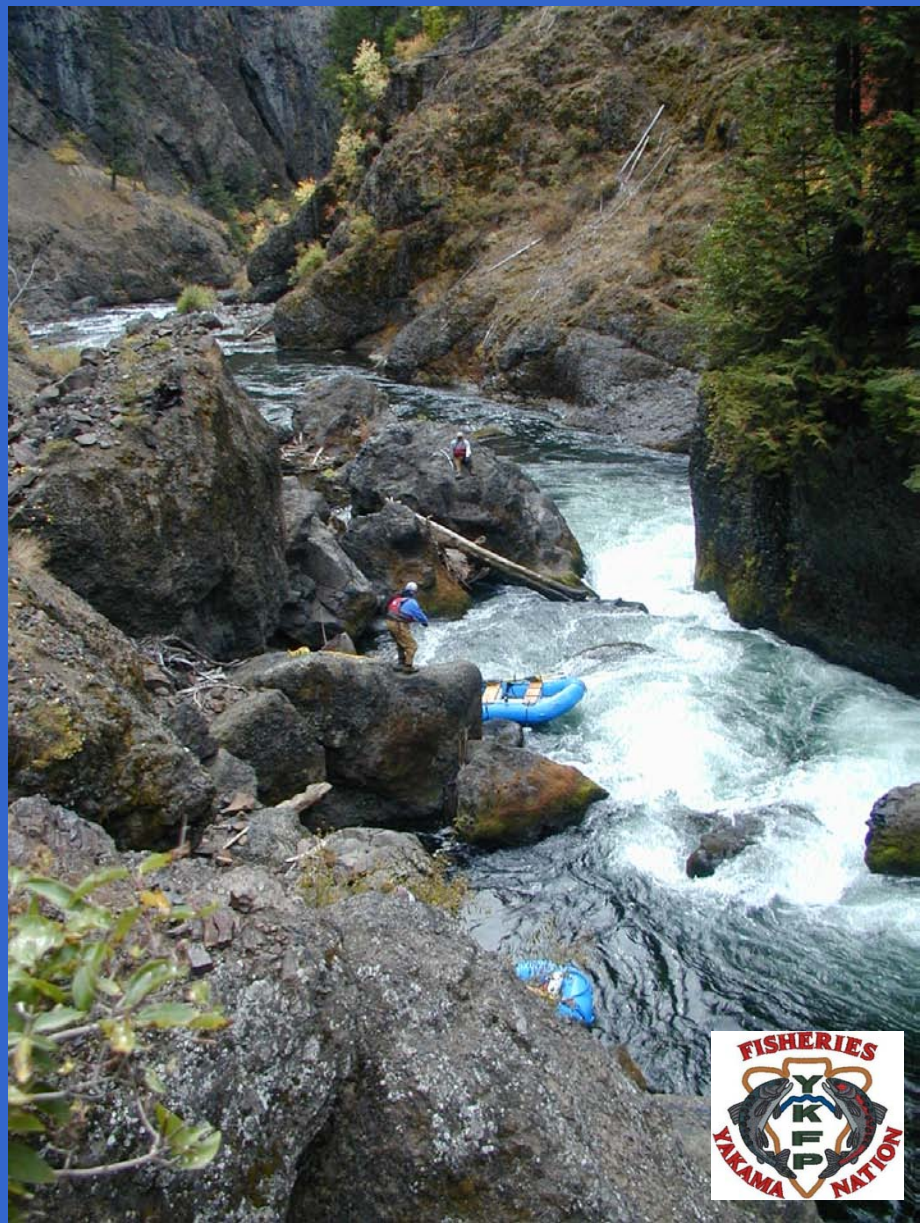
Klickitat Spring Chinook and Steelhead Monitoring: Run Size Updates



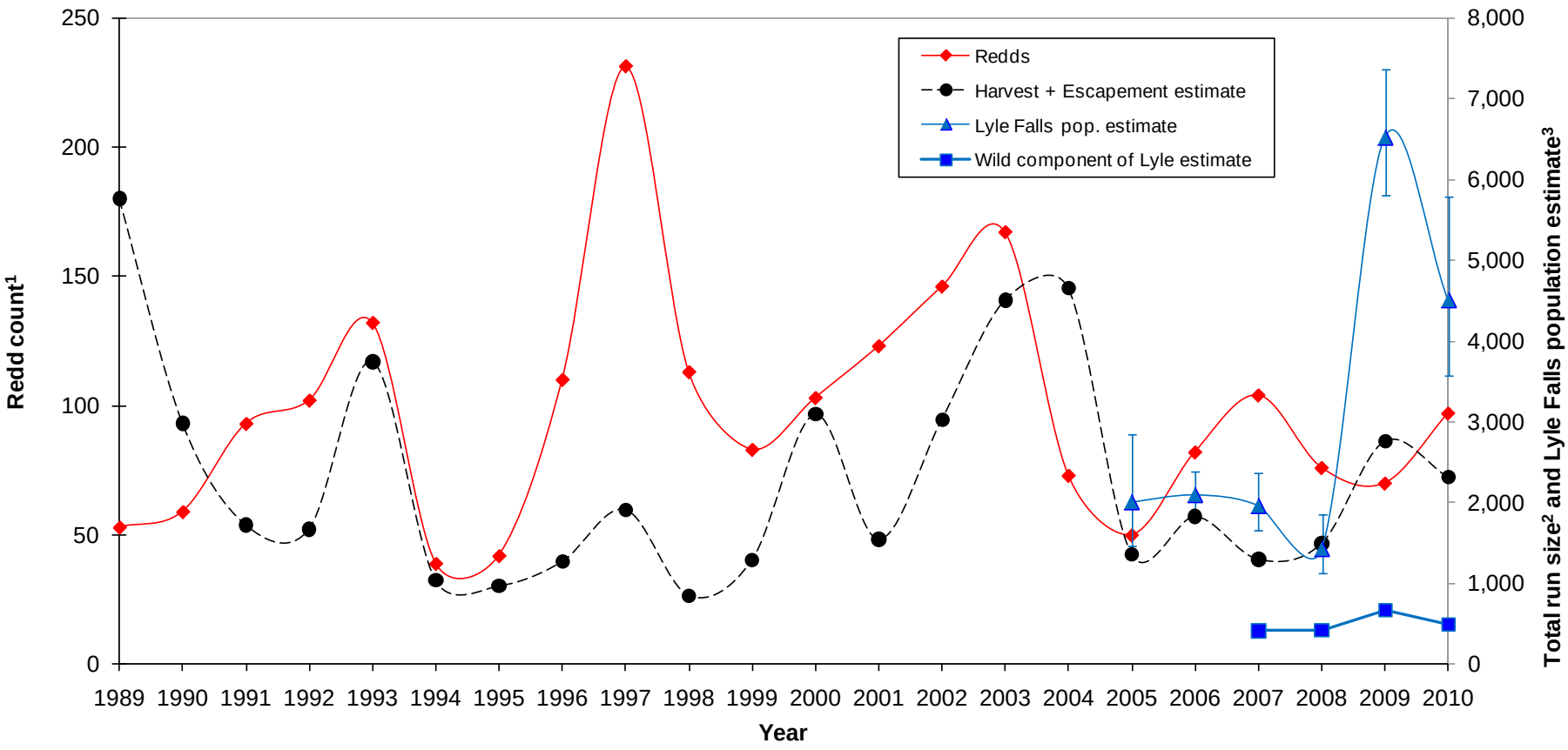
Joe Zendt

Yakama Nation Fisheries Program

Spring Chinook and Steelhead Adult Monitoring in the Klickitat subbasin

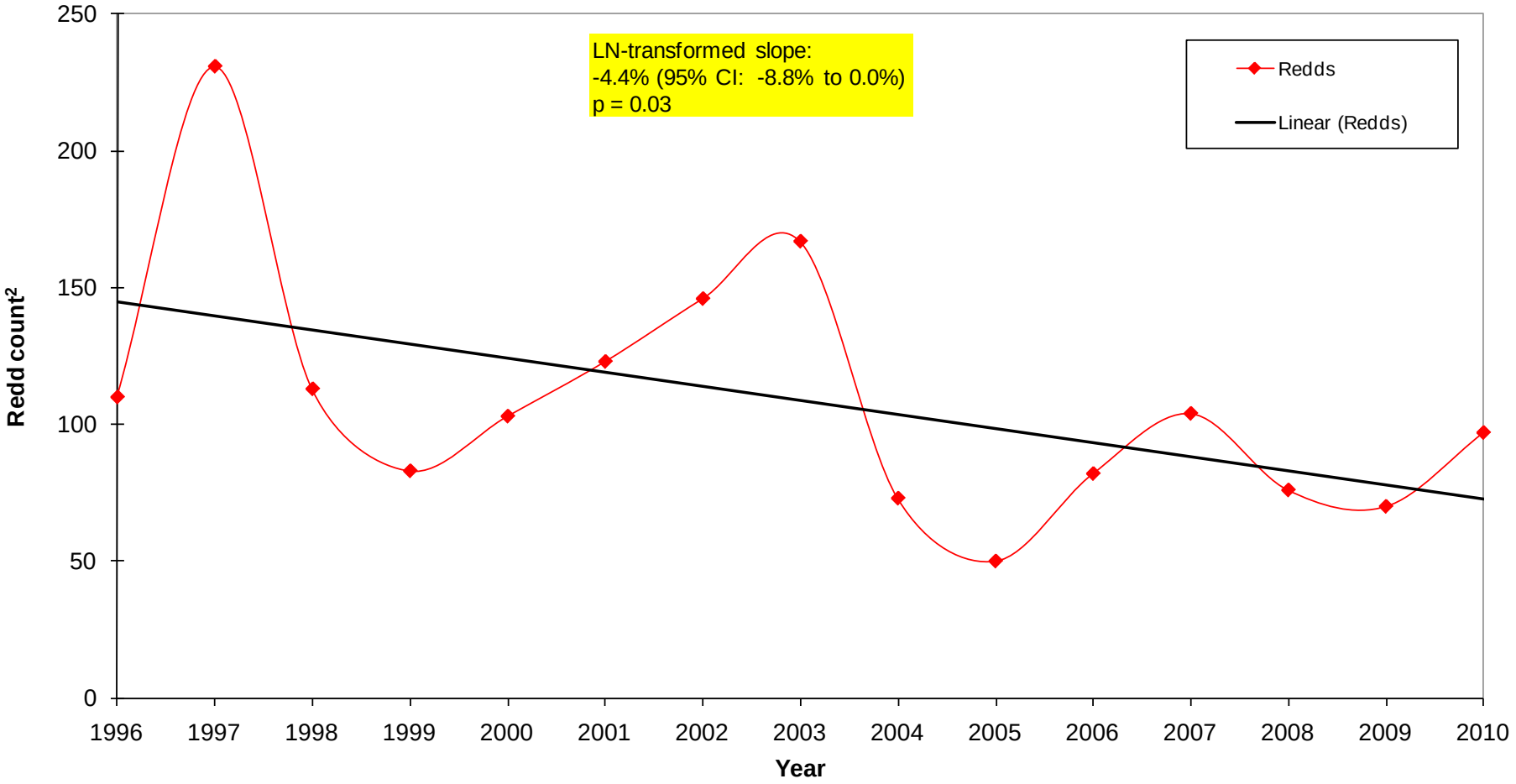
- Redd counts (spawner surveys)
  - Rafting and wading surveys
  - GPS locations recorded for redds
  - Biological data collected from carcasses
- Run Reconstruction (Harvest + Escapement)
  - Relies on redd counts for natural escapement
- Mark-recapture population estimates
  - Floy-tagged at Lyle Falls adult trap
  - Recaptured at Klickitat Hatchery (Spring Chinook) or by anglers (steelhead)
  - Peterson estimate

Klickitat Spring Chinook Redd Counts and Run Size Estimates, 1989-2010



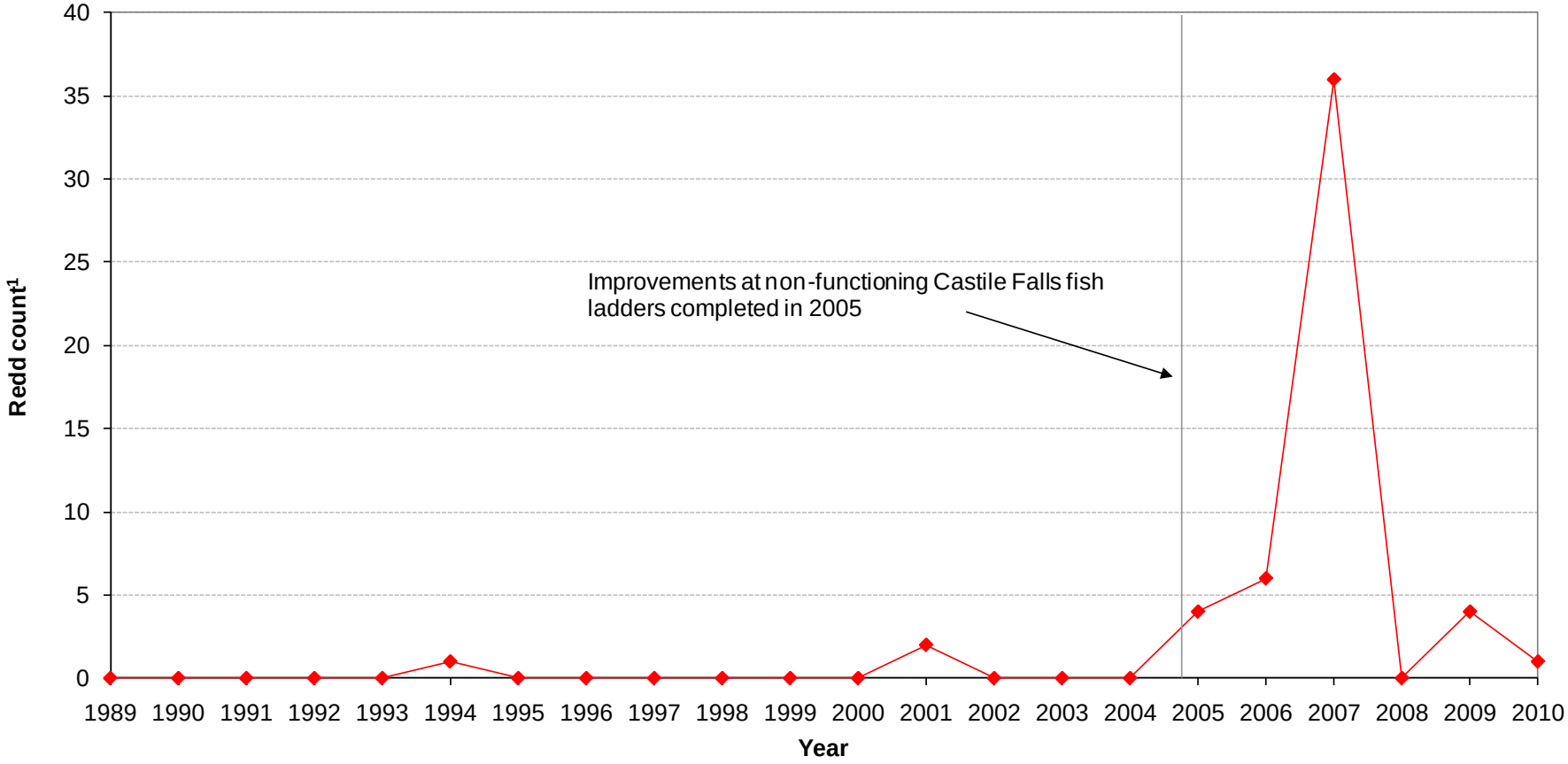
1 - Total redd counts minus hatchery adult releases above Castile
2 - Total run size of age-3 to age-6 fish estimated from natural spawner and hatchery escapement plus harvest (from YN and WDFW databases)
3 - Population estimate at Lyle Falls from mark-recapture methods (with wild component from % wild at Lyle adult trap; 2007 was first year of 100% ad-marked adult returns)

Klickitat Spring Chinook Redd Counts 1996-2010[1]



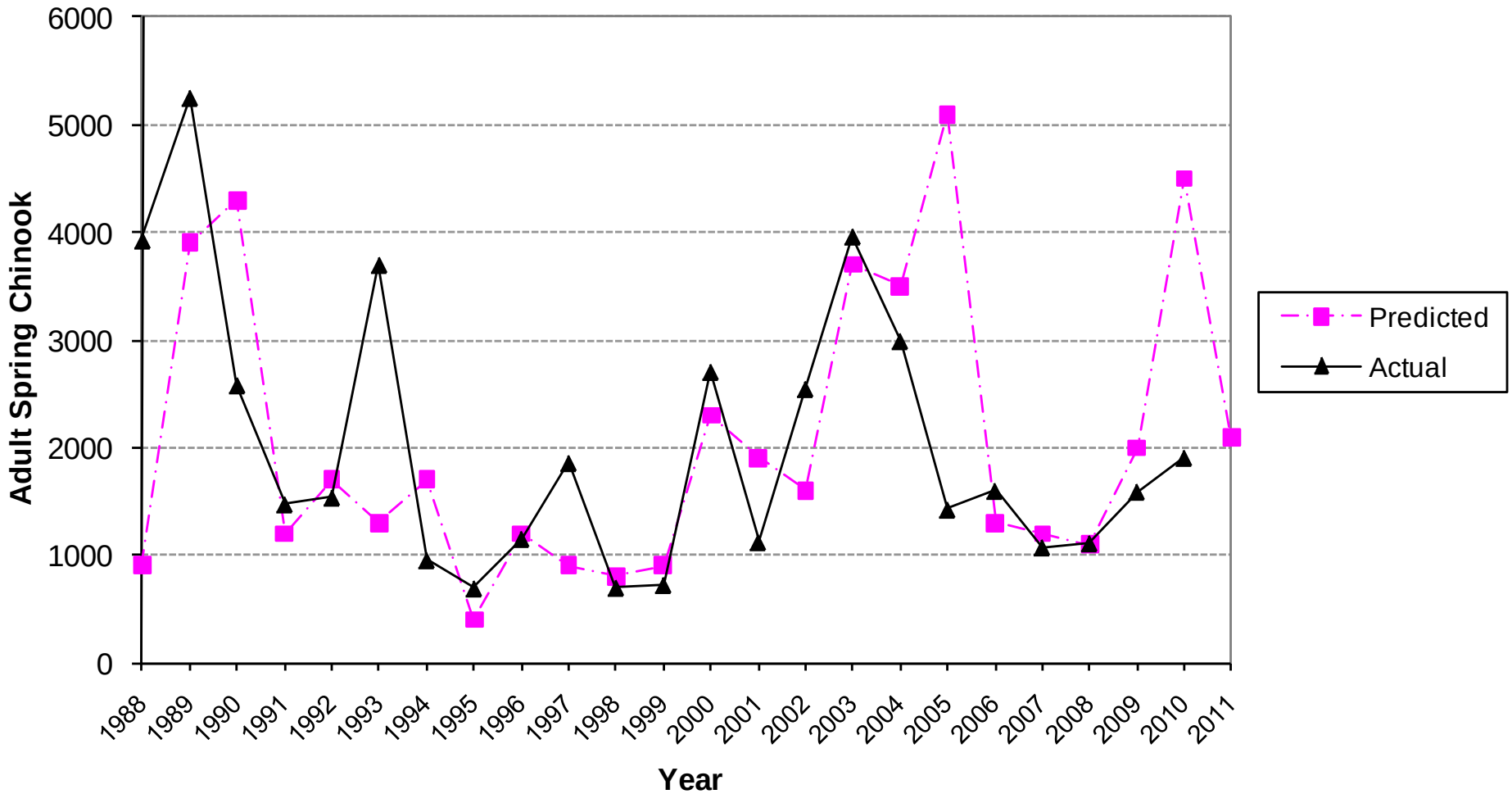
1 - 1996-2009 time period selected for consistency in geographic area coverage during redd surveys
2 - Total redd counts minus hatchery adult releases above Castile

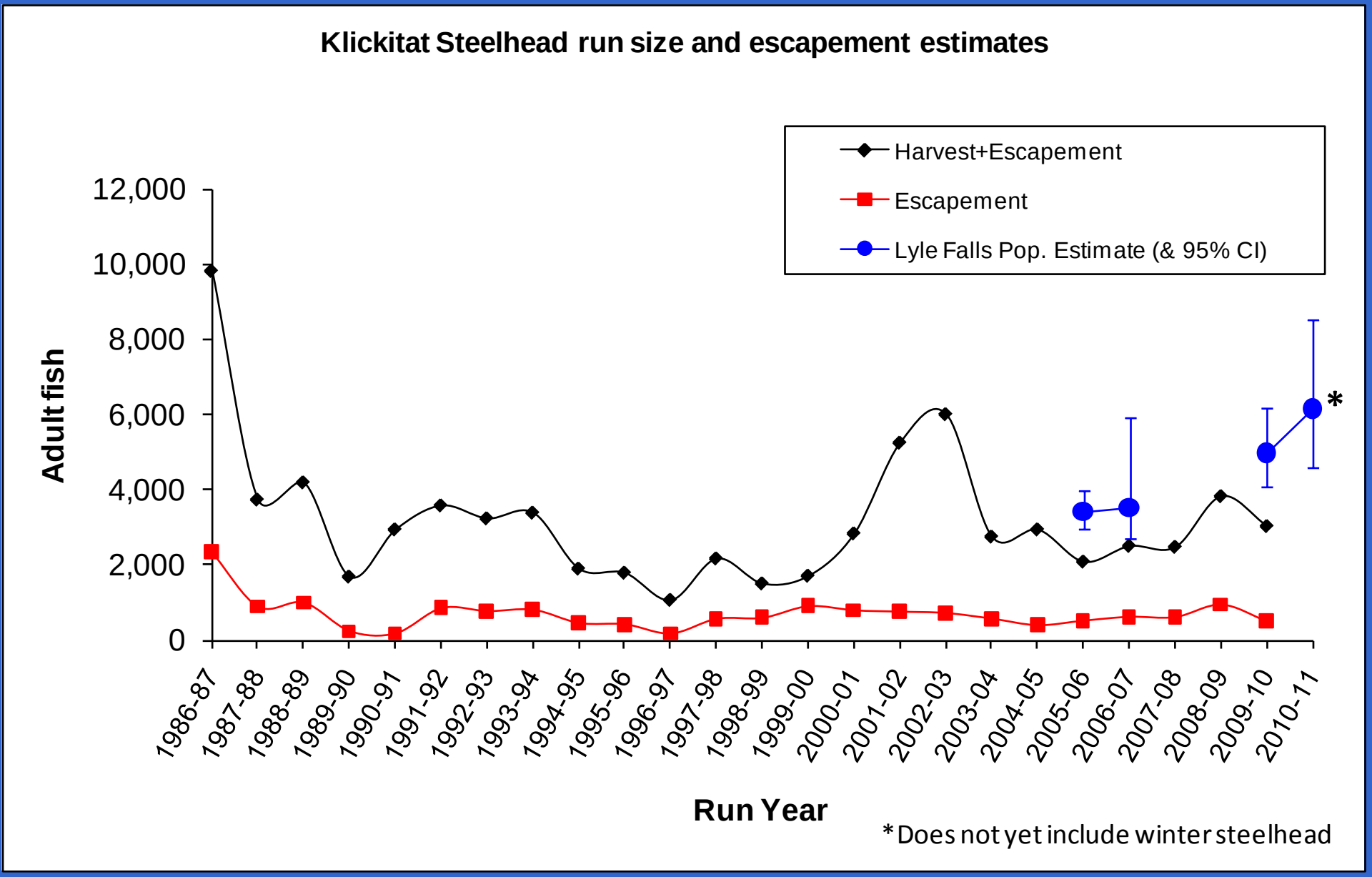
Klickitat Spring Chinook Redd Counts above Castile Falls, 1989-2010



1 - Total redd counts minus hatchery adult releases above Castile

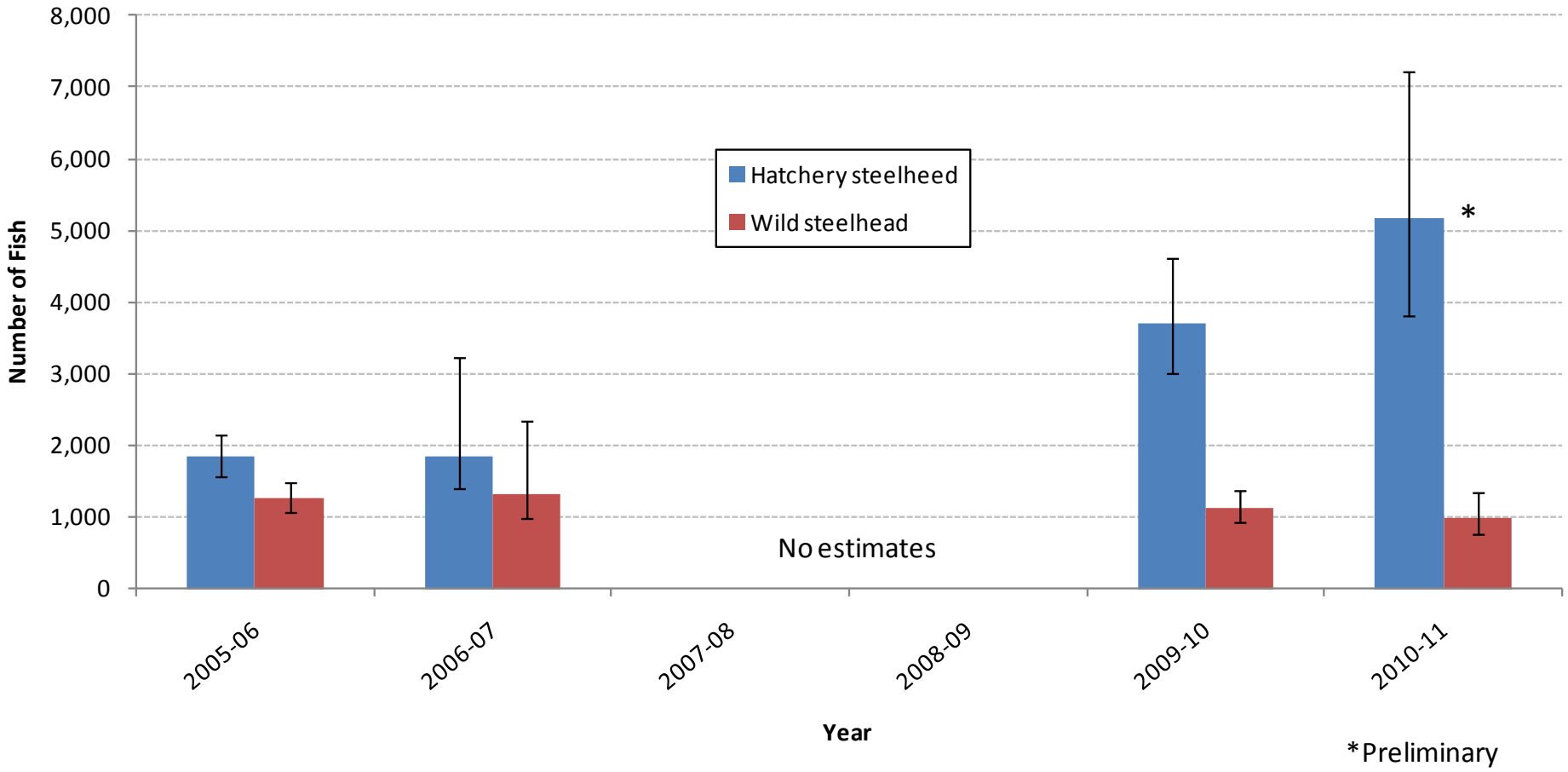
Spring Chinook Forecasts and Actual Adult Returns (Run Reconstruction method)




Klickitat Steelhead run size and escapement estimates
Harvest+Escapement
Escapement
Lyle Falls Pop. Estimate (& 95% CI)
12,000
10,000
8,000
6,000
4,000
2,000
0
Adult fish
1986-87
1987-88
1988-89
1989-90
1990-91
1991-92
1992-93
1993-94
1994-95
1995-96
1996-97
1997-98
1998-99
1999-00
2000-01
2001-02
2002-03
2003-04
2004-05
2005-06
2006-07
2007-08
2008-09
2009-10
2010-11
Run Year
*
*Does not yet include winter steelhead

Klickitat summer steelhead run size

Mark-recapture estimates at Lyle Falls



White Creek Steelhead monitoring

- Instream PIT tag detector in lower White Cr.
- Migration patterns and survival
- Pre- and post-habitat restoration monitoring
  - Fish abundance, condition
  - Benthic invertebrates
  - Riparian vegetation

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Jason Rau
Marilyn Scott
& Klickitat Hatchery staff

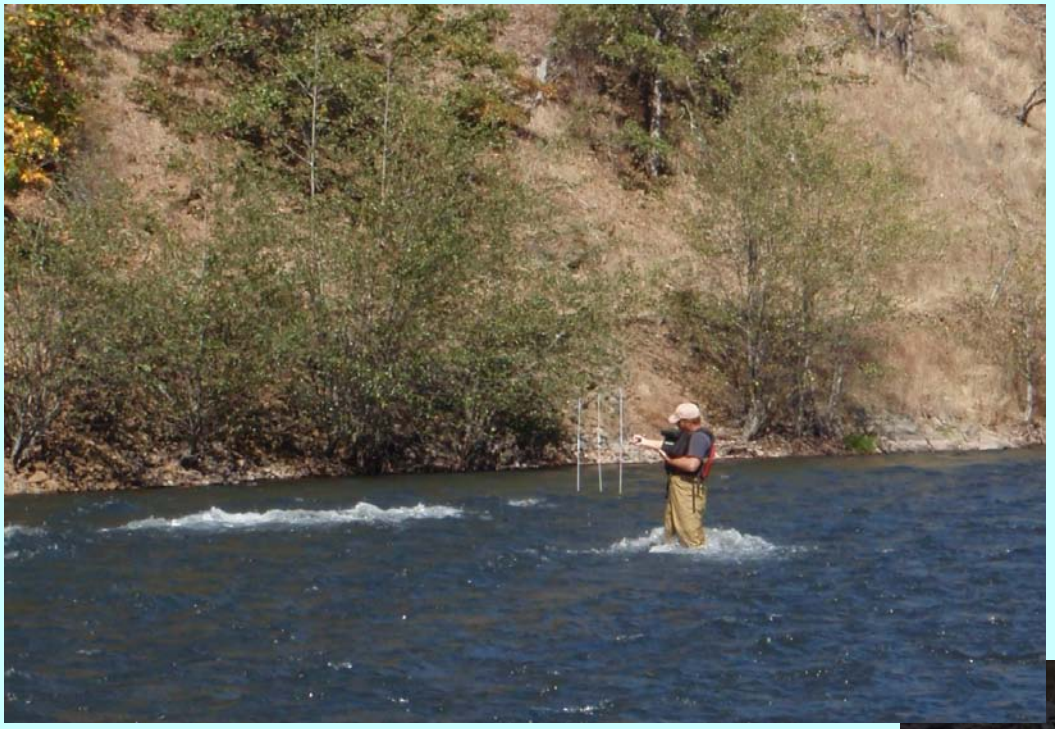
Klickitat River Basin Radio Telemetry: Preliminary Results

Shane Keep
Yakama Nation Fisheries Program

Brady Allen
U.S. Geological Survey

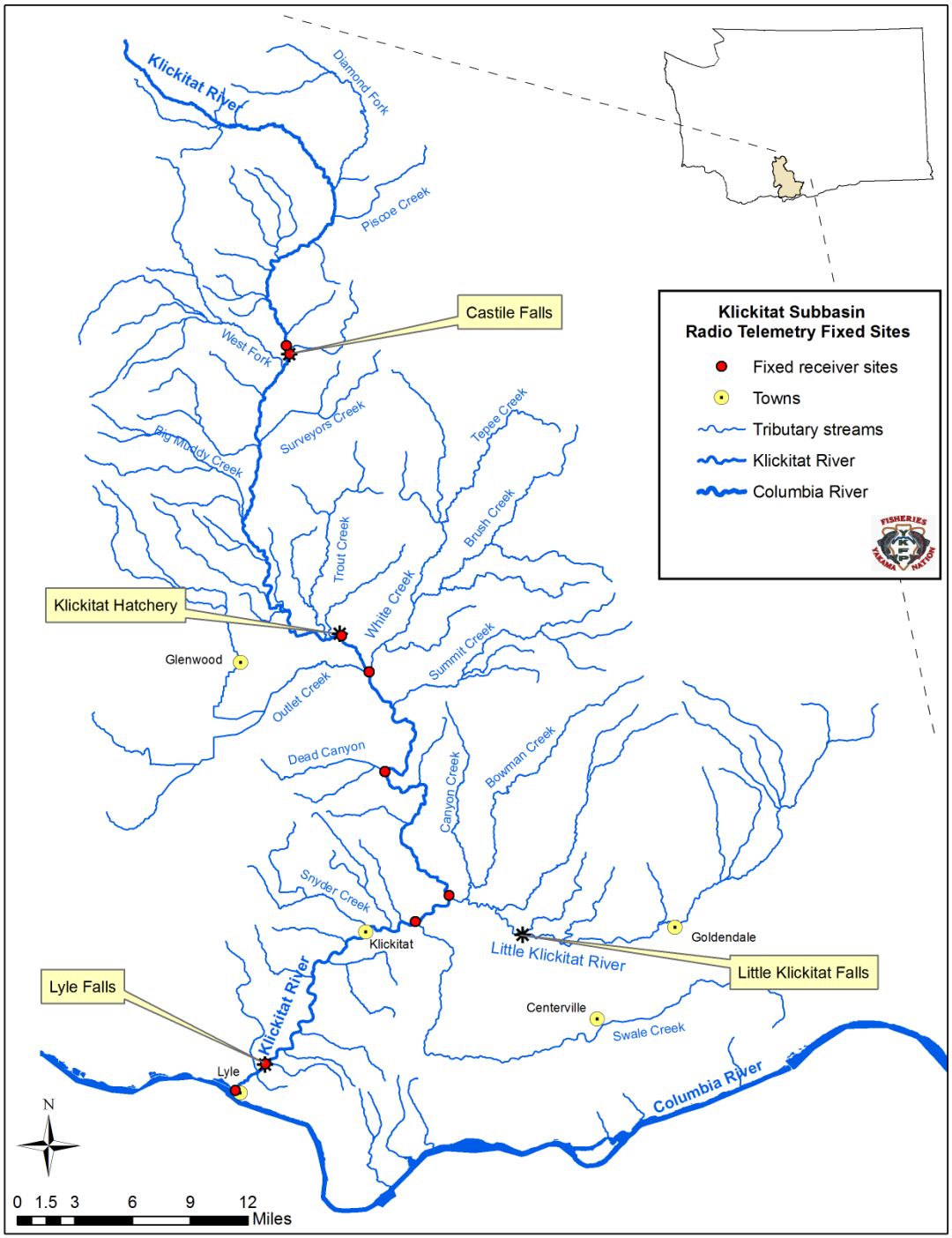
Project Overview:

- Objectives
  - Identify spatial and temporal overlap of habitat use by hatchery fish vs. wild fish, winter vs. summer steelhead
  - Quantify fallback, harvest, pre-spawn mortality rates
  - Identify/evaluate passage obstructions (falls, hatchery weir)
- Methods
  - Radio tagging, PIT tagging at Lyle falls fishway (river mile 2)
  - 9 fixed-site receivers at key locations (fishways, tributary stream confluences, Klickitat hatchery)
  - Mobile tracking (river-adjacent road/highway, raft, aircraft)
  - Tagged fish released 0.5 miles upstream of Lyle falls



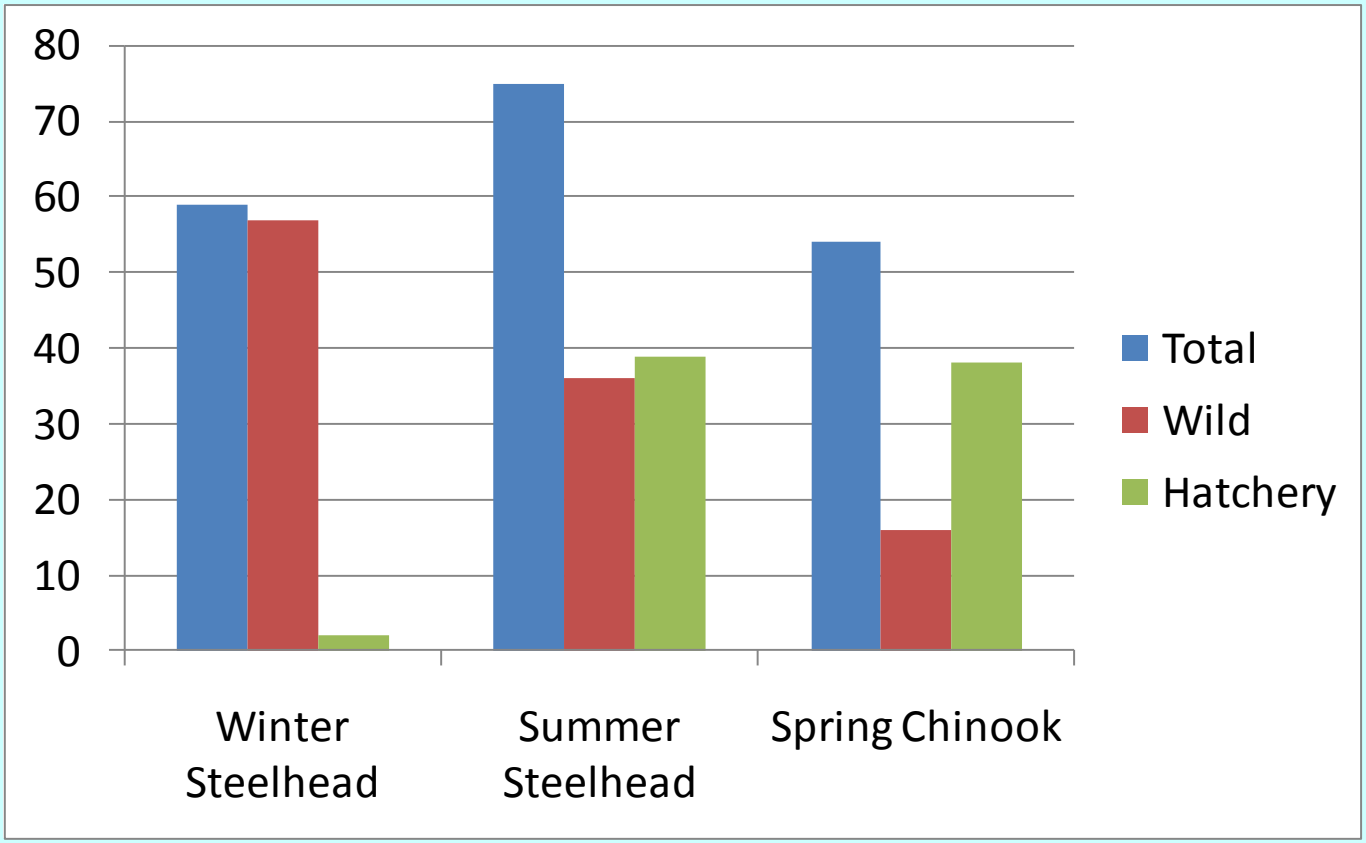
Mobile tracking

Fixed telemetry site

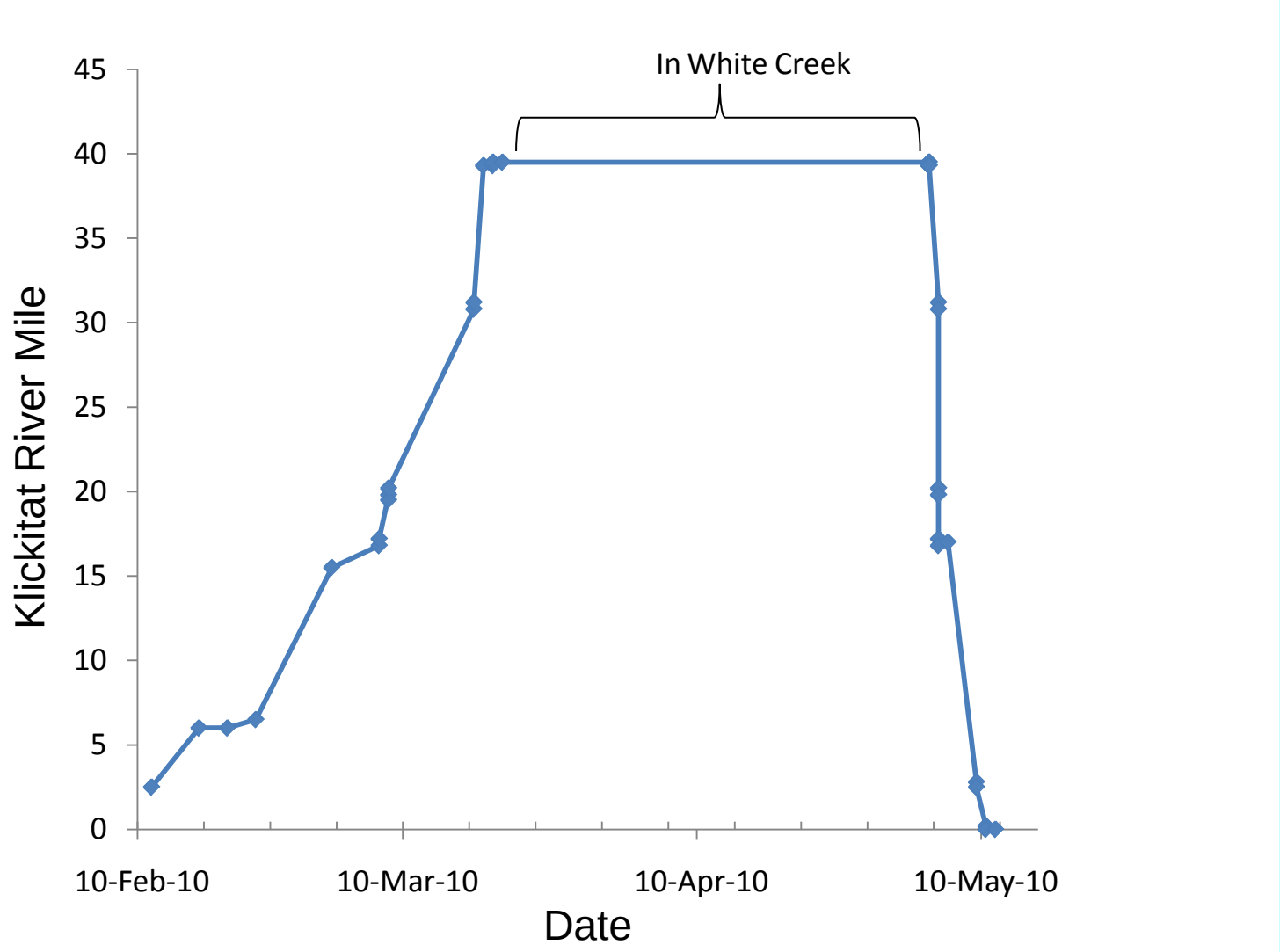

Klickitat River
Diamond Fork
Pisgoe Creek
Castile Falls
West Fork
Big Muddy Creek
Surveyors Creek
Tepee Creek
Brush Creek
Trout Creek
White Creek
Klickitat Hatchery
Glenwood
Outlet Creek
Summit Creek
Dead Canyon
Canyon Creek
Bowman Creek
Snyder Creek
Klickitat
Goldendale
Little Klickitat River
Little Klickitat Falls
Lyle Falls
Klickitat River
Centerville
Swale Creek
Lyle
Columbia River
N
0 1.5 3 6 9 12
Miles
Klickitat Subbasin
Radio Telemetry Fixed Sites
Fixed receiver sites
Towns
Tributary streams
Klickitat River
Columbia River
FISHERIES
YAKAMA NATION

Tagged Fish Totals

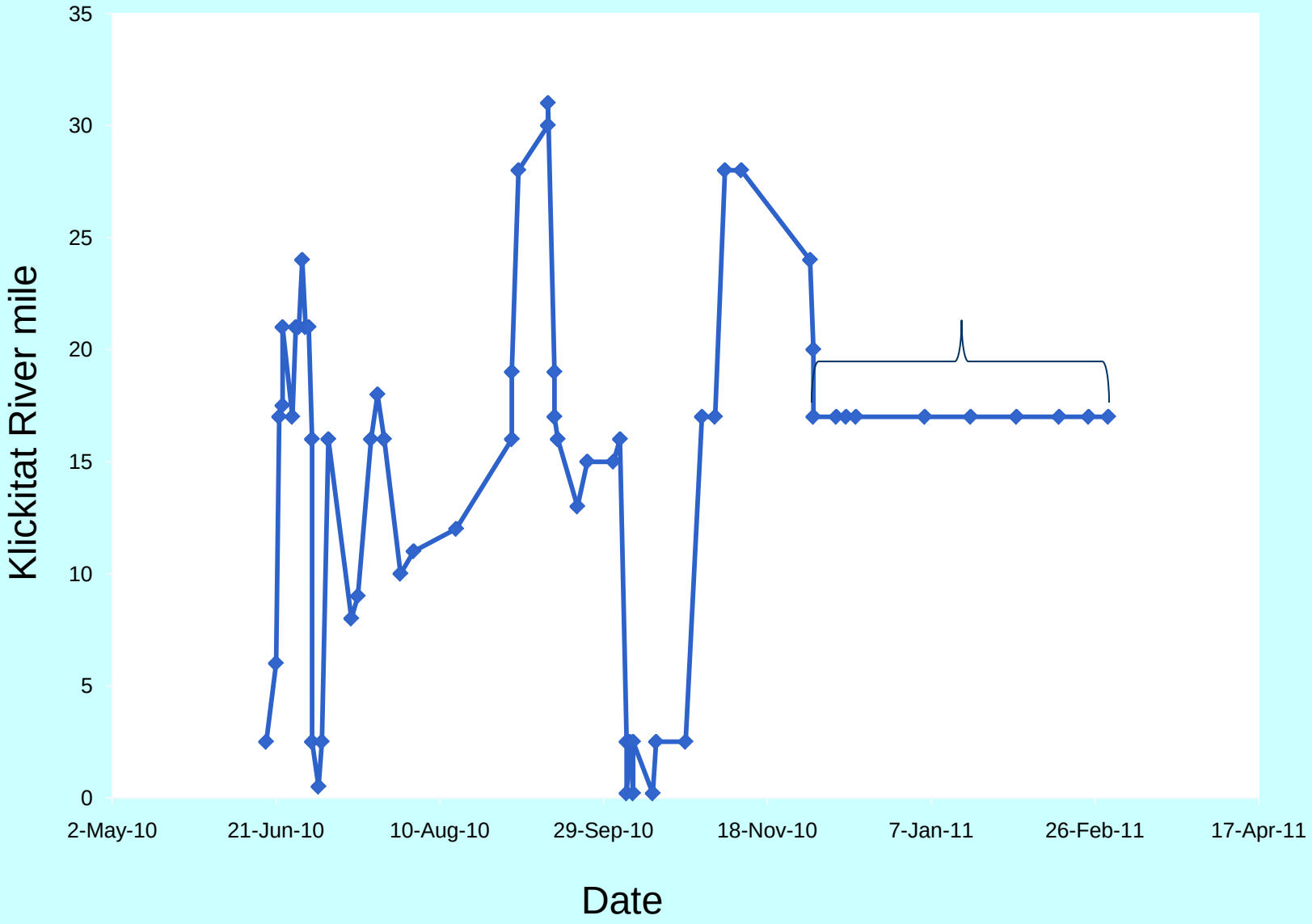
September 2009 – September 2010



Spawning migration of fish #36027



Spawning migration of fish #56136



Preliminary Results:
Fallback, Harvest, Pre-spawn mortality rates (% of N) *

Species & Origin	Fallback (Lyle Falls)	Re-ascension (Lyle Falls) - % of Fallback	Pre-spawn Mortality	Harvest
Wild Steelhead (N=73)	41%	13%	11%	10%
Hatchery Steelhead (N=31)	45%	21%	6%	52%
Wild Spring Chinook (N=16)	75%	33%	6%	0%
Hatchery Spring Chinook (N=38)	37%	21%	37%	11%

* Denotes only the fish that have “completed” spawning migration

Preliminary Results and Conclusions

- Relatively high fallback rates
  - Some tagging effects, especially Chinook?
- No indications of passage issues at Klickitat Hatchery weir
- “Dip-in” rate: 50% wild Chinook, 24% hatchery Chinook, 25% wild steelhead, 16% hatchery steelhead
- Spawning areas
  - High percentages of wild steelhead in Little Klickitat River and mainstem Klickitat River from Wahkiacus to Stinson Flats (river mile 16-30)
  - Hatchery steelhead enter tributary stream/spawn earlier than wild steelhead
  - Some potential overlap of wild and hatchery Chinook spawners
- Ongoing monitoring for next 2+ years

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