

Lake Washington/Cedar/Sammamish Watershed (WRIA 8)



Fish In/Fish Out Monitoring Summary March 19, 2015



King County

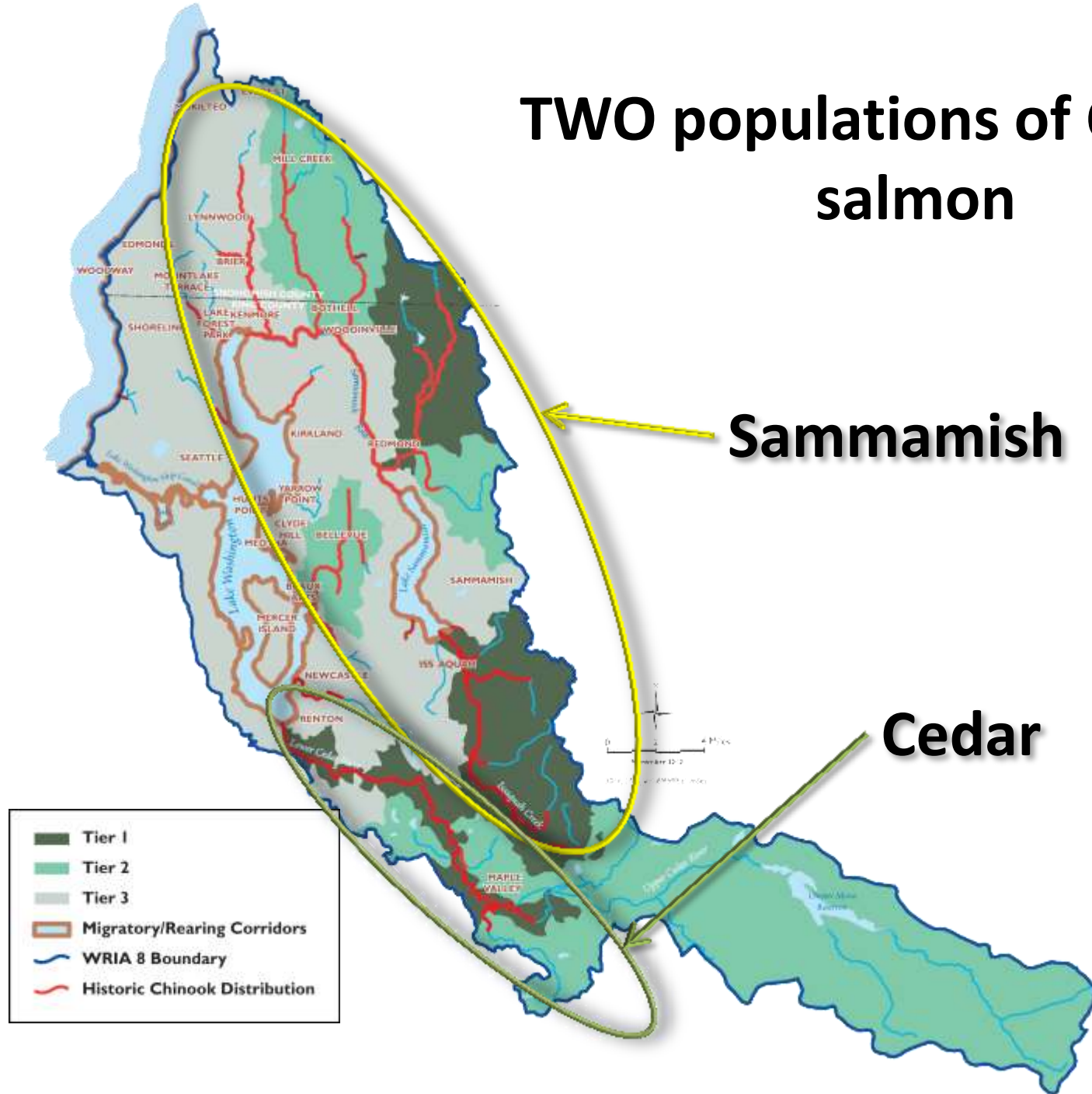
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Lake Washington/Cedar/Sammamish Watershed
(WRIA 8)

Viability Salmonid Populations (VSP)

- **Abundance**
(How many?)
(Hatchery vs natural-origin)
- **Productivity**
(Population growth)
- **Spatial Distribution**
(Where are they? Tier 1 vs. Tier 2 etc.)
- **Life History Diversity**
(Migration timing – early vs. late)
(Age structure of adult returns)



TWO populations of Chinook salmon



Abundance

- Live counts 1x per week in all streams with Chinook*
- Carcass sampling
- Redd Identification and location (2-3x per week)
- Analysis
 - Area-under-the-curve (AUC)
 - Redd counts (2.5 fish/redd) to reduce error



Live Counts

Chinook

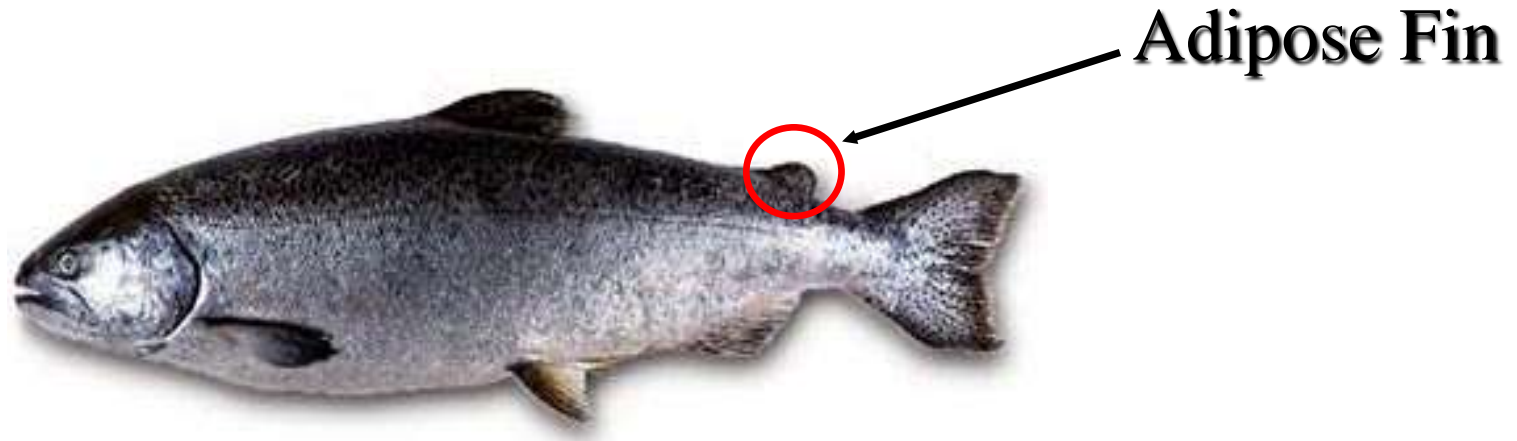
Sockeye



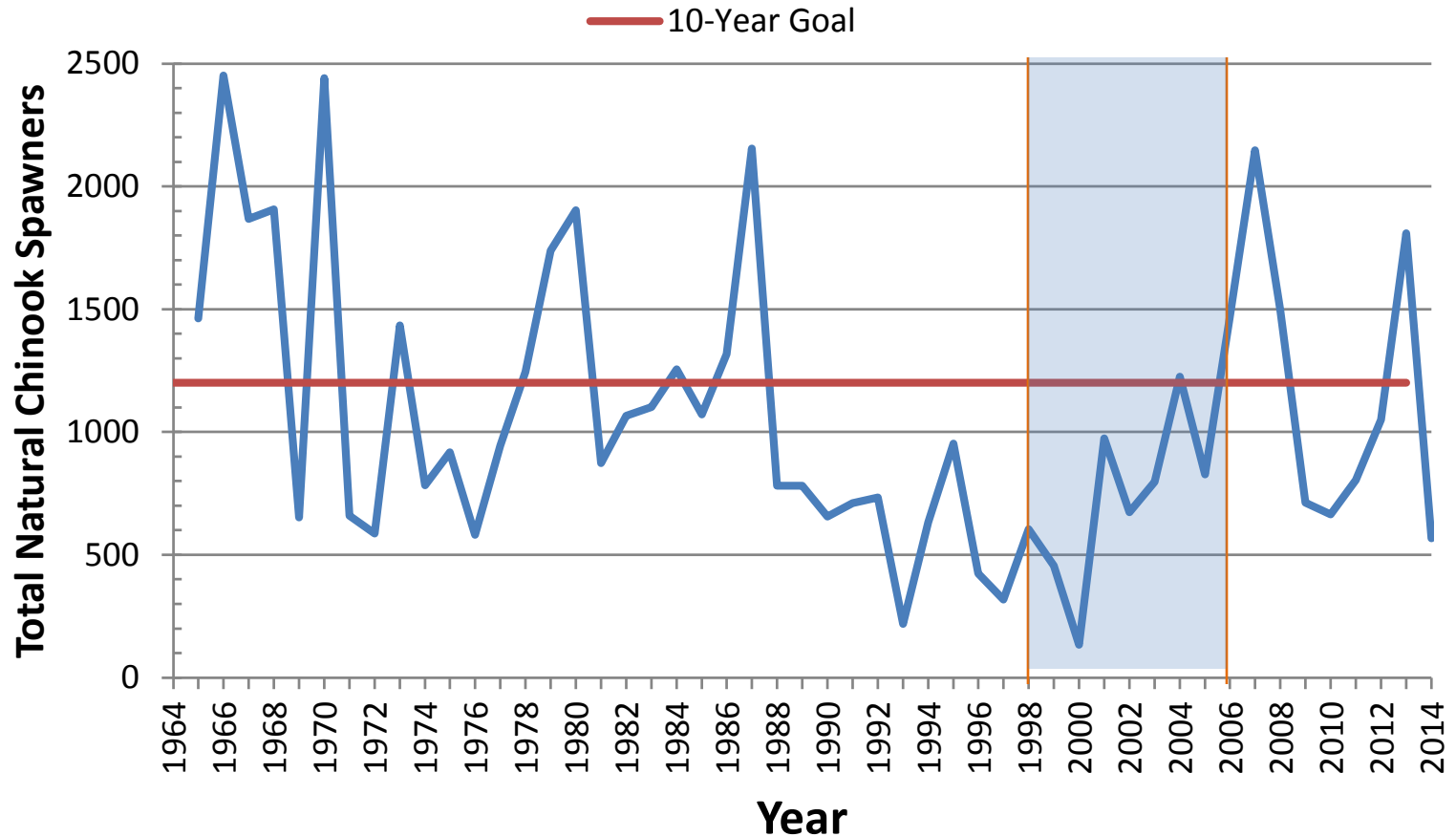
Redds



Presence of Hatchery Fish on Spawning Grounds



Cedar Escapement

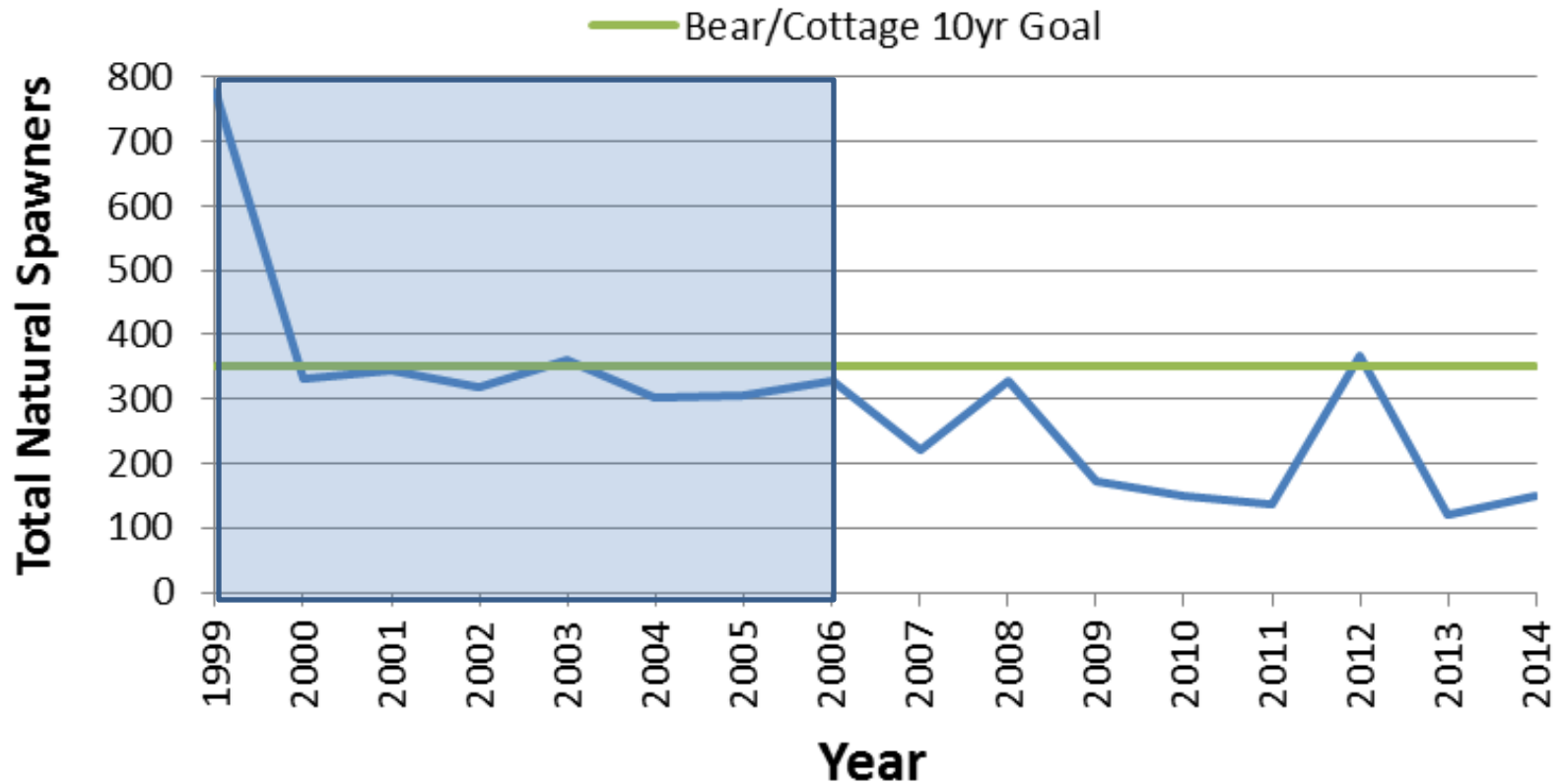


Source: WDFW, W8TC

73% **increase** in Chinook abundance 2007-2014
(compared to 1998-2006) (2014 = **568**)



Sammamish Escapement (includes Bear/Cottage Index Reaches)



Source: WDFW, W8TC

48% **decrease** in Chinook abundance 2007-2014
(compared to 1999-2006) (2014 = **150**)



Productivity

Juvenile outmigrant trapping

- Bear Creek
- Cedar River

- January-June
- Fry vs. Parr (early vs. late) output
- Timing and survival to Locks



Jan-April small fry
(45mm) migration



May-June larger
parr (60-100mm)
migration

Productivity

Goal: increase the **number** of juvenile migrants

Emphasis on parr migrants;
need more parr

(Needed: more rearing and flood refuge
on Cedar = flood plain restoration)



Jan-April small fry
(45mm) migration

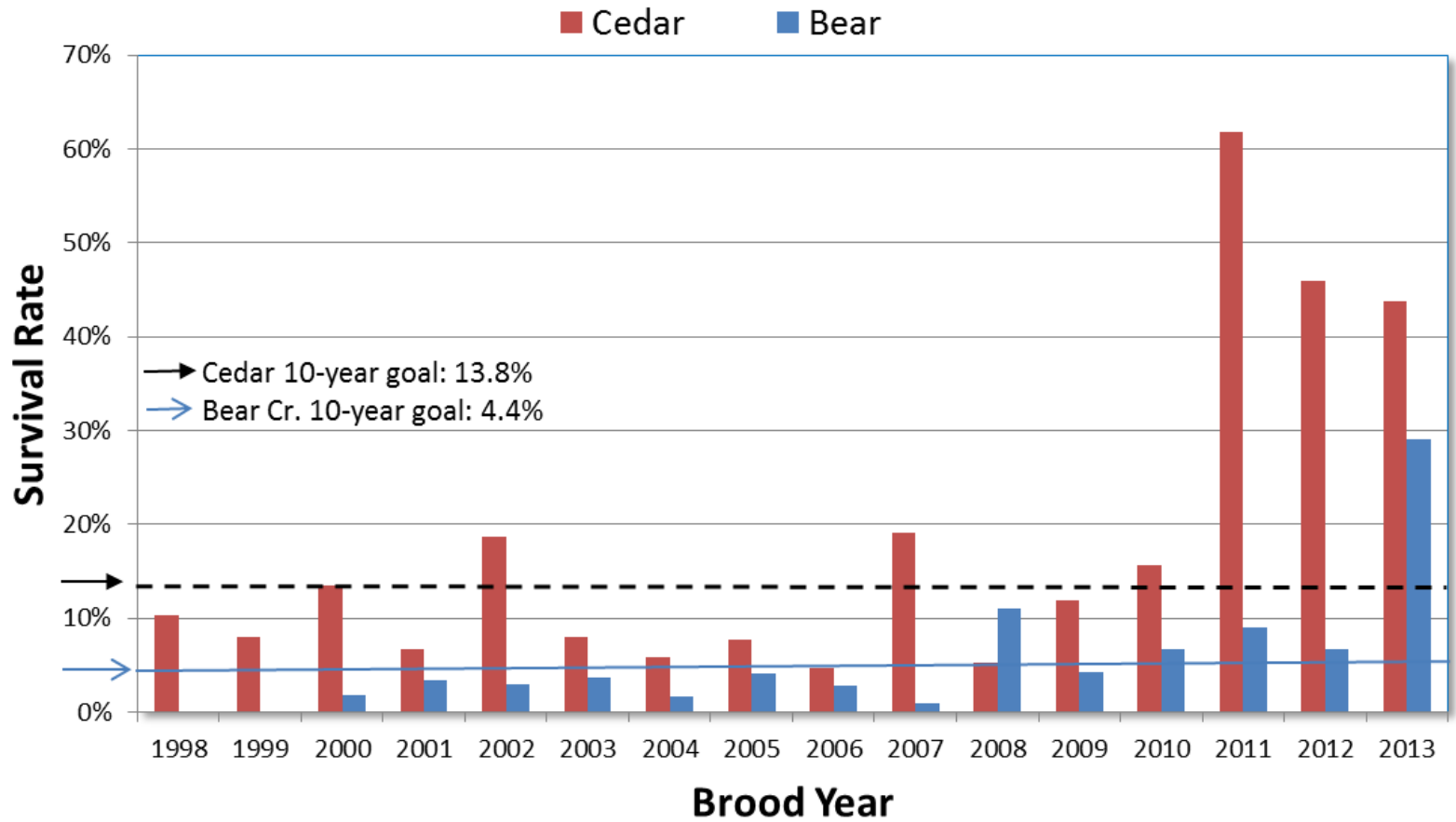


May-June larger
parr (60-100mm)
migration



Productivity

WRIA 8 Chinook Salmon Egg-to-Migrant Survival Rate 1998-2013



Source: WDFW, W8TC

Productivity

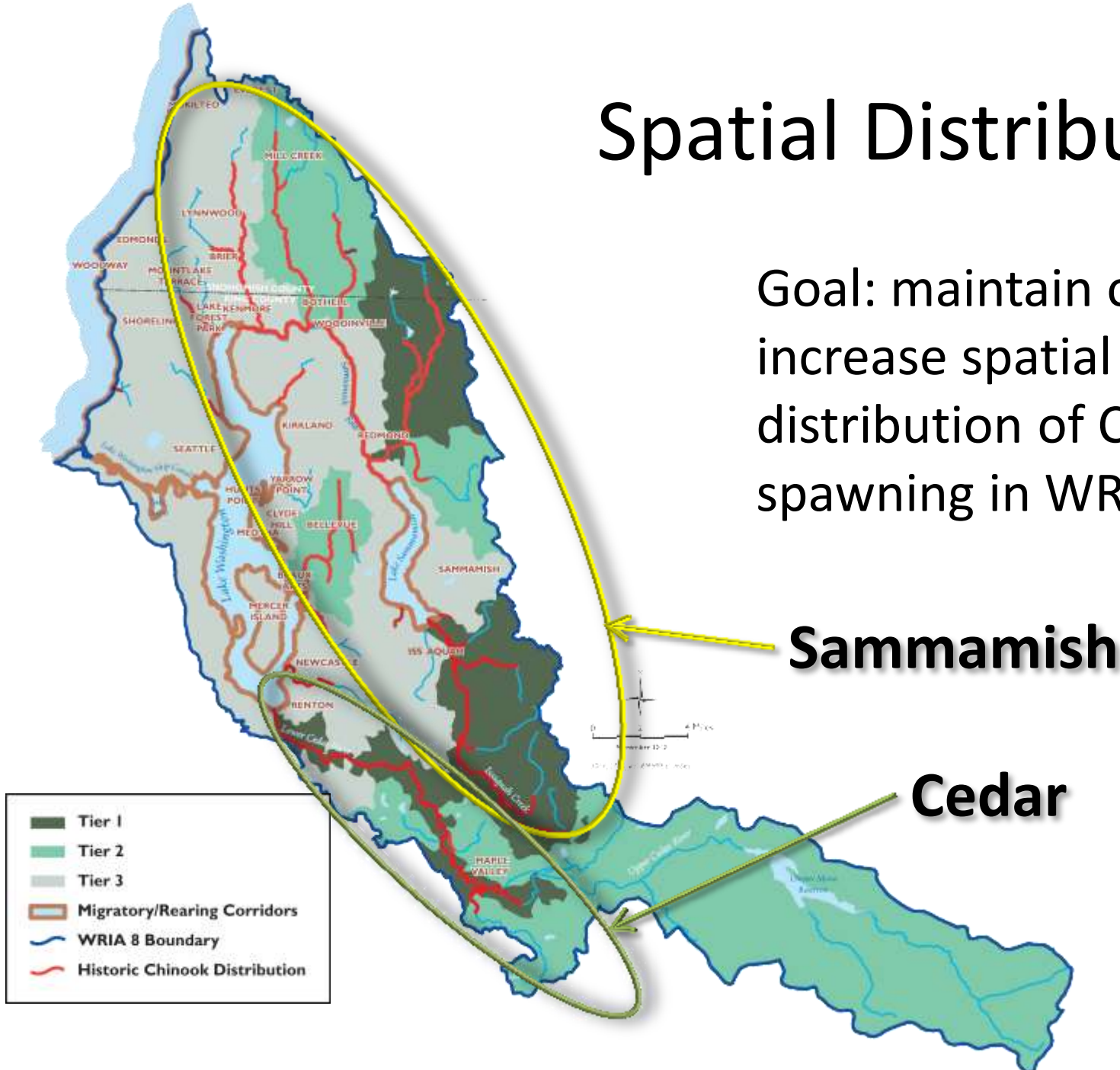


Total juvenile
Chinook migrants:
1998-2006
vs.
2007-2014

Cedar: 205% increase
Bear/Cottage: 86%
increase

Spatial Distribution

Goal: maintain or increase spatial distribution of Chinook spawning in WRIA 8.



Sammamish

Cedar

Spatial Distribution

Chinook salmon redd surveys, WRIA 8

Creek	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Bear	140	30	42	25	24	25	40	12	20	44	9	1	17	41	16	5
Cottage	171	103	96	102	120	96	82	119	69	88	60	59	38	106	32	55
EF Issaquah				0	3	26	8	3	30	3	19	29	18	15	28	31
Little Bear	1	1	1	3	3	1	0	0	2	1	0	0	0	0		
North Creek	2	4	6	10	1	4	5	9	3	8	7	3	5	14		
Kelsey Creek		5	4	4	0	0	4	72	77	8	5	0	0	0	0	0
May Creek	0	1	3		5	9	1	0	7	1	2	1	1	2		
Rock Creek (Lower)	0	0	0	0	0	0	0	0	0	0	0	3	0	2	7	0
Taylor Creek	0	0	7	12	11	8	7	1	30	0	0	1	2	11	9	5
Peterson Creek	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0
Walsh Creek	0	0	1	0	6	12	0	0	10	0	X	X	X	X	X	X
Cedar River Mainstem (and tribs above L'burg)	182	53	390	269	319	490	331	586	859	599	285	262	322	420	724	227

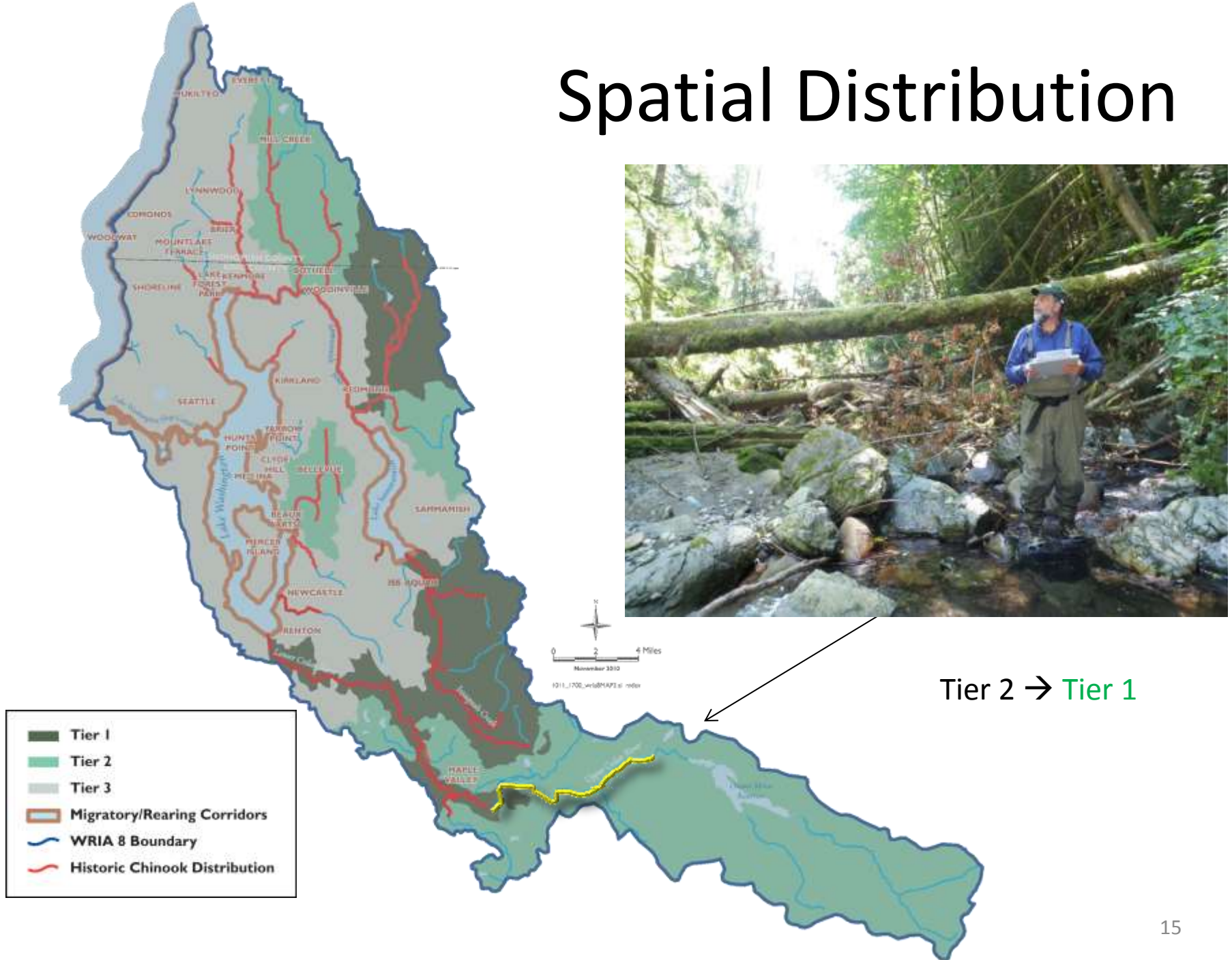
Tier 1 areas

Tier 2 areas

Not surveyed

Source: WDFW, W8TC

Spatial Distribution



Diversity

Goal: increase the **proportion** of parr migrants in Cedar River Population

Overall **number** has **increased**.... but **proportion** has **declined** because overall number of fry migrants has increased

1998-2006 geometric mean: 27,000

2007-2012 geometric mean: **36,000**

33% increase



Acknowledgements

Washington Department of Fish and Wildlife
King County Department of Natural Resources and Parks
Seattle Public Utilities
Muckleshoot Indian Tribe
WRIA 8 Salmon Recovery Council
King Conservation District
King County Flood Control District





Pacific Salmon Migration Patterns



Monitoring Program	VSP Parameters			
	Abundance	Productivity	Distribution	Diversity
Spawner Surveys	Escapement, redd counts	Estimates of total eggs, prespawning mortality	Relative use of streams and rivers in core, satellite and episodic areas	Age structure, Hatchery or Natural origin
Fry/Smolt Trapping	Juvenile abundance	Egg to smolt survival (%)	Relative comparison of Bear vs. Cedar	Fry vs. parr (early vs. late migration timing)
PIT-Tag Monitoring		Migration survival estimates		Migration timing to ocean

