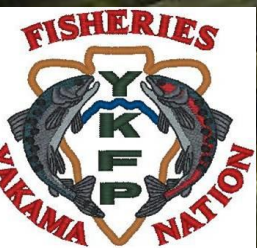


Yakima River Steelhead VSP Project: Status and Trends Update

Chris Frederiksen¹, Zack Mays¹, and Gabriel Temple²

¹Yakama Nation Fisheries - YKFP

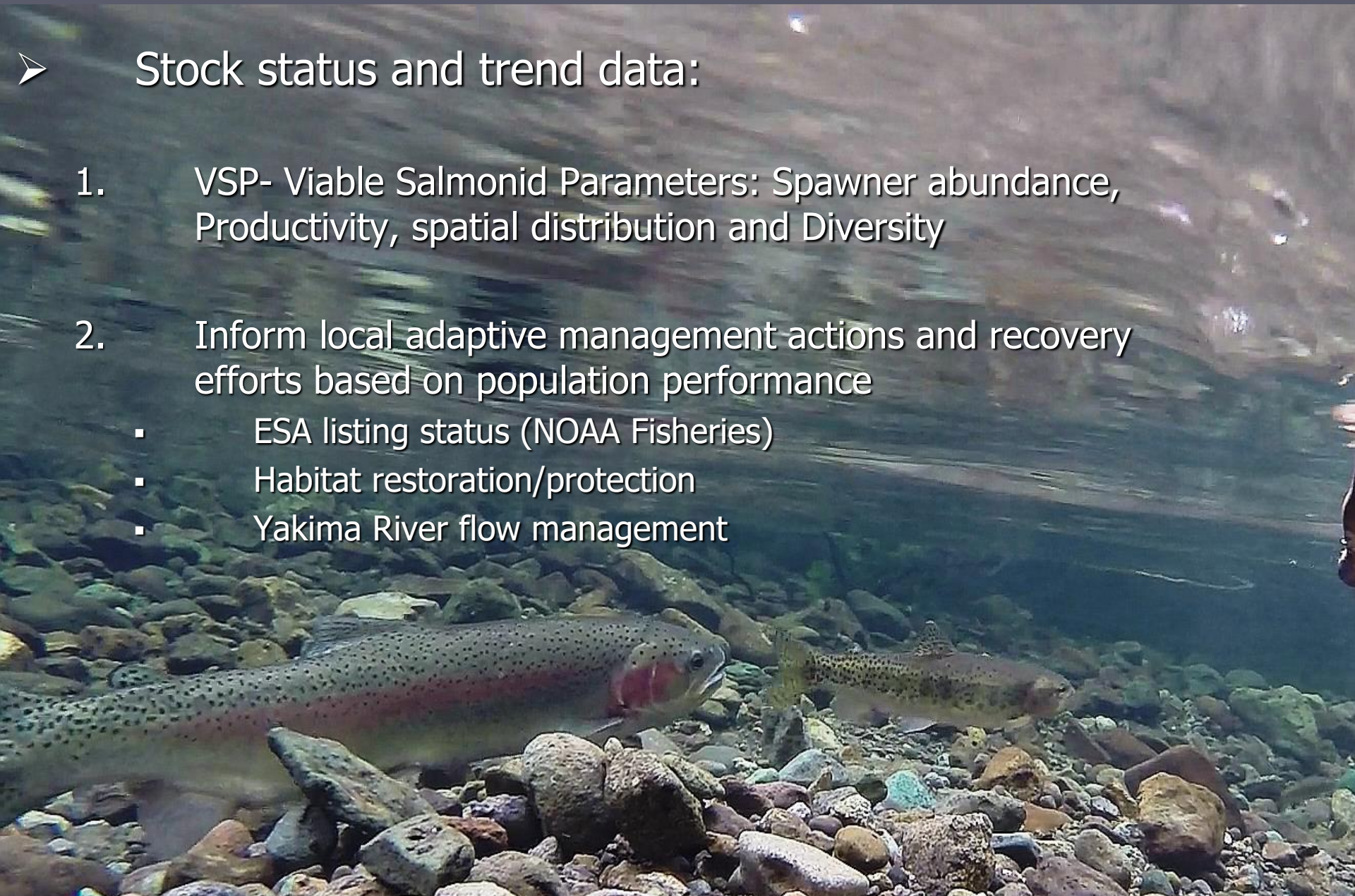
²Washington Department of Fish and Wildlife



Yakima River Steelhead Status and Trends Update

➤ Stock status and trend data:

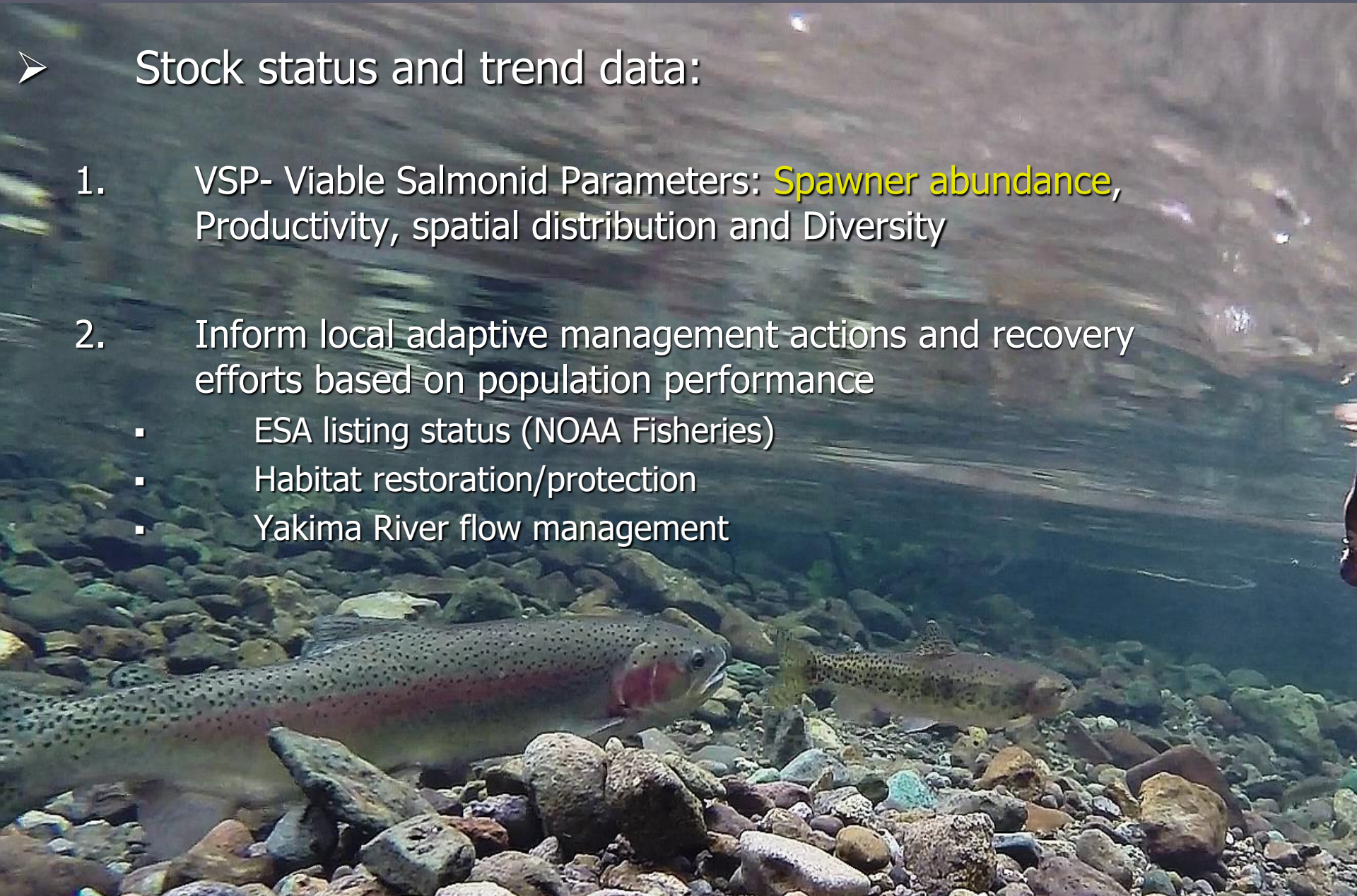
1. VSP- Viable Salmonid Parameters: Spawner abundance, Productivity, spatial distribution and Diversity
2. Inform local adaptive management actions and recovery efforts based on population performance
 - ESA listing status (NOAA Fisheries)
 - Habitat restoration/protection
 - Yakima River flow management



Yakima River Steelhead Status and Trends Update

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Yakima River Summer Run Steelhead

Populations

upper Yakima R.

Gmean: 51

Gmean: 221

Naches R.

Gmean: 271

Gmean: 994

Toppenish Cr.

Gmean: 117

Gmean: 461

Satus Cr.

Gmean: 300

Gmean: 817

Yakima River steelhead status

- 1999 Mid Columbia DPS listed as threatened

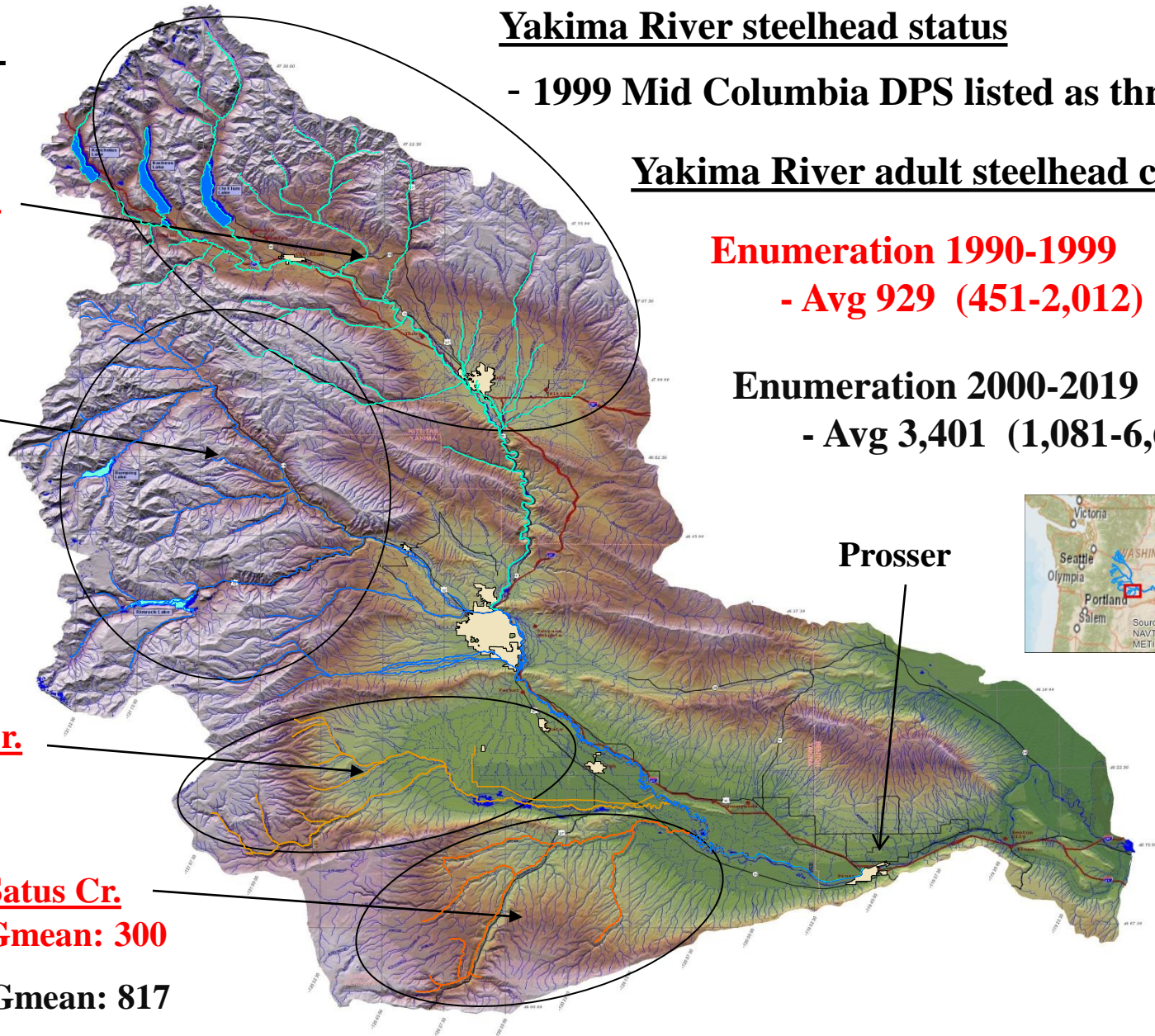
Yakima River adult steelhead counts

Enumeration 1990-1999

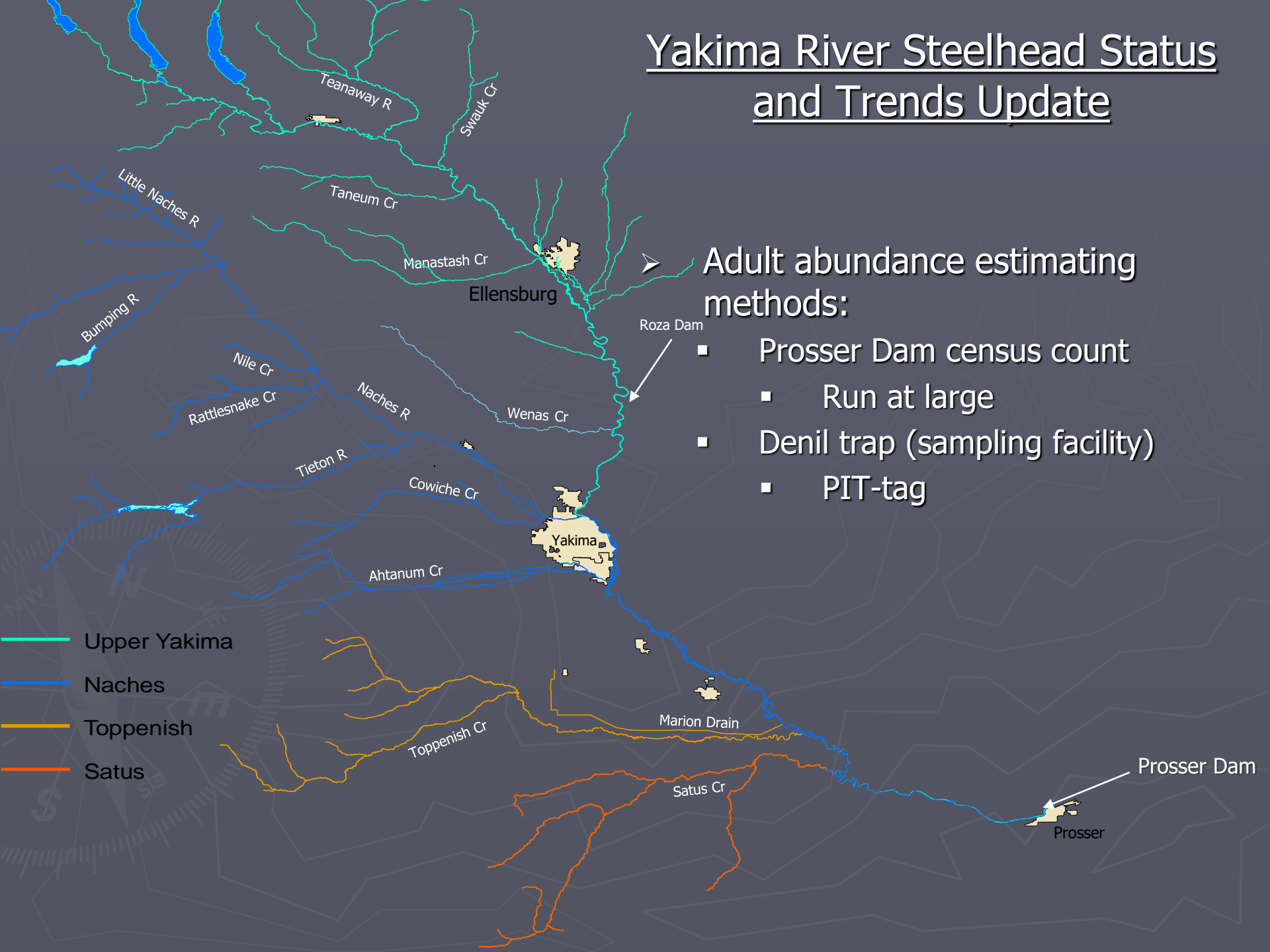
- Avg 929 (451-2,012)

Enumeration 2000-2019

- Avg 3,401 (1,081-6,602)



Yakima River Steelhead Status and Trends Update



Teanaway R

Swauk Cr

Little Naches R

Taneum Cr

Manastash Cr

Ellensburg

Roza Dam

Bumping R

Nile Cr

Rattlesnake Cr

Naches R

Wenas Cr

Tieton R

Cowiche Cr

Yakima

Ahtanum Cr

Marion Drain

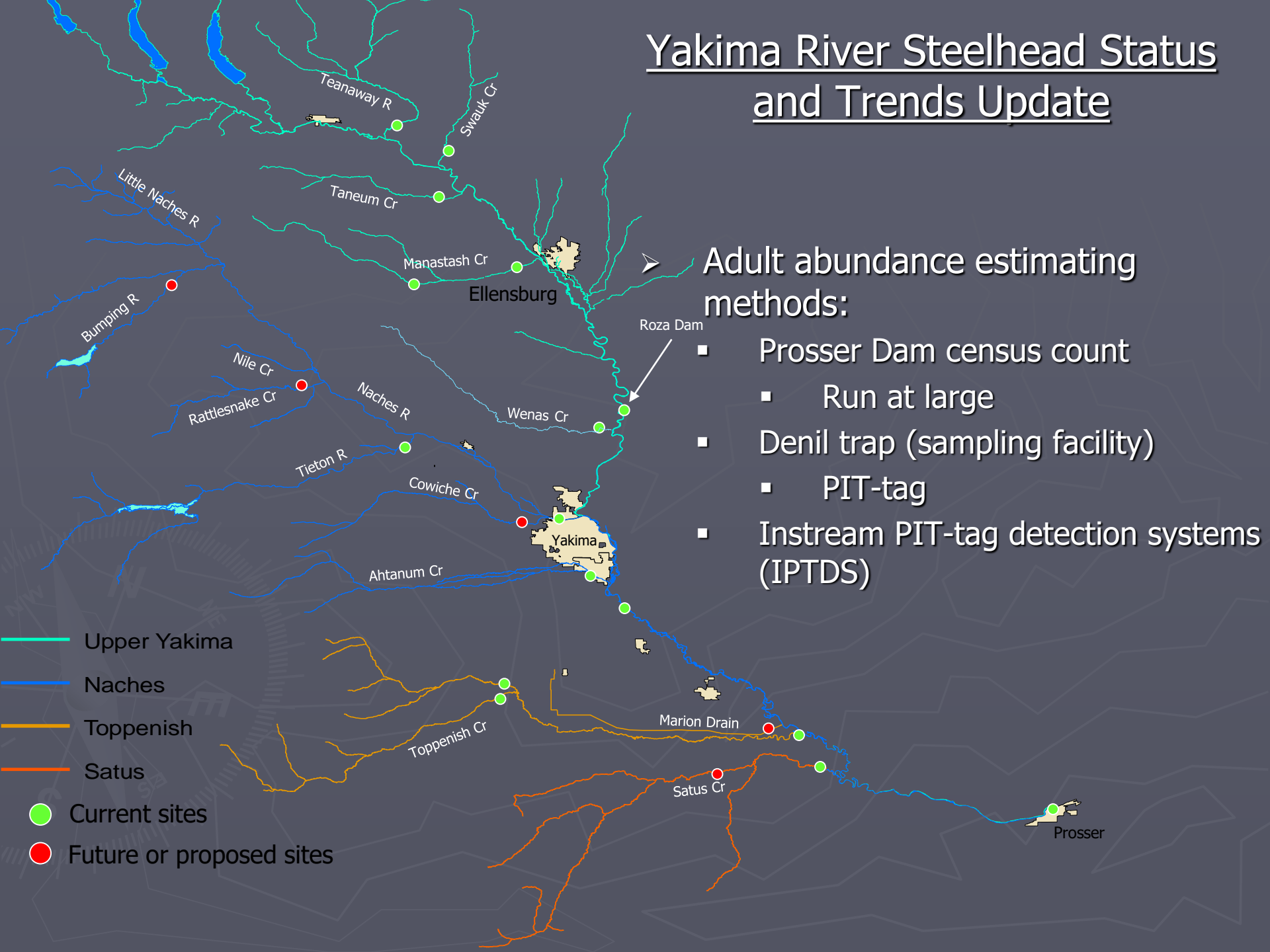
Toppenish Cr

Satus Cr

Prosser Dam

Prosser

Yakima River Steelhead Status and Trends Update



Adult abundance estimating methods:

- Prosser Dam census count
 - Run at large
- Denil trap (sampling facility)
 - PIT-tag
- Instream PIT-tag detection systems (IPTDS)

Upper Yakima

Naches

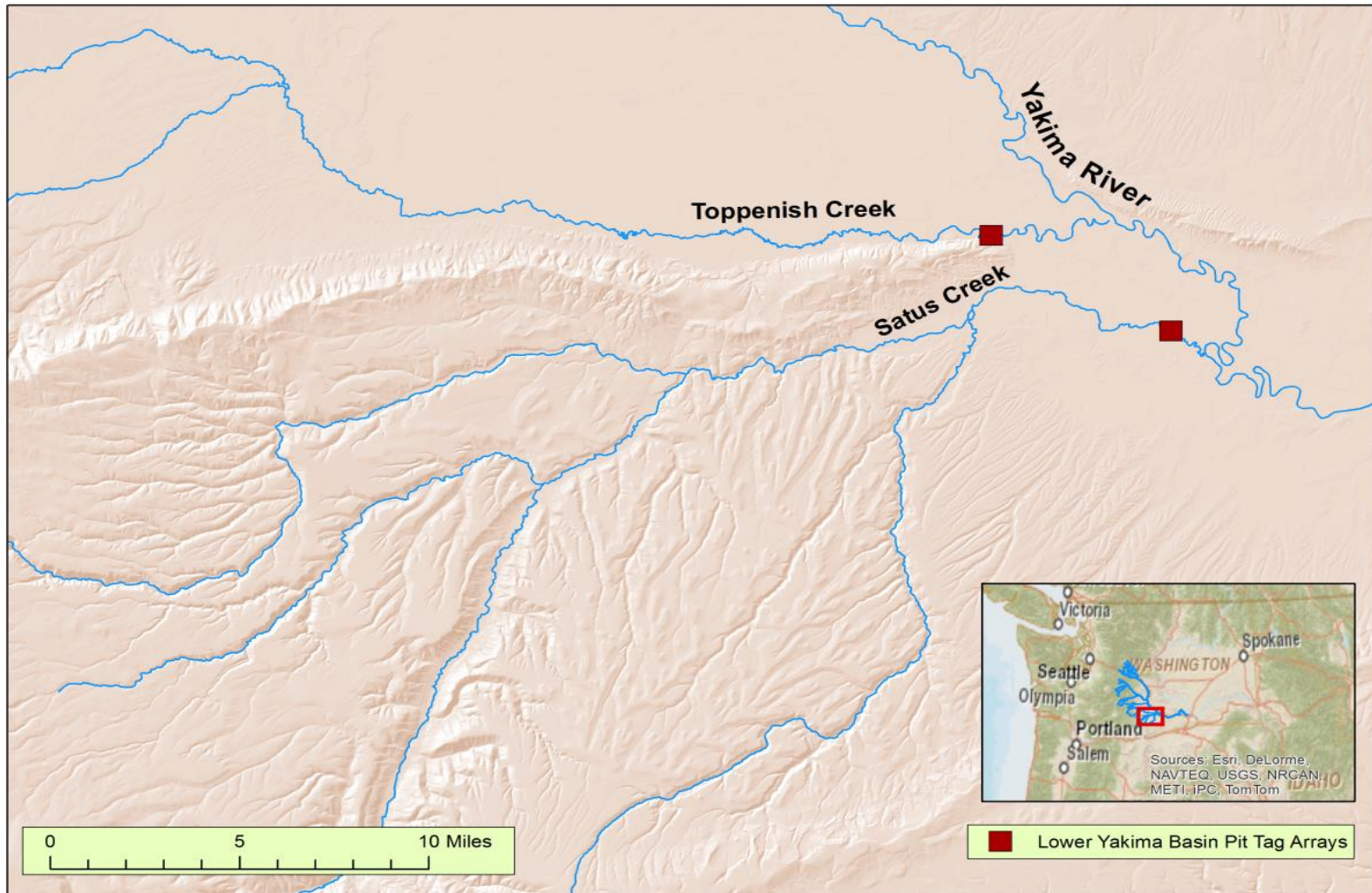
Toppenish

Satus

● Current sites

● Future or proposed sites

Yakima River Instream PIT-Tag Detection System (IPTDS) Feasibility Sites



Satus & Toppenish Cr. IPTDS: 2012-2014 Detection Efficiencies

Satus Cr Instream PIT-tag Detection Array			
Year	Total # of double tagged sthd detected	# of Detected PIT-tags	Instream Array detection efficiency
2012	159	154	96.86%
2013	102	101	99.02%
2014	113	105	92.92%
AVG			96.27%

Toppenish Cr Instream PIT-tag Detection Array			
Year	Total # of double tagged sthd detected	# of Detected PIT-tags	Instream Array detection efficiency
2012	48	48	100.00%
2013	46	45	97.83%
2014	34	31	91.18%
AVG			96.33%

Satus Creek

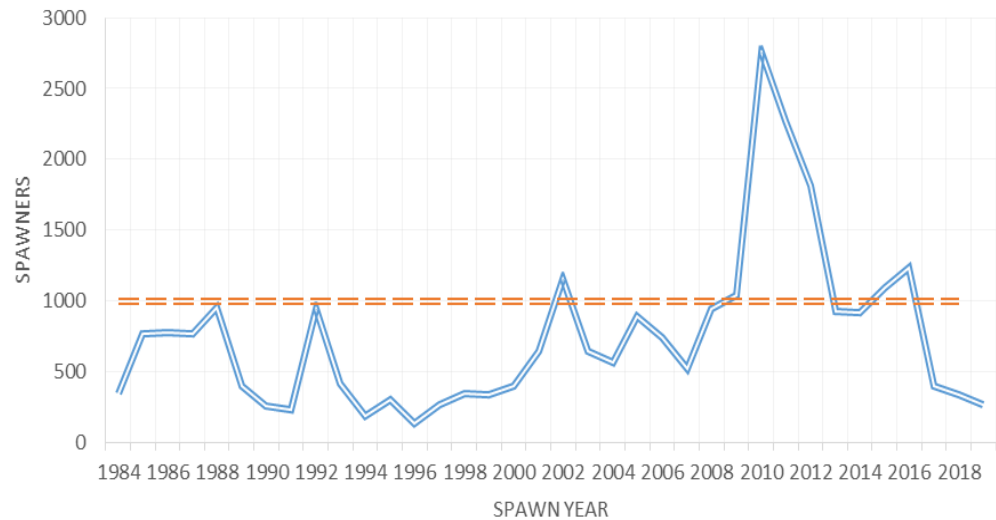
Dry Cr

Logy Cr

Mule Dry Cr

2017 – 400 spawners
2018 – 341 spawners
2019 – 269 spawners

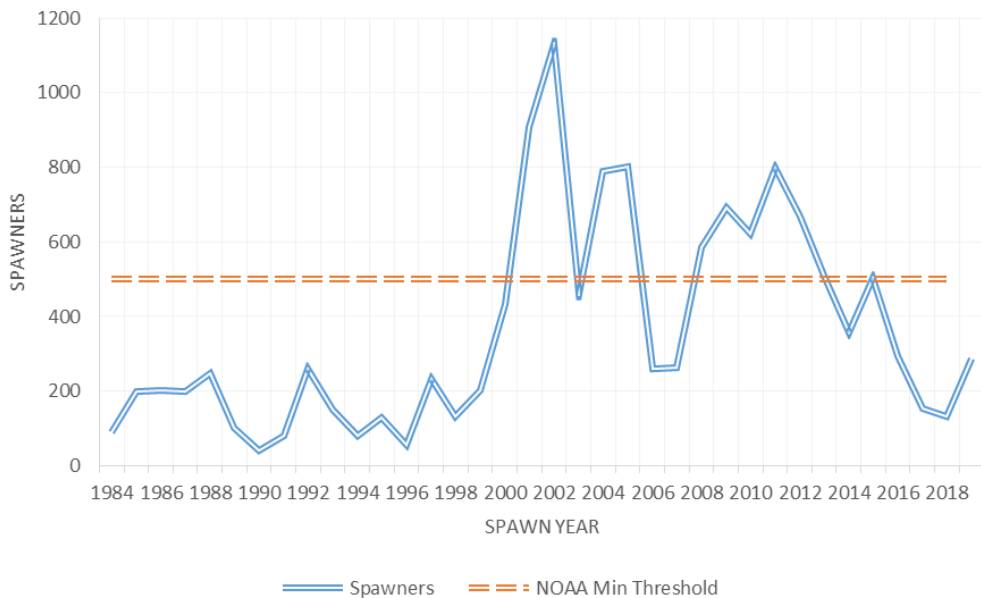
SATUS CREEK STEELHEAD



— Spawners — NOAA Min Threshold

Toppenish Creek

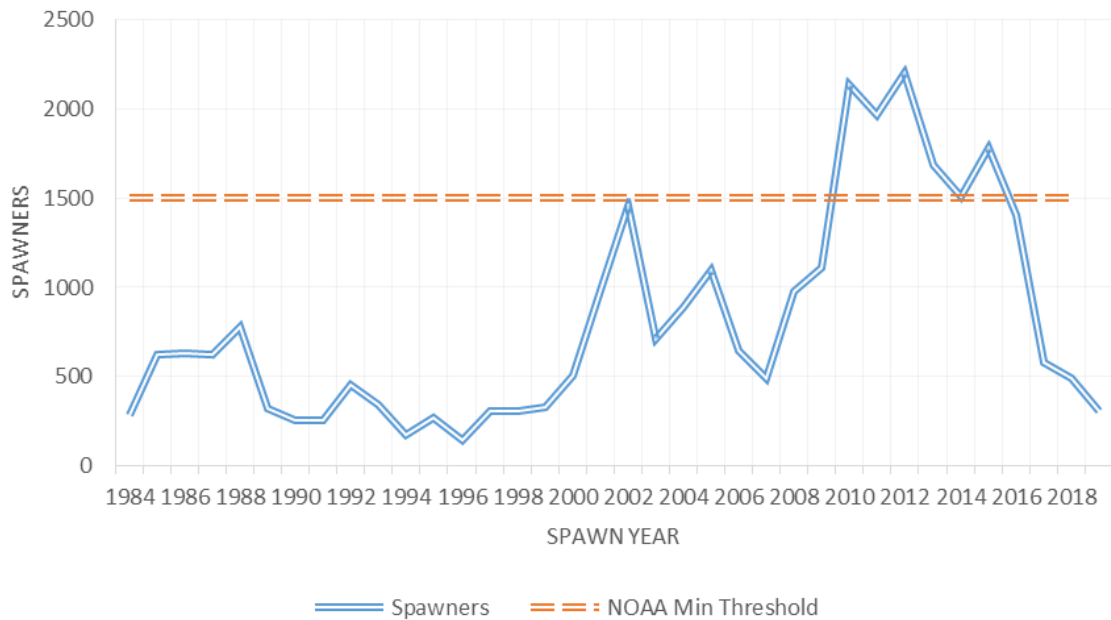
TOPPENISH CREEK STEELHEAD



2017 – 154 spawners
2018 – 131 spawners
2019 – 296 spawners

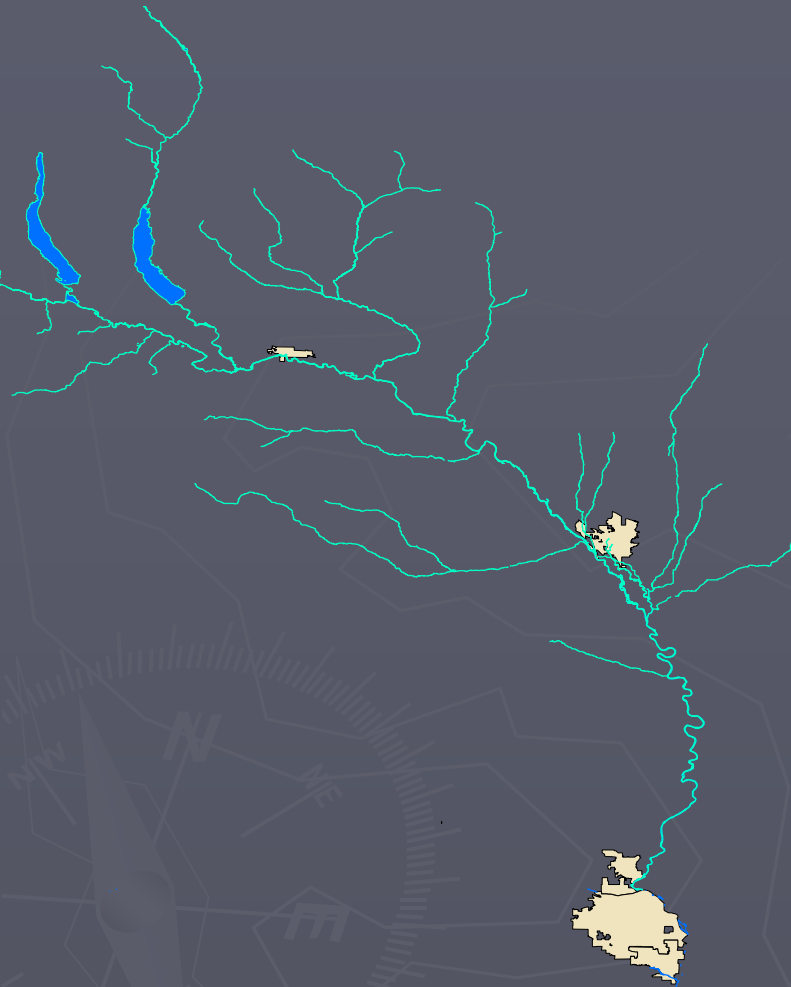
Naches River

NACHES RIVER STEELHEAD



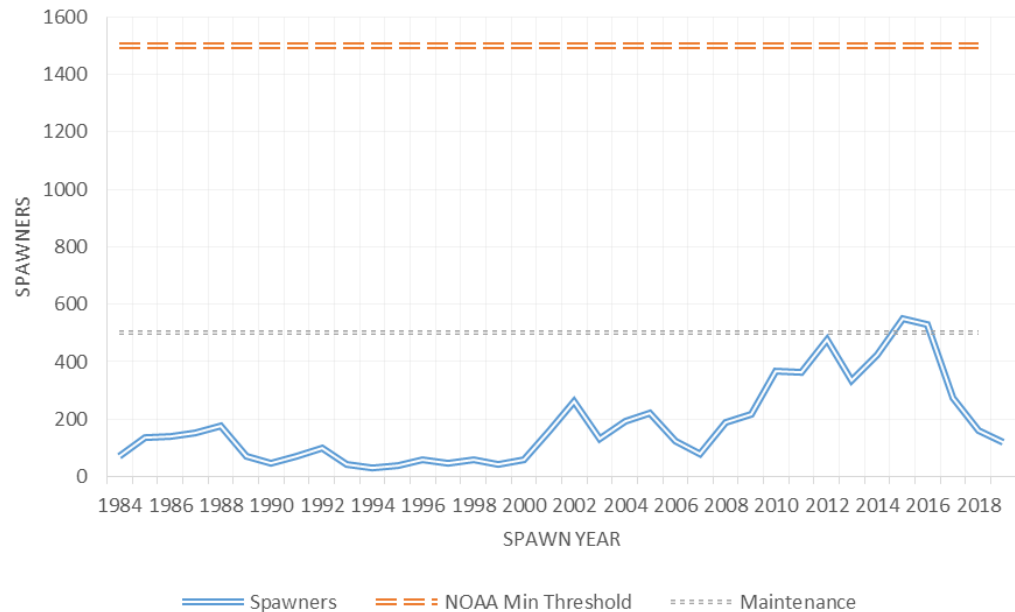
2017 – 577 spawners
2018 – 492 spawners
2019 – 306 spawners

Upper Yakima River



2017 – 272 spawners
2018 – 160 spawners
2019 – 119 spawners

UPPER YAKIMA RIVER STEELHEAD

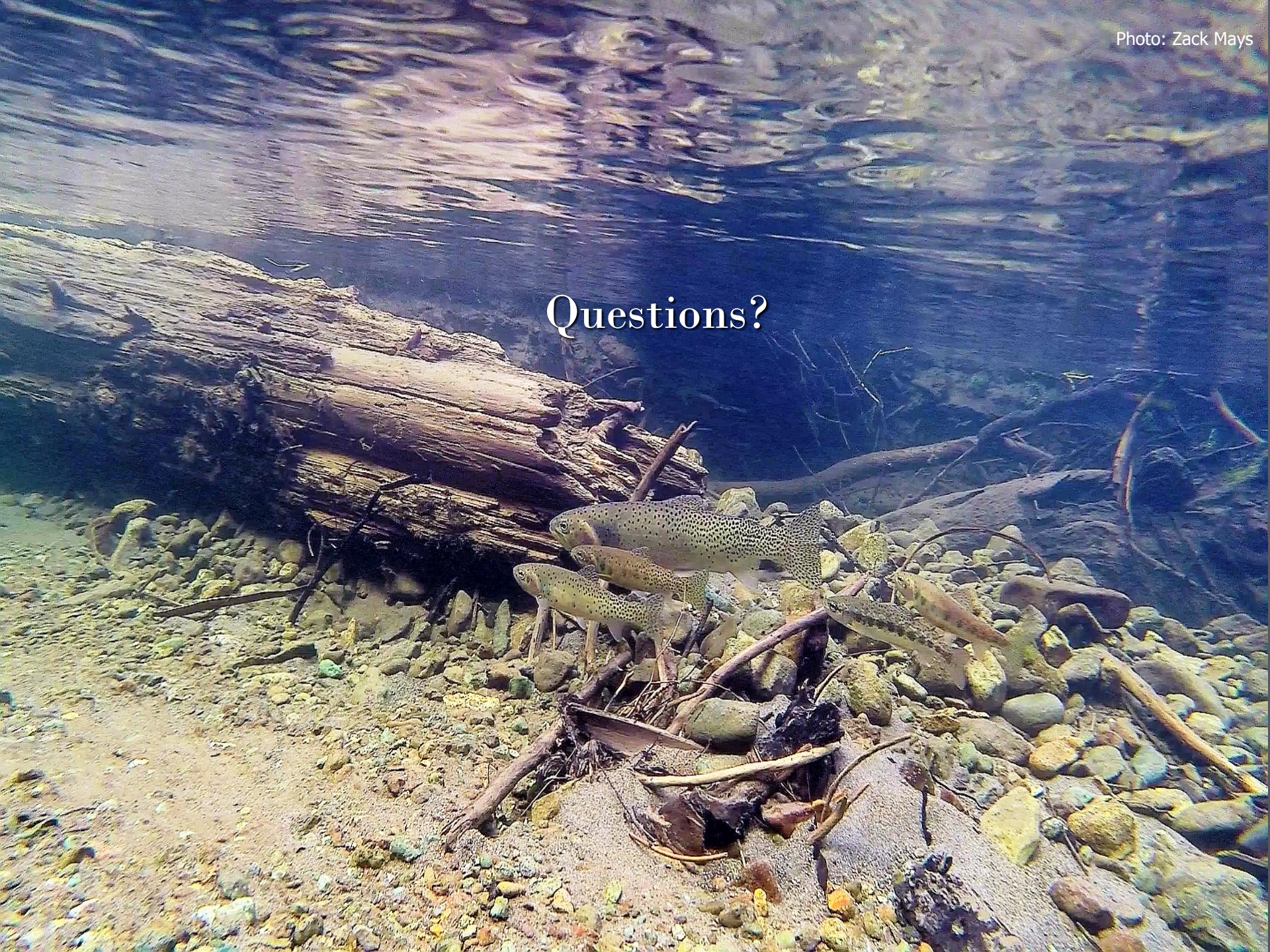


NOAA Fisheries Ocean Ecosystem Indicators

"Stoplight Chart"

Ecosystem Indicators	Year																				
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
PDO (Sum Dec-March)	18	6	3	13	7	20	12	16	14	9	5	1	15	4	2	8	10	21	19	17	11
PDO (Sum May-Sept)	10	4	6	5	11	17	16	18	12	14	2	9	7	3	1	8	19	21	20	15	13
ONI (Average Jan-June)	20	1	1	7	14	16	15	17	9	12	3	11	18	4	6	8	10	19	21	13	5
46050 SST (*C; May-Sept)	16	9	3	4	1	8	21	15	5	17	2	10	7	11	12	13	14	20	18	6	19
Upper 20 m T (*C; Nov-Mar)	20	11	8	10	6	15	16	12	13	5	1	9	17	4	3	7	2	21	19	18	14
Upper 20 m T (*C; May-Sept)	17	12	14	4	1	3	21	19	7	8	2	5	13	10	6	18	20	9	15	11	16
Deep temperature (*C; May-Sept)	21	6	8	4	1	10	12	16	11	5	2	7	14	9	3	15	20	18	13	17	19
Deep salinity (May-Sept)	19	3	9	4	5	16	17	10	6	1	2	14	18	13	12	11	20	15	8	7	6
Copepod richness anom. (no. species; May-Sept)	19	2	1	7	6	14	13	18	15	10	8	9	17	4	5	3	11	20	21	16	12
N. copepod biomass anom. (mg C m ⁻³ ; May-Sept)	19	14	10	11	3	16	13	20	15	12	6	9	8	1	2	4	5	17	21	18	7
S. copepod biomass anom. (mg C m ⁻³ ; May-Sept)	21	2	5	4	3	14	15	20	13	10	1	7	16	9	8	6	11	18	19	17	12
Biological transition (day of year)	18	8	5	7	9	14	13	19	12	2	1	3	16	6	10	4	11	21	21	17	15
Ichthyoplankton biomass (mg C 1,000 m ⁻³ ; Jan-Mar)	21	12	3	8	10	19	18	15	17	16	2	13	5	14	11	9	20	6	7	1	4
Ichthyoplankton community index (PCO axis 1 scores; Jan-Mar)	10	13	2	7	5	11	20	18	3	12	1	14	15	8	4	6	9	19	21	17	16
Chinook salmon juvenile catches (no. km ⁻¹ ; June)	19	4	5	16	8	12	17	20	11	9	1	6	7	15	3	2	10	13	18	21	14
Coho salmon juvenile catches (no. km ⁻¹ ; June)	19	8	13	6	7	3	16	20	17	5	4	10	11	15	18	1	12	9	14	21	2
Mean of ranks	17.9	7.2	6.0	7.3	6.1	13.0	15.9	17.1	11.3	9.2	2.7	8.6	12.8	8.1	6.6	7.7	12.8	16.7	17.2	14.5	11.6
Rank of the mean rank	21	5	2	6	3	15	17	19	11	10	1	9	13	8	4	7	13	18	20	16	12
<i>Ecosystem Indicators not included in the mean of ranks or statistical analyses</i>																					
Physical Spring Trans. UI based (day of year)	3	7	20	17	4	13	15	21	13	1	6	2	8	11	18	9	19	10	5	16	11
Physical Spring Trans. Hydrographic (day of year)	20	3	13	8	5	12	14	21	6	9	1	9	18	3	11	2	16	7	17	19	14
Upwelling Anomaly (April-May)	10	3	17	6	9	14	13	21	10	4	7	8	15	17	15	12	19	1	2	20	5
Length of Upwelling Season UI based (days)	6	2	19	12	1	14	10	21	5	3	9	3	16	18	16	15	20	11	8	13	7
SST NH-5 (*C; May-Sept)	9	6	5	4	1	3	21	16	10	18	2	19	11	7	14	13	15	12	17	8	20
Copepod Community Index (MDS axis 1 scores)	20	3	4	8	1	13	15	18	16	10	2	6	12	9	7	5	11	19	21	17	14
Coho Juv Catches (no. fish km ⁻¹ ; Sept)	11	2	1	4	3	6	12	14	8	9	7	15	13	5	10	NA	NA	NA	NA	NA	NA

Questions?



Yakima River Steelhead MPG: Proportion of Bonneville Group A wild

