Columbia Basin Partnership
Workshop #1

Current Status of Listed ESUs

Tom Cooney (NWFSC)

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NOAA Five Year Status Reviews

- Two reports:
  - NWFSC: Biological Status update
    - Short term trends – common metrics across domains
      - Year to year variations in marine survivals a major factor
    - Status vs. viability/recovery objectives
      - Relative to specific recovery plan and/or TRT viability criteria
  - Northwest Regional Office: Update including limiting factors assessment

Biological Status Update

Data sources

- Formal assessment reports
- Regional Assessment biologists
- Ongoing research projects
- Regional & state level databases

State Fisheries Departments

- Idaho
- Oregon
- Washington

Tribal Fisheries Departments

- Nez Perce
- Shoshone-Bannock
- Umatilla
- Warm Springs
- Yakima
- Colville
- CRITFC

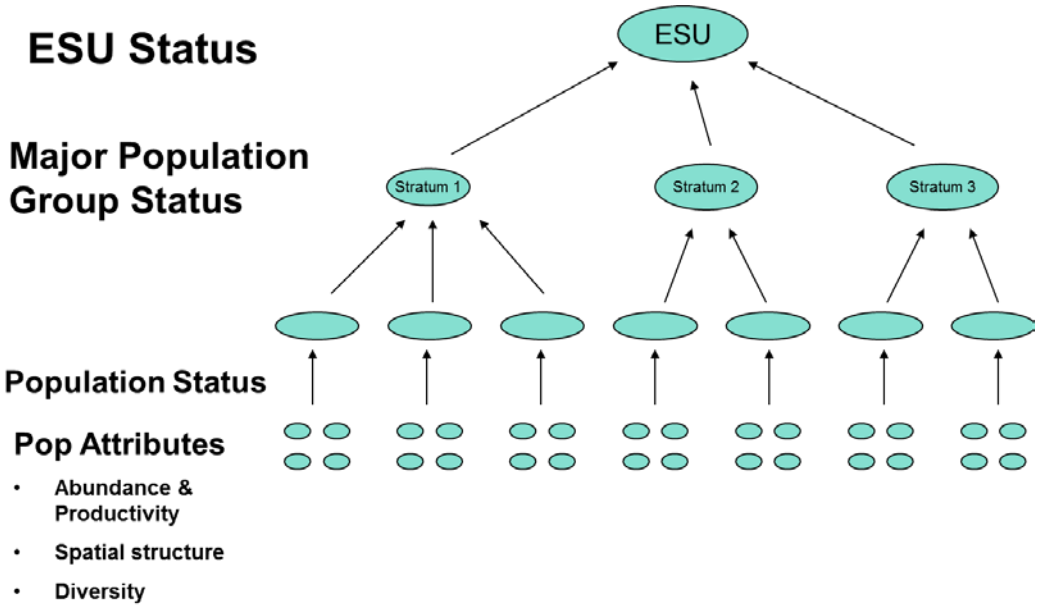
Federal agencies

- U.S. Fish and Wildlife Service
- U.S. Forest Service
- U.S. Geological Survey

ESU Level Criteria (hierarchical)

Major Population Groupings (MPGs)

- Minimum number of viable populations in each MPG
- Major life history patterns represented
- Historical population size representation
- Populations should not share the same exposure to particular catastrophic risks.

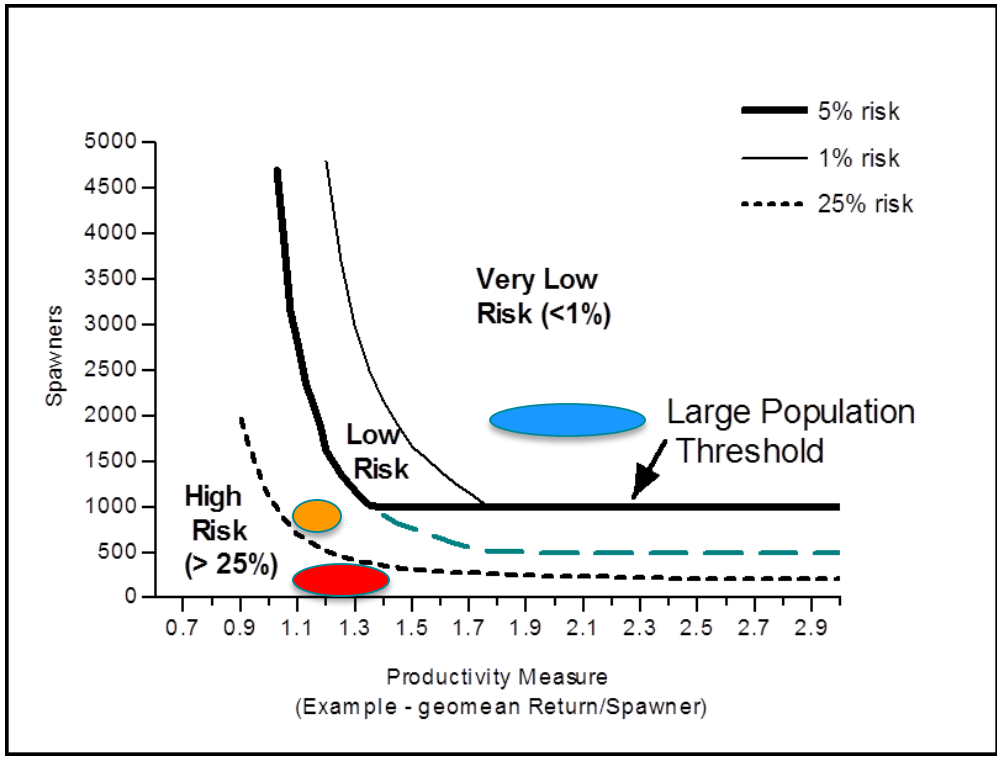


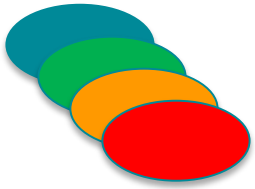
Population Level Criteria

- Abundance/Productivity
  - Viability curves
  - Minimum abundance thresholds
- Spatial Structure/Diversity
  - Spawning/rearing occupancy
  - Life history/traits
  - Genetic patterns
  - *Indirect measures*
    - *Hatchery effects*
    - *Selectivity*
    - *Ecoregions occupied*

Population Criteria

- Abundance and Productivity
  - Viability curves:
    - Minimum combinations of average abundance & productivity for a particular level of risk.
    - ESU/DPS specific, reflects typical year to year environmental variation
  - Minimum abundance thresholds
    - Provides for maintaining genetic characteristics, spatial structure





Current Population status

- Color = risk level
- Length = productivity uncertainty
- Height = abundance uncertainty

Viability Objectives

	Mechanisms (examples)	Viability benefits: MPG Level	Viability benefits: Population Level
Persistence Risk	Environmental variation (including autocorrelation)	Multiple low risk populations hedge against loss of any particular population, increases re-seeding potential	Addresses short term extinction risk
Catastrophic Risk	Landslides Severe freshet events Fire related impacts Etc.	Same as above	Spatial structure criteria result in production in multiple subwatersheds
Adaptability Risk	Longer term climate variation or change, environmental shifts	MPG viability scenarios result in low risk populations with a range of life history patterns and habitat adaptations	Meeting viability criteria for life history, traits and genetic indicators promotes natural adaptation

VSP Objectives vs. Historical

- POPULATION LEVEL
  Viability targets are set based on risk assessment
- Range between viable and potential represents policy choice
- Population recovery classifications specific to Lower Columbia River Recovery Plan, has been applied in other areas.

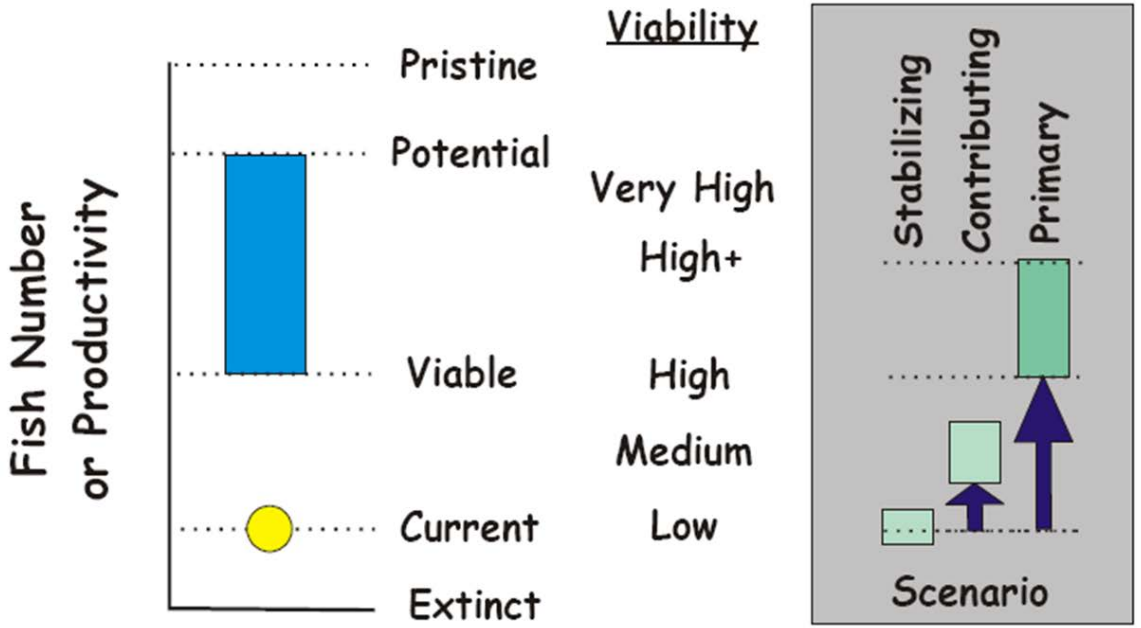
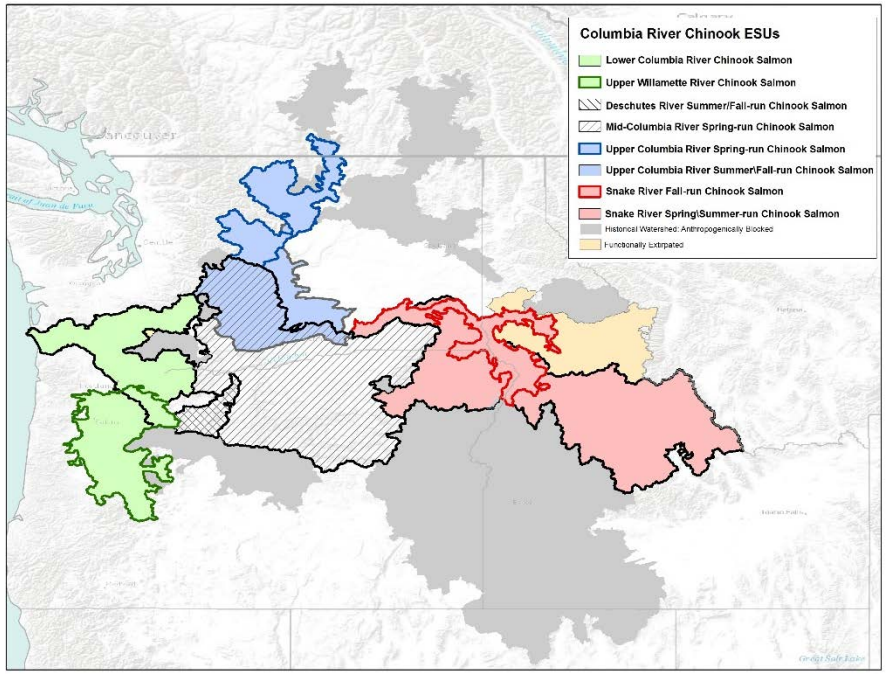


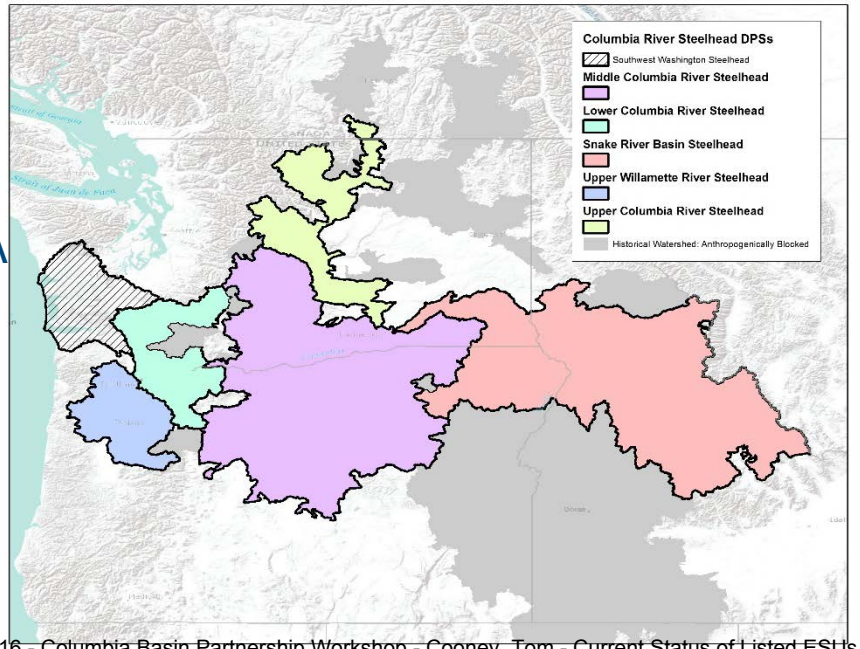
Figure 11. Schematic relating population abundance and productivity to viability levels identified by the Willamette/Lower Columbia Technical Recovery Team and population goals described by the recovery scenario.

ESU Maps

- Chinook
  - Eight ESUs in the Basin
  - Five listed under ESA
    - Upper Columbia Springs
    - Snake River Spring/Summer
    - Snake River Fall
    - Lower Columbia Spring/Fall
    - Upper Willamette



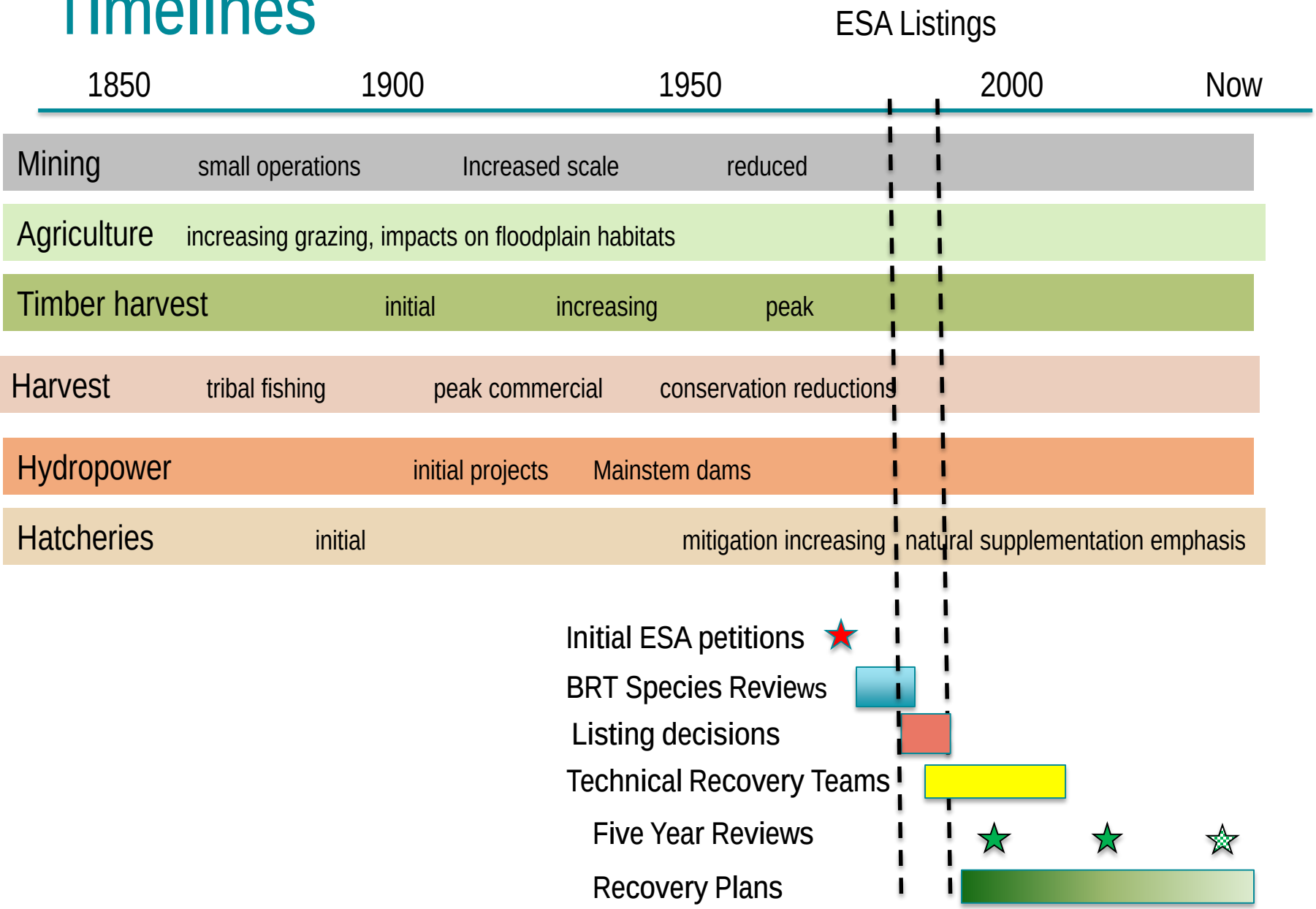
- Steelhead
  - Six DPSs in Basin
  - Five listed under ESA
    - Upper Columbia
    - Snake River
    - Middle Columbia
    - Lower Columbia
    - Upper Willamette



Also Listed:

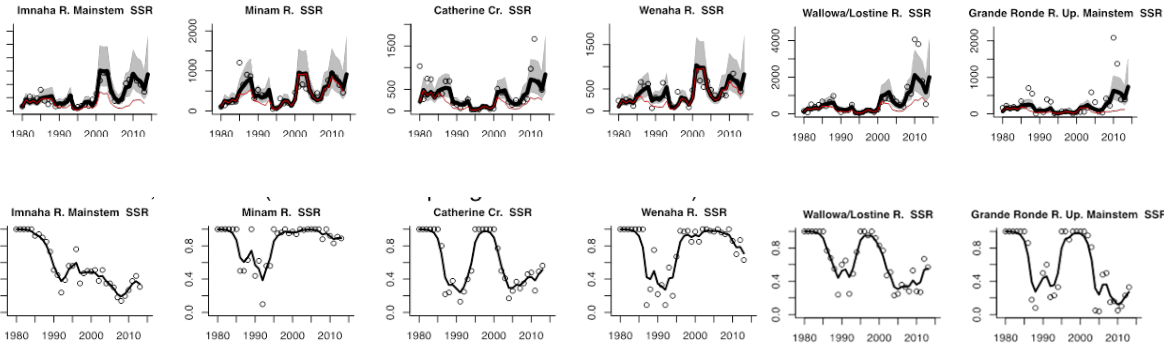
- Lower River Coho
- Lower River Chum
- Snake R. Sockeye

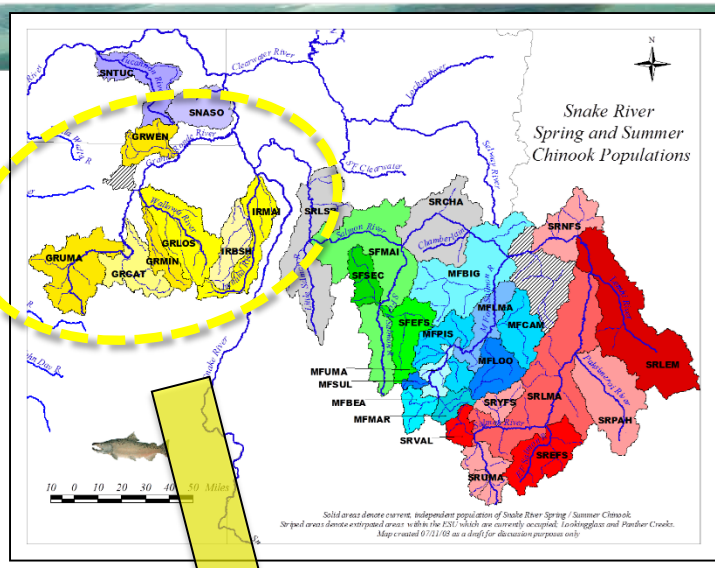
Timelines


ESA Listings
1850
1900
1950
2000
Now
Mining
small operations
Increased scale
reduced
Agriculture
increasing grazing, impacts on floodplain habitats
Timber harvest
initial
increasing
peak
Harvest
tribal fishing
peak commercial
conservation reductions
Hydropower
initial projects
Mainstem dams
Hatcheries
initial
mitigation increasing
natural supplementation emphasis
Initial ESA petitions
BRT Species Reviews
Listing decisions
Technical Recovery Teams
Five Year Reviews
Recovery Plans

Grande Ronde MPG

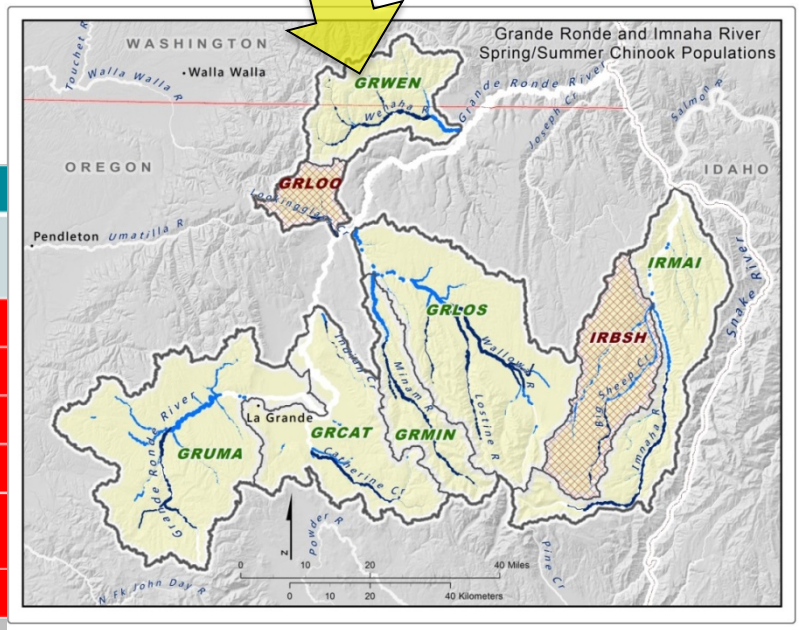
Trends (abundance & wild proportions)





VSP Status

	Current Trends		Viability Ratings			
Population	**Abundance**	**Productivity**	**A/P Rating**	**Spatial Structure**	**Diversity**	**Viability Rating**
Wenaha R.	Decreased	Improved	Hi Risk	Low Risk	Moderate	Hi Risk
Minam R.	Improved	Improved	Hi Risk	Low Risk	Moderate	Hi Risk
Lostine/Wallowa	Improved	Improved	Hi Risk	Low Risk	Moderate	Hi Risk
Catherine Cr.	Improved	Improved	Hi Risk	Moderate	Moderate	Hi Risk
Upper Grande Ronde	Improved	Improved	Hi Risk	Hi Risk	Moderate	Hi Risk
Imnaha	Improved	Improved	Hi Risk	Low Risk	Moderate	Hi Risk
Big Sheep (ext)	-	-	-	-	-	-
Lookingglass (ext)	-	-	-	-	-	-



Snake River Spring/Summer Chinook MPG: Current Status

	Current Trends		Population Factors Status									Rating
MPG	Abundance	Productivity		1	2	3	4	5	6	7	8	9	
Lower Snake River	1 +	1 -	A&P SS D										NV
Grande Ronde-Imnaha	6 +	5+ 1-	A&P SS D										NV
South Fork Salmon R.	3 +	1 + 1 nochg 1 -	A&P SS D										NV
Middle Fork Salmon R.	6 + 1 -	1 + 7 -	A&P SS D										NV
Upper Salmon R.	6 + 1 -	6 + 1 -	A&P SS D										NV

Although some improvement, most populations remain at high risk

1 population (Chamberlain Creek) improved to 'Maintained' (driven by increased abundance)

Considerable variation across populations in gaps to viability

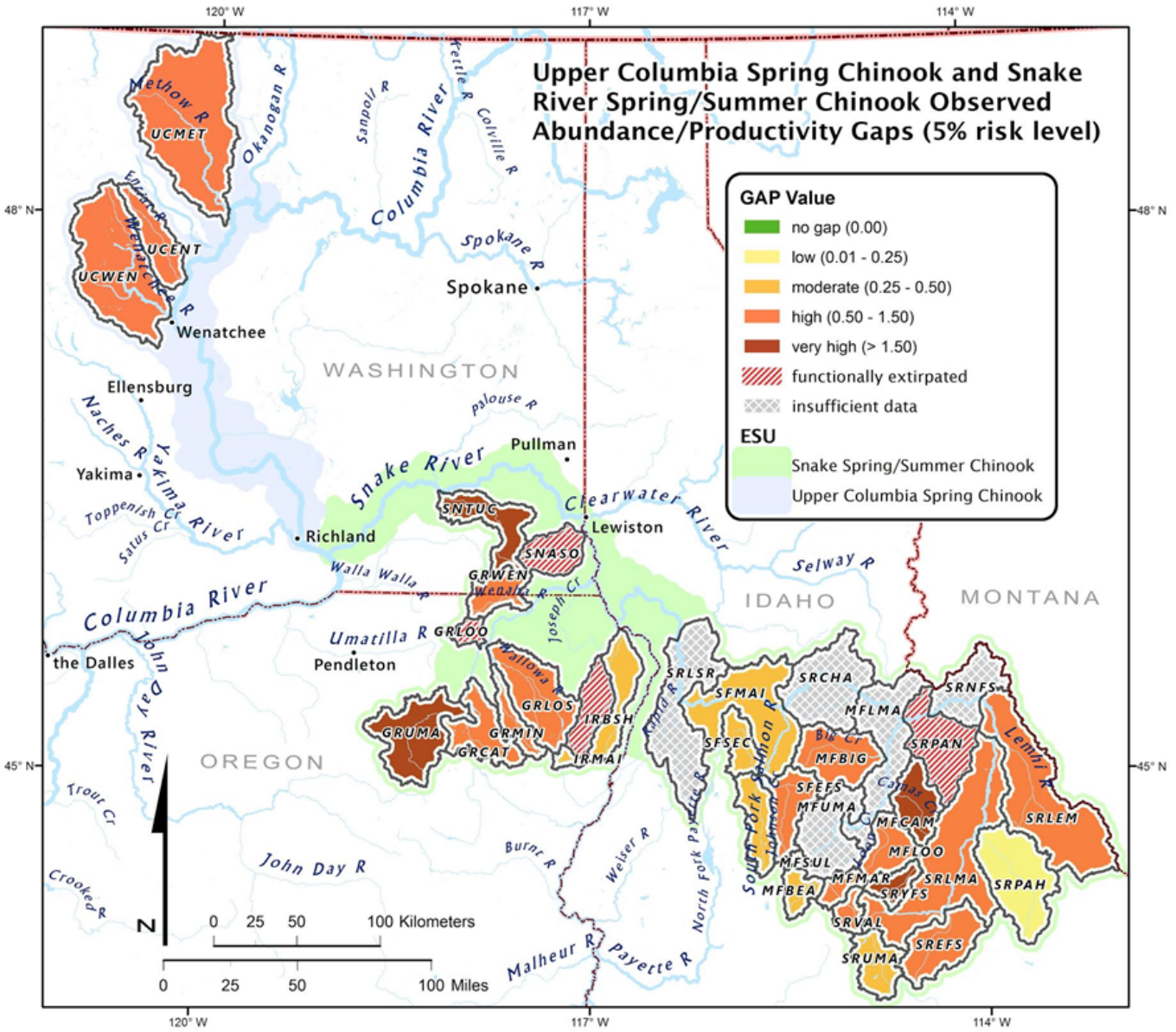
South Fork populations generally have the smallest viability gaps

Upper Grande Ronde, Catherine Creek, Tucannon have the largest remaining gaps

Lower Snake, Lower Grande Ronde, Chamberlain Creek, Imnaha have the largest remaining gaps

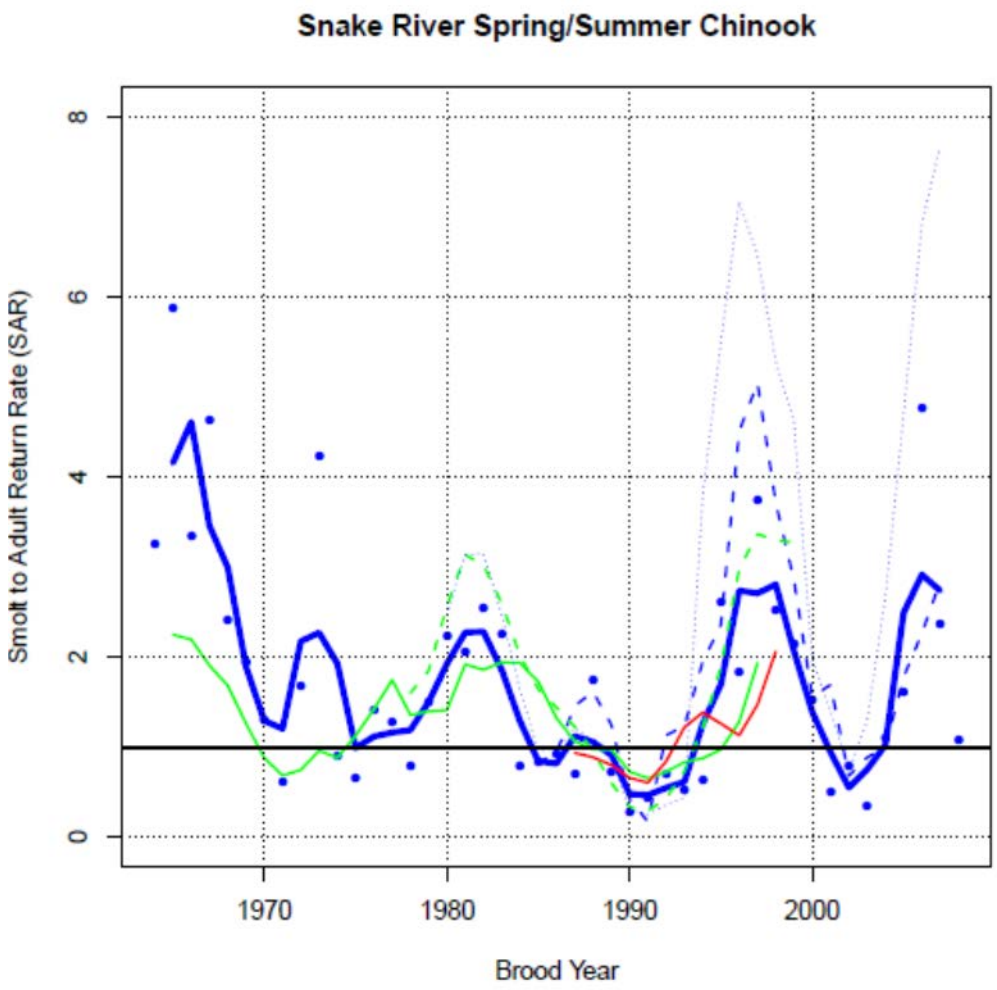
- All Interior Spring and Spring/Summer populations are at HIGH A&P risk
- However, GAPs (survival/capacity increase) to low risk vary considerably among populations

- South Fork MPG populations smallest gaps
- Variable for other MPGs



Environmental Variation

- Changes in abundance between 5 year reviews dominated by annual ocean survival patterns
- Although there is a lot of annual variability, there are strong common patterns across ESUs and DPSs.
- Population persistence depends on having sufficient resilience (e.g. productivity and capacity) to counter this variation.



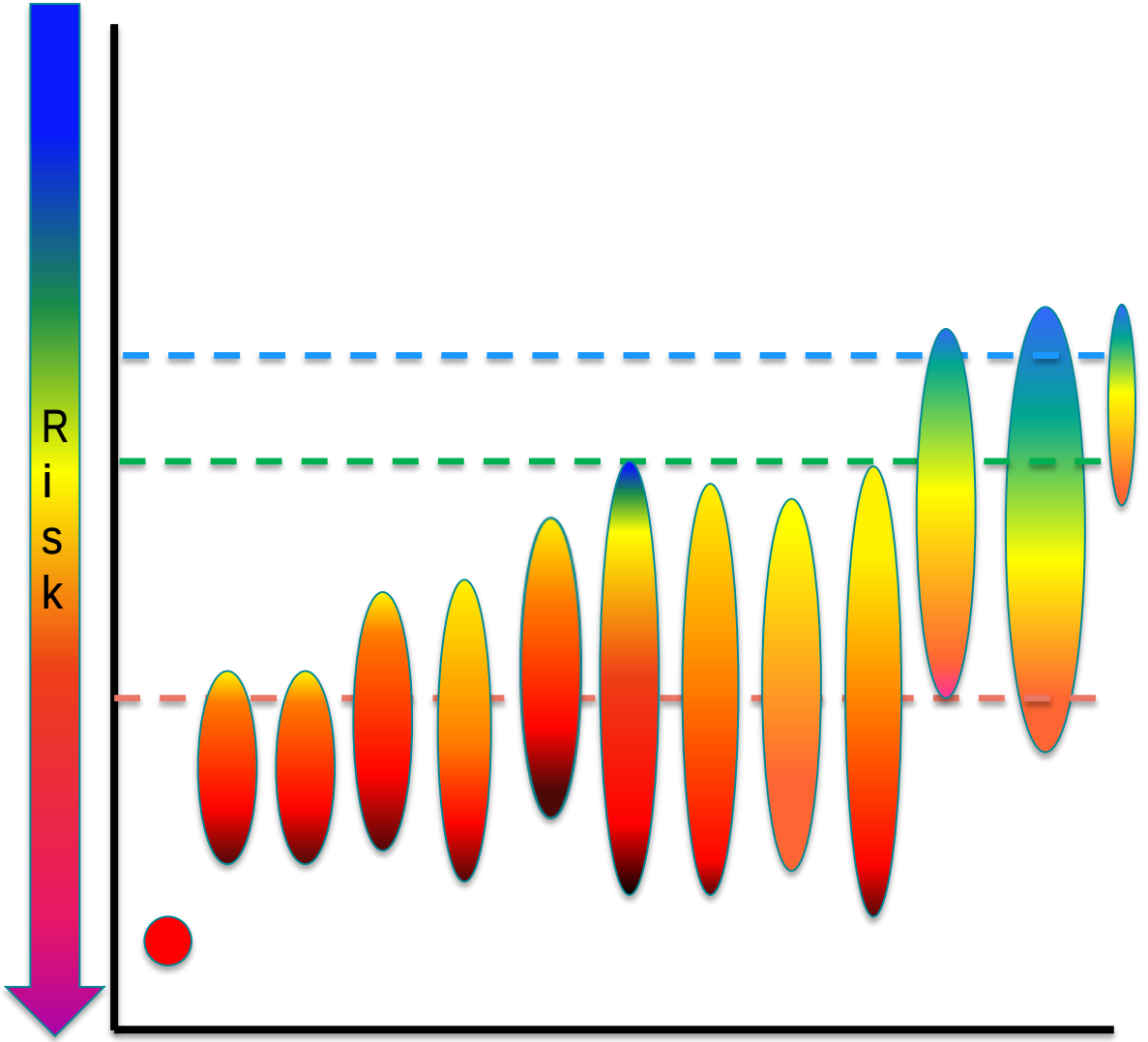
Draft NWFSC Five Year Review compiled from multiple sources

Listed Chinook ESUs

ESU	MPGS & Populations	Short term trends	Recovery Status (VSP)	New Information
Lower Columbia Chinook	3 MPGs, 20 populations	Increased natural abundance for ~70% of fall run populations	Improvements but populations still well below recovery targets. Spring runs at Hi risk except for Sandy River (remains at moderate)	Major improvements in estimating spawning abundance, hatchery/wild proportions. Some populations have lower total spawners than previously estimated
Upper Willamette Spring Chinook	Check, 4 extant, 1 ext??	No. & So. Santiam populations increased, Sandy and McKenzie decreased	All populations remain well below Rec. Plan objectives. Populations remain restricted to lower reaches of historical production areas	Substantial prespawning mortality in several recent years
Upper Columbia Spring	1 MPG, 3 extant populations	Increases in abundance (3/3) and productivity (2/3) populations. Increased hatchery proportions	Improvements but all below Rec. Plan objectives. Spatial structure low risk but diversity risks are high due to ongoing supplementation, straying.	Study results: Upper Columbia populations displayed unique pattern in annual survivals relative to other spring chinook populations in the Interior.
Snake River Spring/Summer	5 MPGs, 21 extant populations	Natural origin abundance increased. Spatial and diversity unchanged	Majority of populations remain at high risk (Chamberlain Cr. improved to Moderate). Variation in gaps to viable status across populations.	Strong evidence of freshwater density dependent effects. Downstream rearing patterns identified for many populations. High overshoot rates for Tucannon pop.
Snake River Falls	1 MPG, 1 extant population (2 historical)	Increased natural and hatchery origin spawners	Moderate risk, uncertainty regarding productivity, longer term effects of chronic high hatchery proportions	Improved abundance estimates, life history pattern info, ocean survival index, strong support for density dependence at high spawning levels.

Current Natural Production Status

- Considerable range in ESU/DPS level status vs. natural persistence and sustainability objectives
- Sockeye: No functioning natural population, initial reintroductions using anadromous hatchery returns from local residual broodstock.
- Snake River Fall Chinook: significant increases in natural origin abundance, uncertainties remain regarding long term sustainability
- Mid-Columbia Steelhead: not meeting MPG criteria but some low and moderate risk populations across MPGs



TDC note: 5/10/16 added missing 'oval' representing Lower Col. Chinook ESU after the presentation

Steelhead DPSs

ESU	MPGS & Populations	Short term trends	Recovery Status (VSP)	New Information
Lower Columbia Steelhead	3 MPGs 23 pops.	Increases in abundance for several populations. Downturn in Wind R., possibly due to short term effects.	Status generally improved, but abundances remain low compared to viability targets.	Improved methods & standardization for adult monitoring programs.
Upper Willamette Steelhead	1 MPG 4 pops.	Declines continued in recent years. Large scale hatchery releases complicate estimation of natural returns	Status continues to decline relative to viability targets for individual populations. Historically productive upper tributary sections blocked by dams.	Radio tagging indicates substantial numbers of returning steelhead are going to areas outside of historical population habitats..
Middle Columbia Steelhead	4 MPGs 16 pops. *(8 ext.)*	Majority of populations increased in natural origin abundance.	Majority remained at prior ratings. So. Fork John Day improved to viable. No MPGs met viable status, each contains a mix of low, moderate and high risk populations.	Improved abundance estimates for Yakima pops. Recent studies indicate Fifteen Mile Cr. is predominately summer run, outside stray proportions in John Day reduced ; pit tag analyses support high levels of overshoot of natal tributaries for some populations.
Snake River Steelhead	4 MPGs *(4 ext.)* 23 pops.	Average DPS natural origin return higher than prior review, high annual variability.. Uncertainty regarding hatchery/wild proportions for most pops in upper section of Salmon MPG continues.	Generally improved, Grande Ronde and Clearwater MPGs include some viable populations. Ocean conditions, improved monitoring contribute to status updates.	Additional basin-wide monitoring efforts have significantly improved status information. VSP status of populations likely driven more by elevation/geographic patterns than simple A vs. B. designations.
Upper Columbia Steelhead	1 MPG *(2 ext.)* 4 pops. *(1? ext.)*	Natural origin Increases continued, but at a lower rate. Hatchery proportions remain at high levels.	Wenatchee R. population exceeded moderate risk criteria for abundance/productivity, but remained at high risk for diversity. Other populations remain at high risk relative to viability criteria.	Updated approach for estimating population specific abundance and hatchery/wild composition promising, combines sstematic pit tag based evaluations of annual returns, population specific monitoring.

Coho, Chum and Sockeye ESUs

ESU	MPGS & Populations	Short term trends	Recovery Status (VSP)	New Information
Lower Columbia Coho	3 MPGs 25 historical populations	VSP trends positive, may reflect improved monitoring	Recovery efforts likely have contributed to improvements for many populations remain at moderate or high risk.	New population level monitoring efforts identified natural production in many populations
Lower Columbia Chum	3 MPGs 16 historical populations	Grays River, Washougal & Big Cr. increased, remaining pops unchanged or decreased.	Viability status unchanged since last review. Majority of populations at high to very high risk due to low abundances, Grays River population rated low risk, Washougal and Lower Gorge remain at moderate risk.	Expanded monitoring efforts in recent years. Natural brood supplementation efforts initiated in Big Creek.
Snake River Sockeye	1 MPG 1 (remnant) pop. ~4 extirpated??	Increased anadromous returns from natal broodstock hatchery program	Genetic protection phase, initiating reintroduction phase.	2015: migration blockages and mortalities (high temperatures) Three phased recovery effort developed