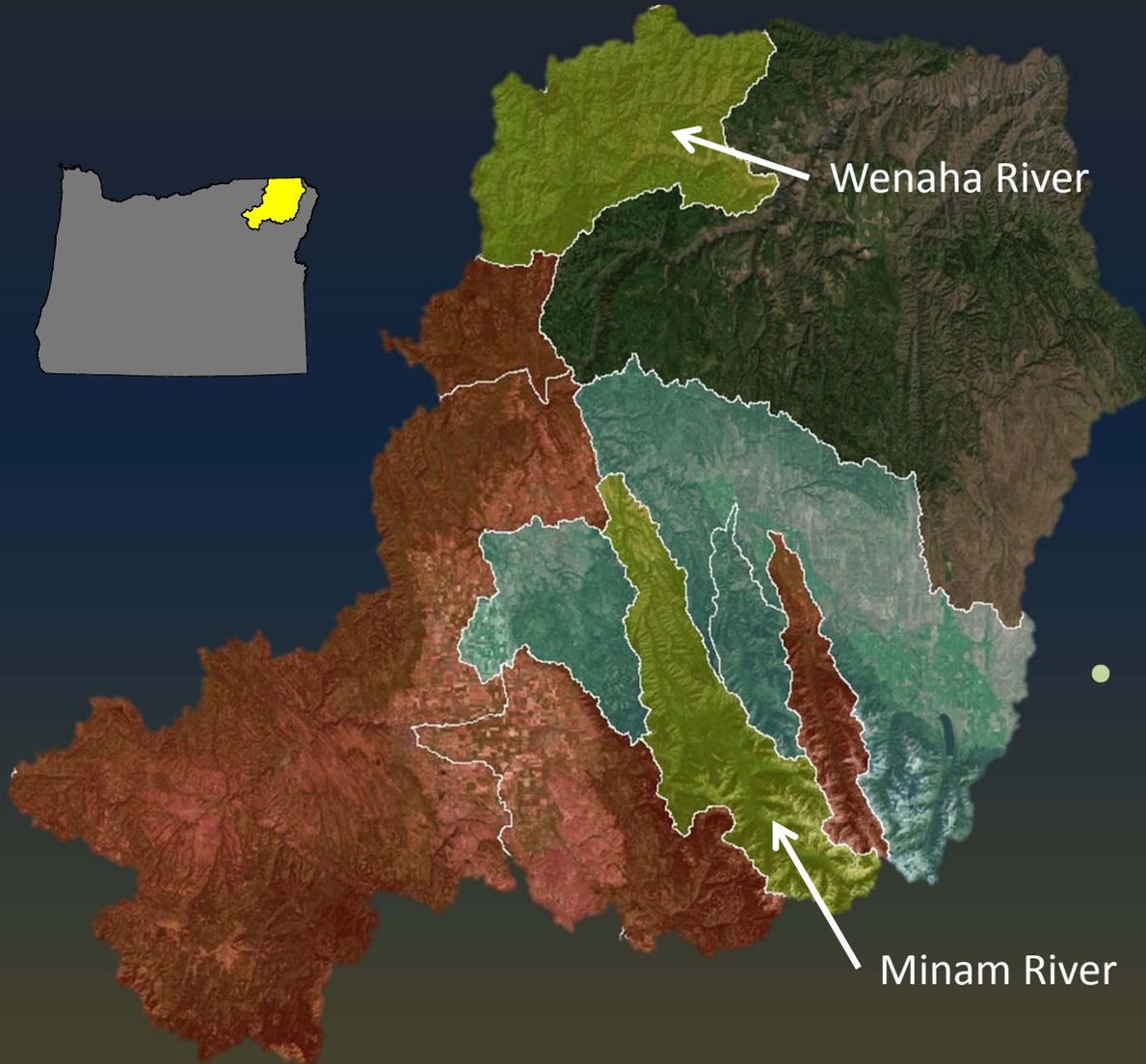
- **Direct supplementation**
 - Formal release goals
 - Locally-adapted stocks
 - Adult weirs and release sites
 - Sliding scale management

Grande Ronde River Endemic Program



- Outplants
 - Adjacent basins
 - Surplus adults and/or parr releases

Grande Ronde River Endemic Program



- Natural production
 - No intentional hatchery influence

Minam and Wenaha Rivers

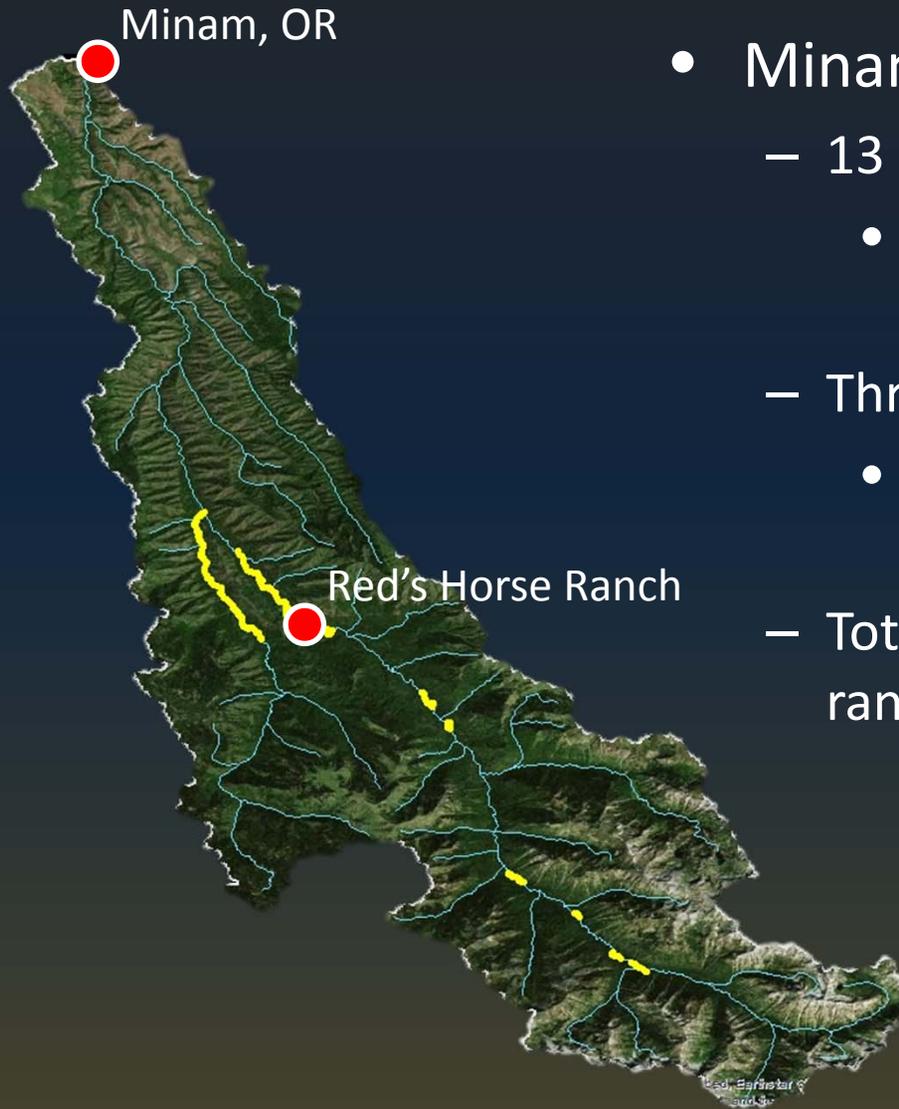
- Wilderness character
 - Remote
 - Pristine habitat
 - Most ecologically-intact systems
- Management objectives
 - Maintain genetic integrity
 - Reference population
 - Wild sanctuary



LSRCP Monitoring Objectives

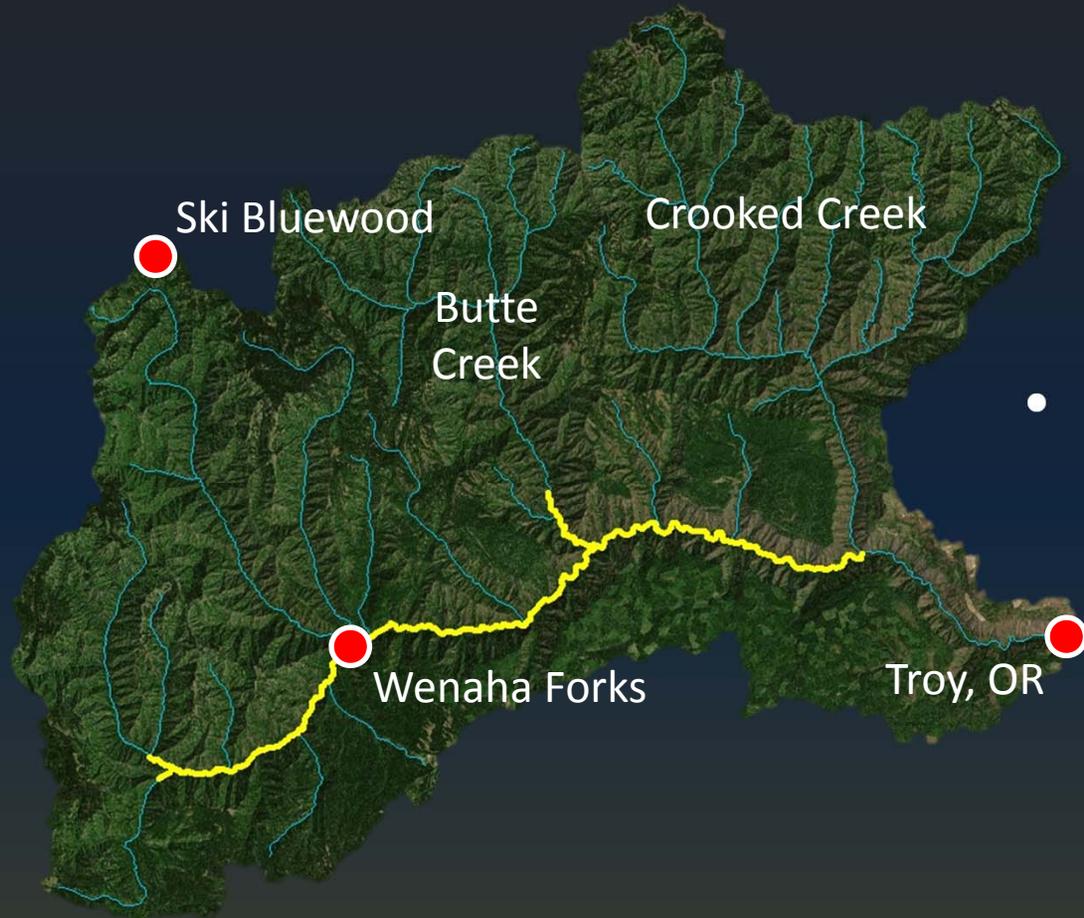
- Determine the success of maintaining genetic integrity of endemic wild spring Chinook salmon in the Minam and Wenaha Rivers
 1. Quantify the relative abundance of stray hatchery spring Chinook recovered in spawning areas.
 2. Recover coded wire tags (CWT) from carcasses to determine the origin of hatchery spring Chinook found in spawning areas.

Annual Surveys - Minam



- Minam River
 - 13 reaches, 13 stream miles
 - Elk Creek downstream to Little Minam River
 - Three surveys annually
 - Upper & Little Minam surveyed once
 - Total carcass recoveries range from 22-126

Annual Surveys - Wenaha



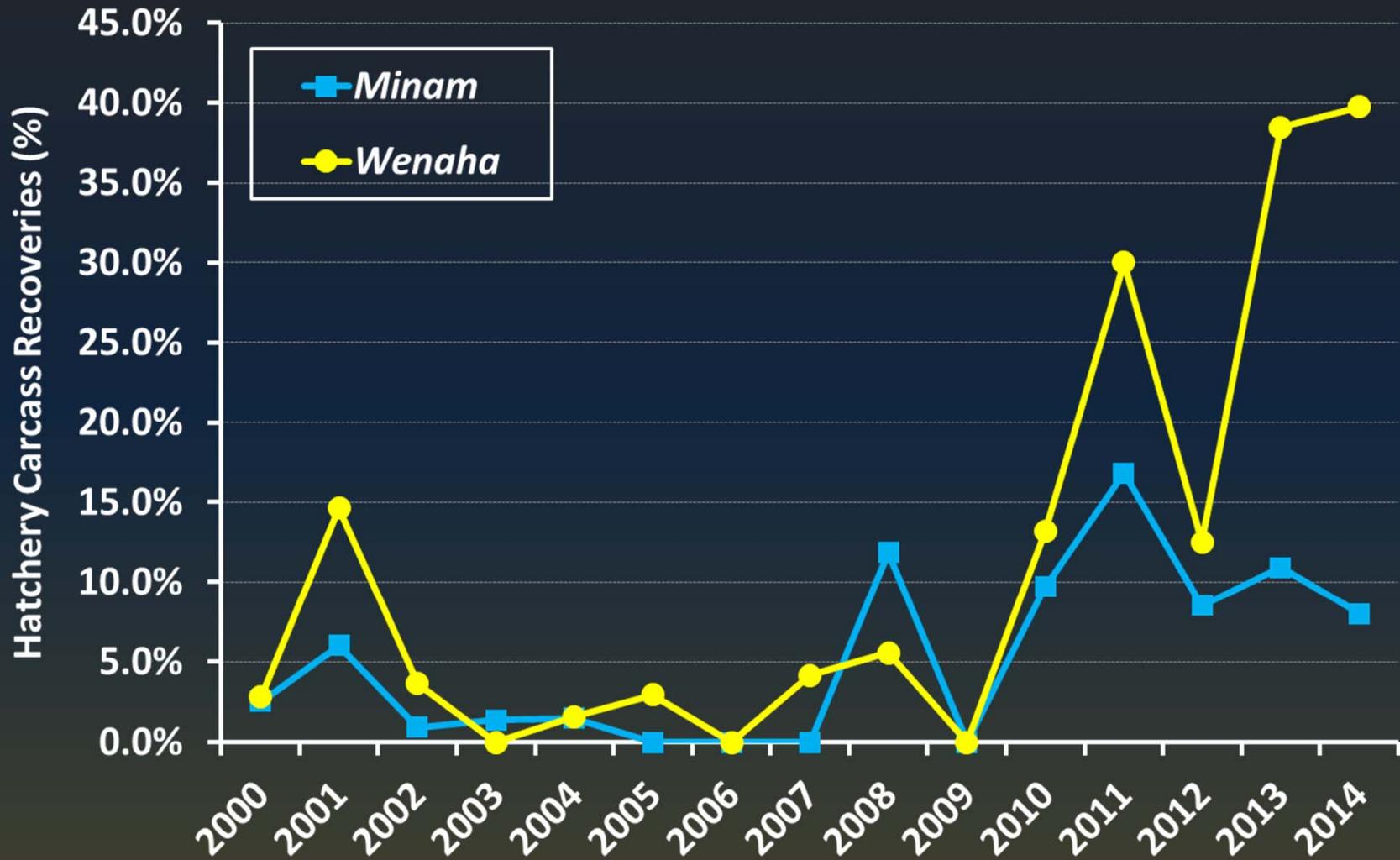
- Wenaha River
 - 14 reaches, 24 stream miles
 - Milk Creek downstream to Crooked Creek
 - Two surveys annually
 - Total carcass recoveries range from 20-83

Carcass Recoveries

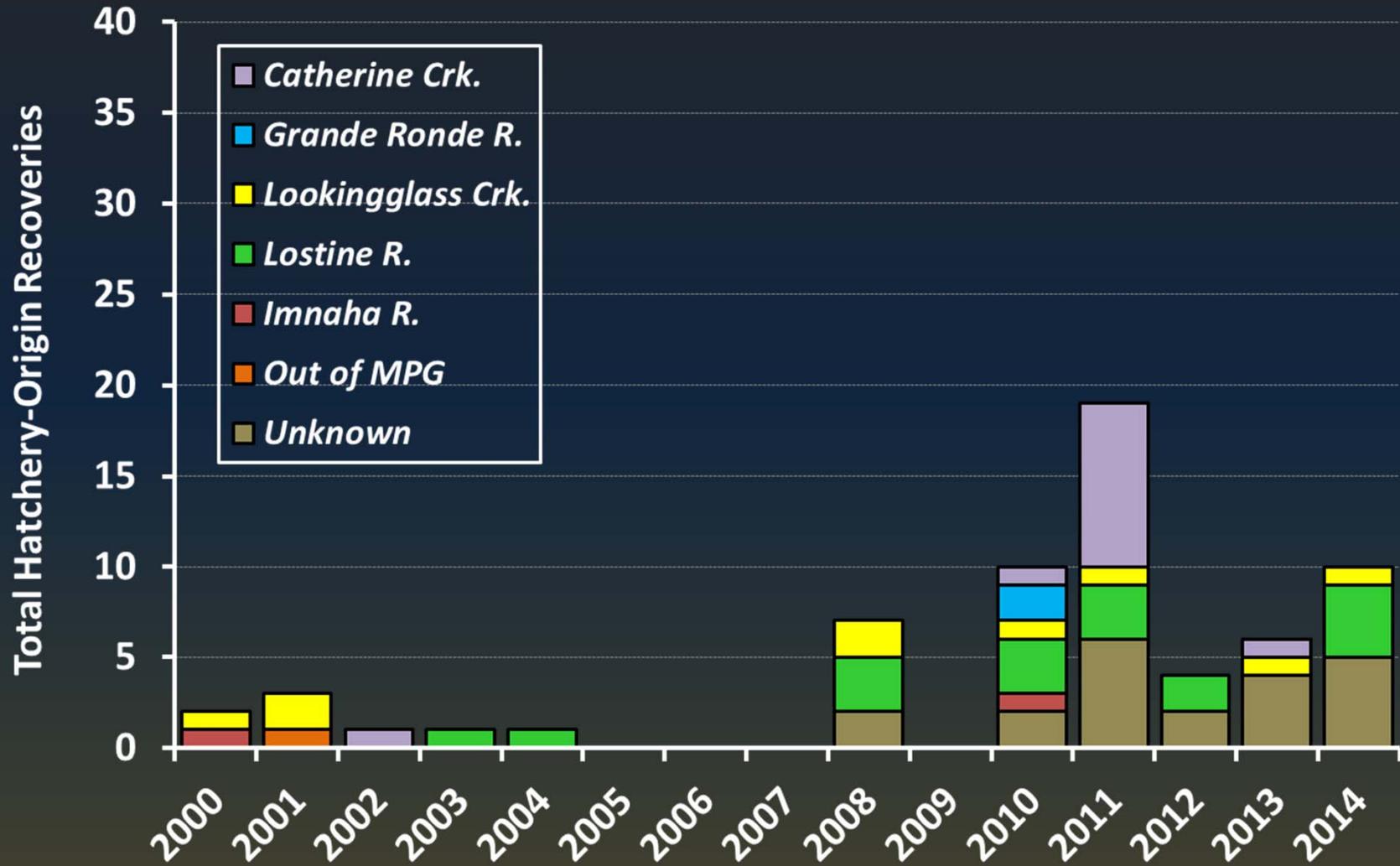


- Recovery probabilities
 - Adults < 25%
 - Jacks < 10-15%
- Identification
 - Visual mark / Fin wear
 - Opercule punches
- CWT recovery
 - Only CWT-positive snouts packed out
 - Tags recovered, read, and independently verified

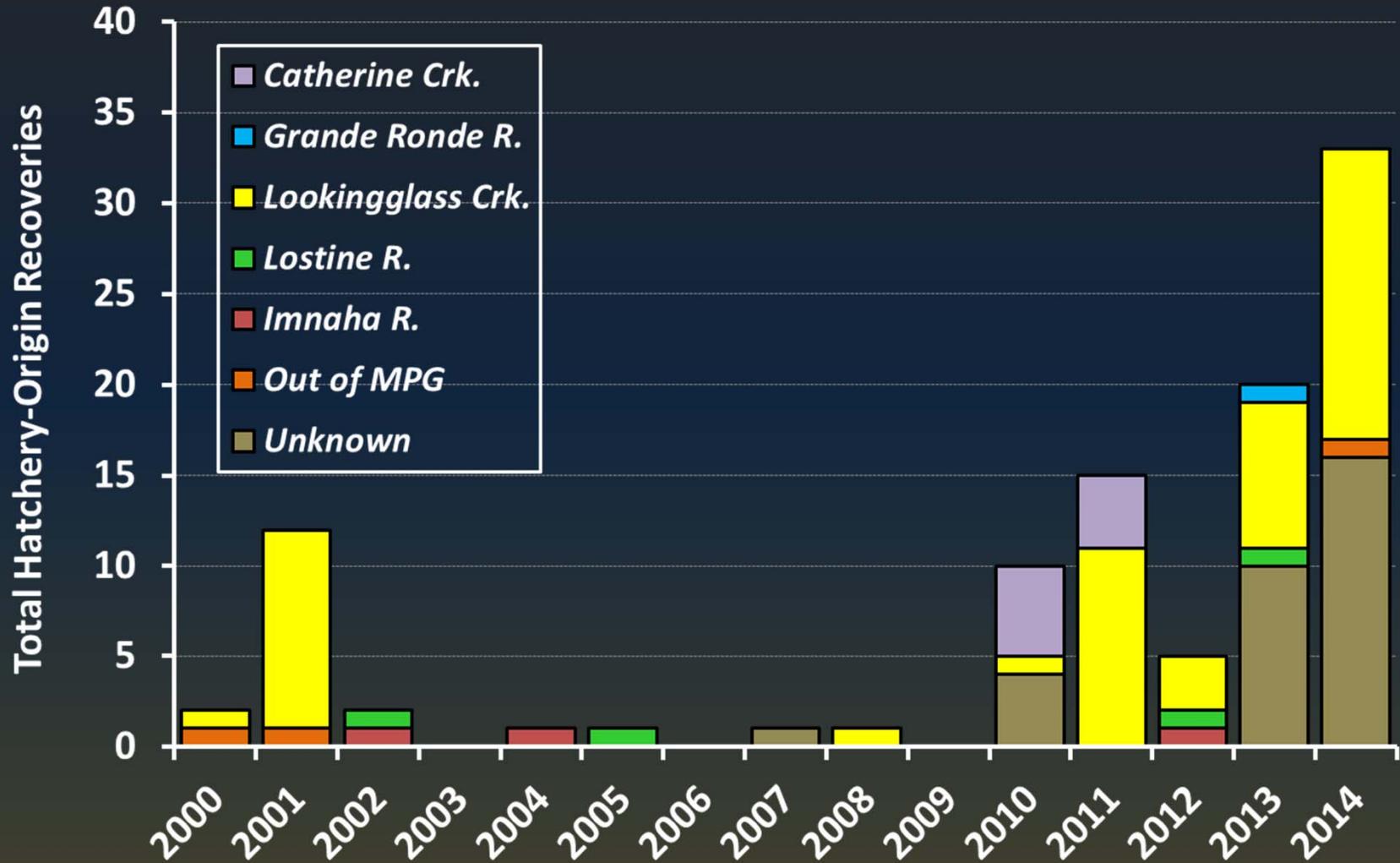
Hatchery Carcass Recoveries 2000-2014



Recoveries by Origin – Minam River



Recoveries by Origin – Wenaha River



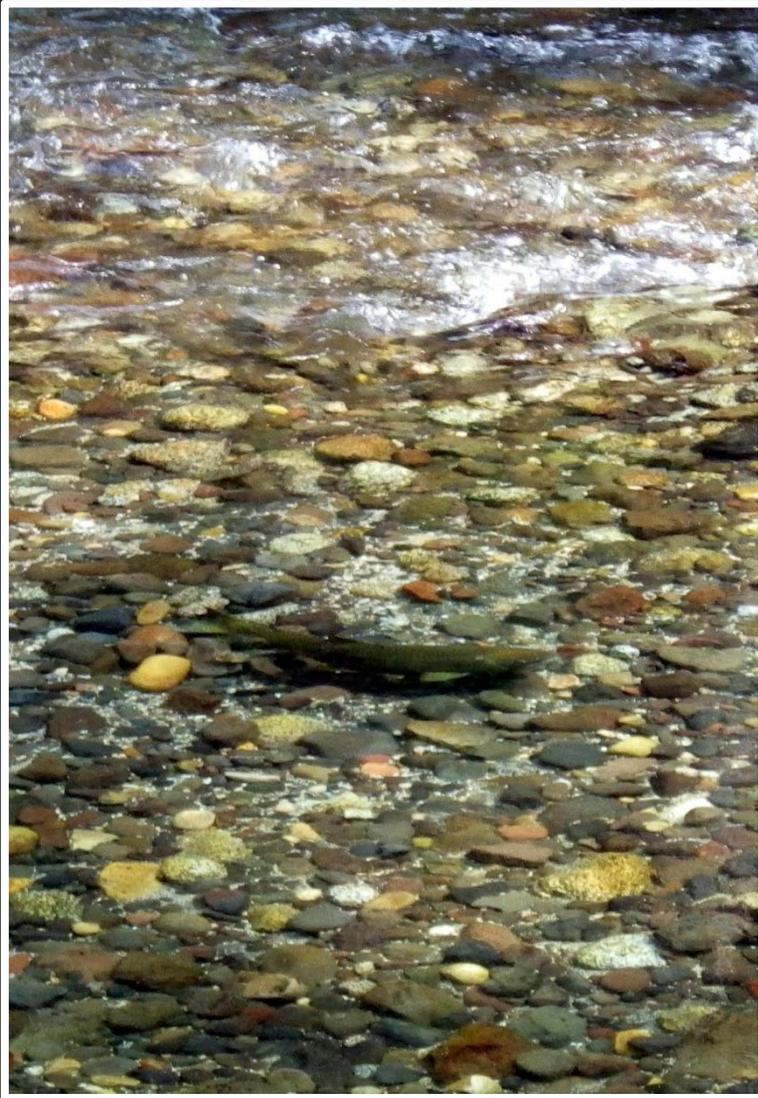
Results Summary

- Hatchery stray recoveries increased since 2009
 - Percent hatchery recoveries up 4-8X
 - Over 35% in Wenaha from 2013-14

	2000-2009	2010-2014
Minam	2.4%	10.8%
Wenaha	3.5%	26.8%

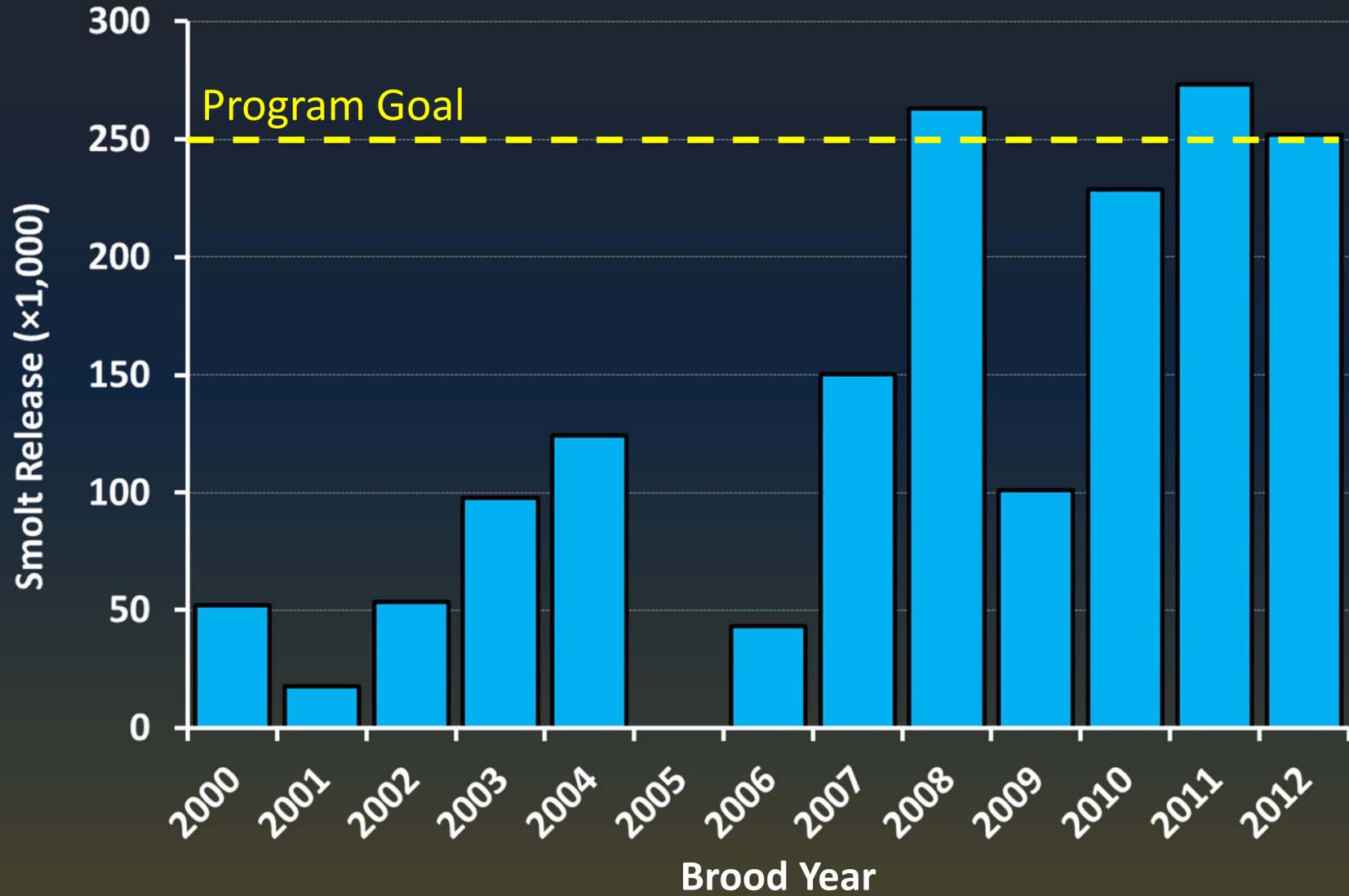
- Origin of Recoveries
 - Minam: Lostine River, Catherine Creek (2011)
 - Wenaha: Lookingglass Creek

Lookingglass Creek Component

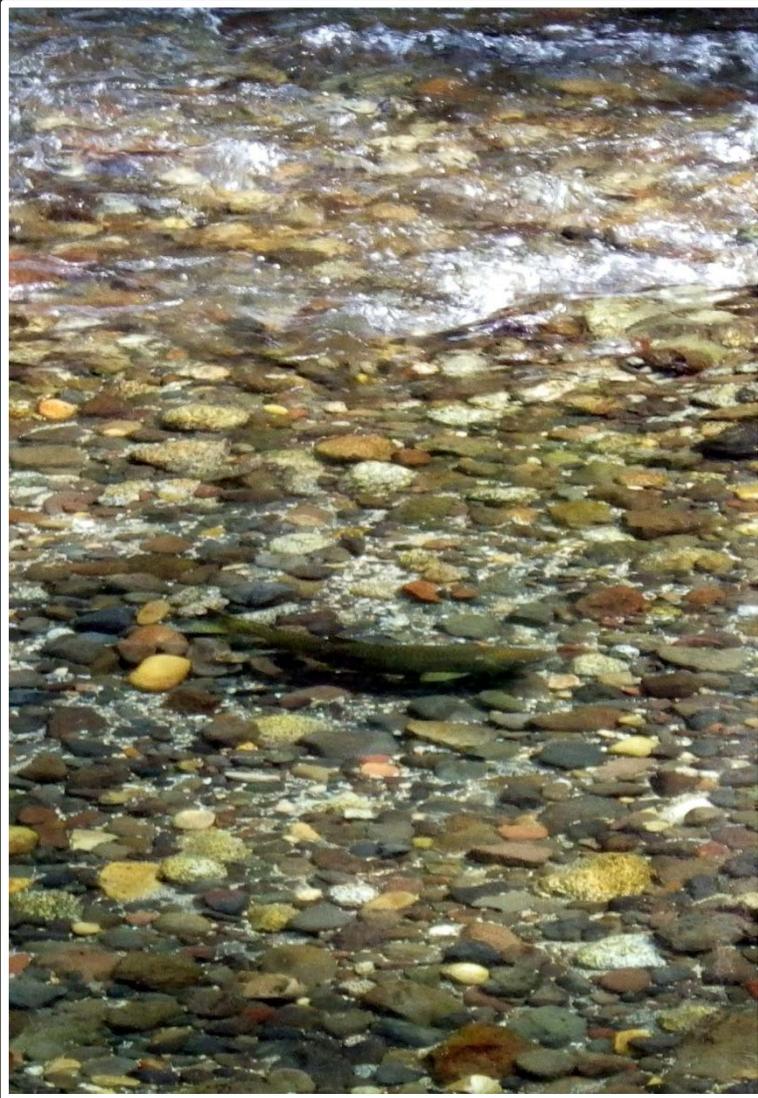


- Objectives
 - Tribal, sport harvest
 - Restore spring Chinook in Lookingglass Crk.
- Production
 - Over 200K released in BY 2008, and 2010-12

Lookingglass Smolt Releases



Lookingglass Creek Component



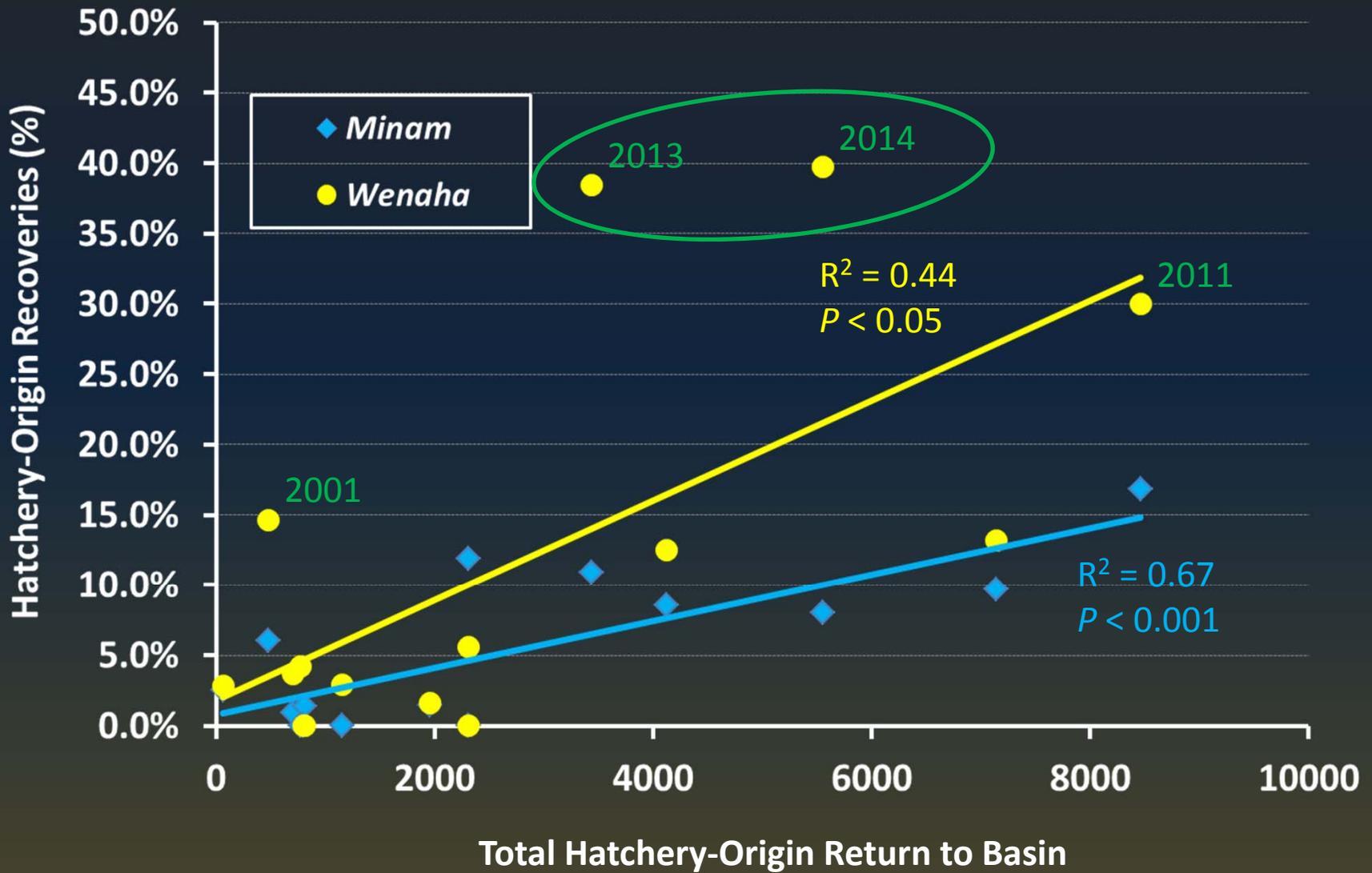
- Objectives
 - Tribal, sport harvest
 - Restore spring Chinook in Lookingglass Crk.
- Production
 - Over 200K released in BY 2008, and 2010-12
- Information needs
 - Brood year summaries
 - Review of management, rearing strategies

Causal Mechanisms?

- Contributing factors
 - Rearing practices
 - Fish management
 - Environmental
 - Water temps, chemistry
- Abundance
 - Do stray recoveries correlate with total returns of hatchery fish?



Stray Recoveries and Total H-O Returns



Causal Mechanisms?

- Contributing factors
 - Rearing practices
 - Fish management
 - Environmental
 - Water temps, chemistry
- Abundance
 - Do stray recoveries correlate with total returns of hatchery fish?
 - Yes, although Wenaha relationship driven by 2011, 2013-14 points



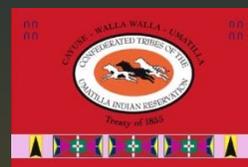
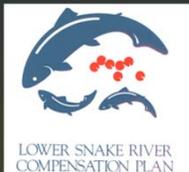
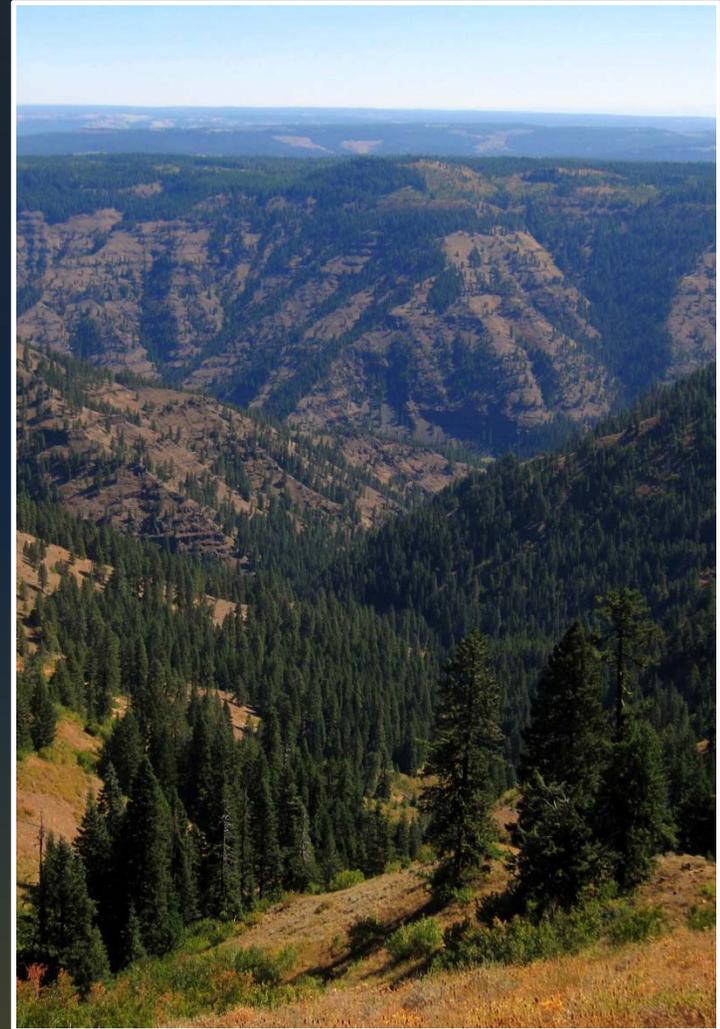
Where do we go from here?



- Coordination
 - Grande Ronde co-managers
 - WDFW - Wenaha tribes
 - LSRCP cooperators
- Analysis
 - Brood year summaries
 - Rearing practices
- Monitoring plan
 - Assess methodologies
 - More rigorous efforts?

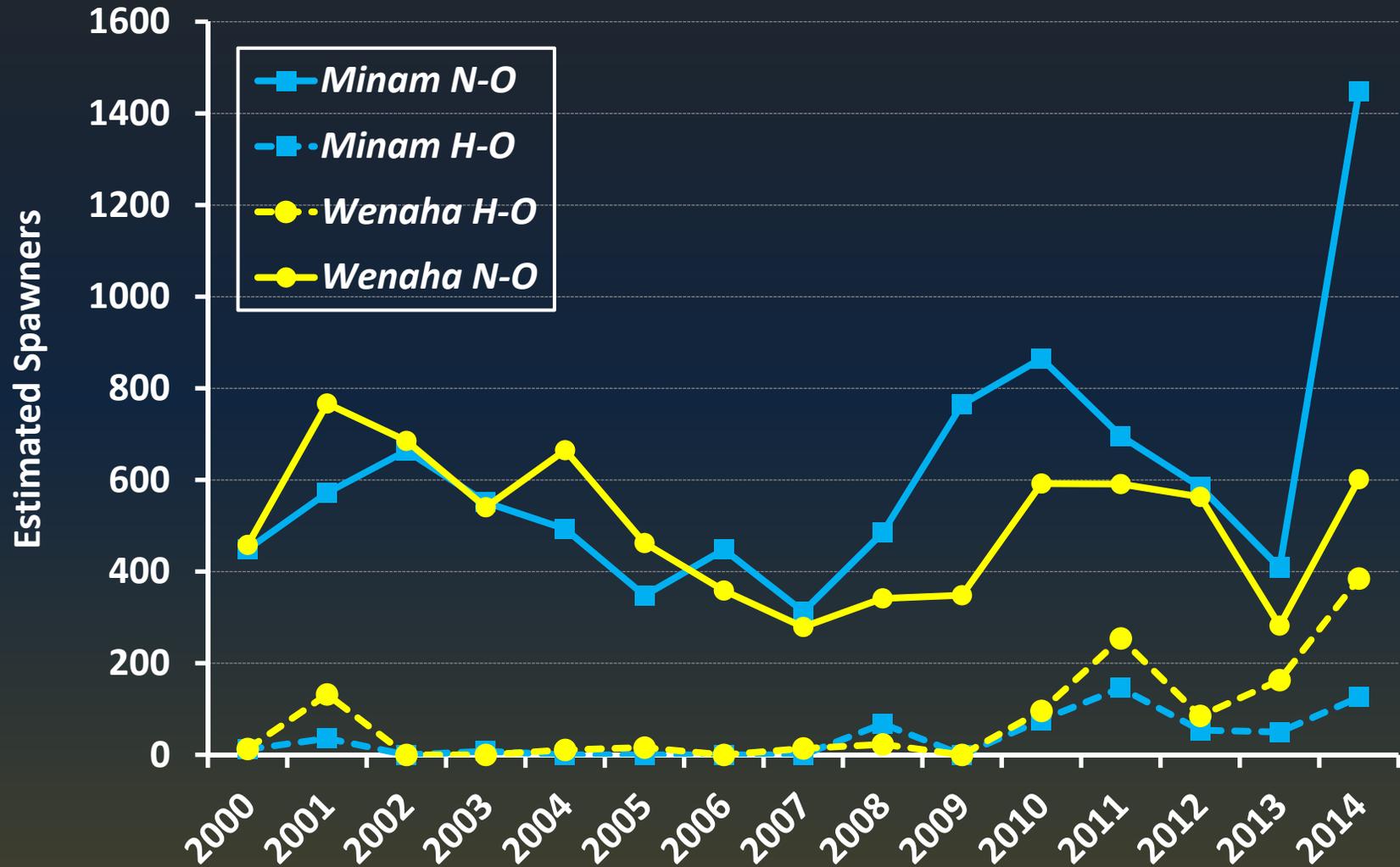
Acknowledgements

- Surveyors
- ODFW Wallowa and La Grande District Predecessors
- Logistics Team
 - The East Region ‘Herd’ and Packers
 - Joe Spence, Spence Aviation
- ODFW Fish Research staff (La Grande, Clackamas)
- Bears (for leaving samples, and not eating us)

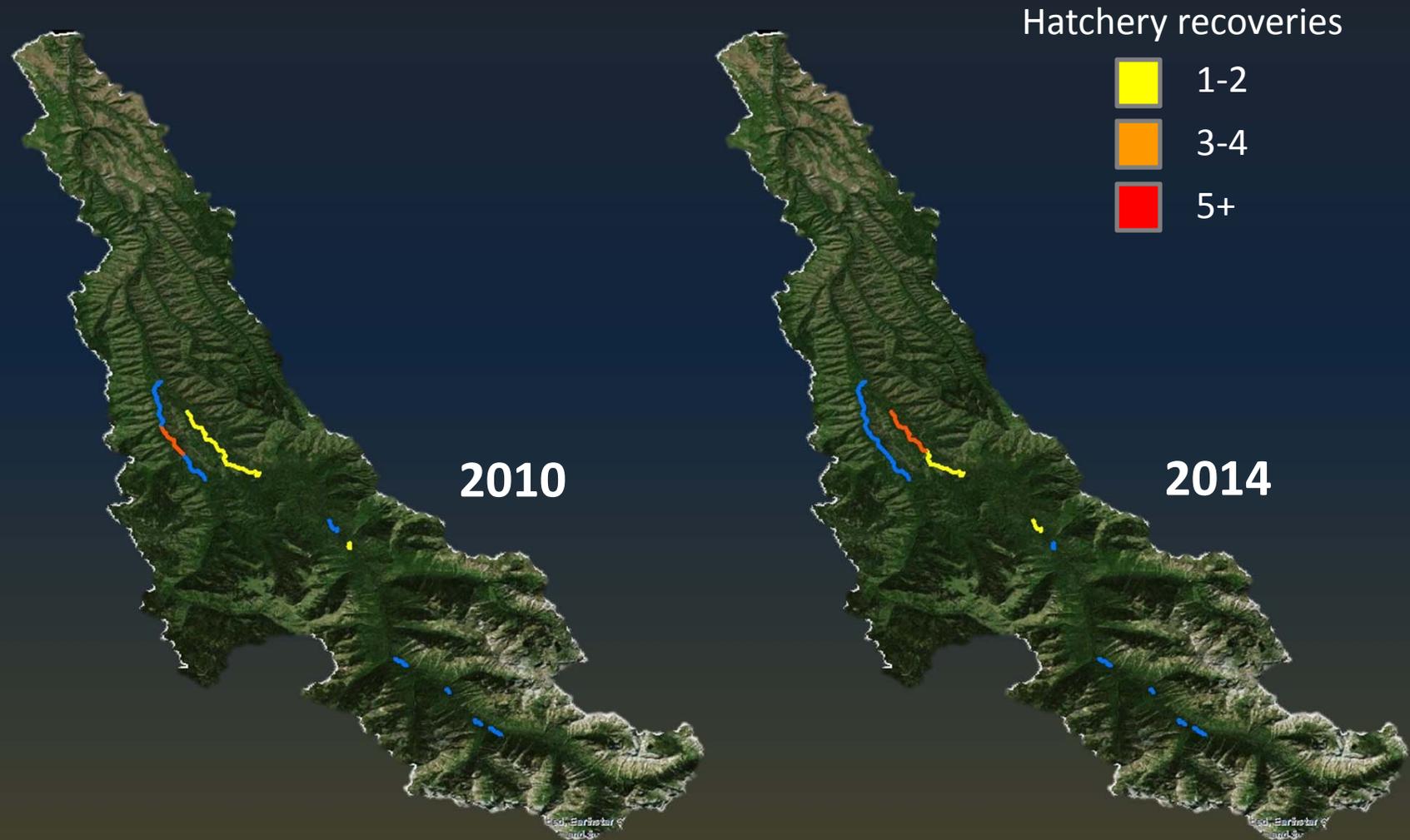




Estimated Spawners by Origin (inc. jacks)



Hatchery Carcass Distribution - Minam



Hatchery Carcass Distribution - Wenaha

