Fall Chinook Redd Counts Upstream of Lower Granite Dam

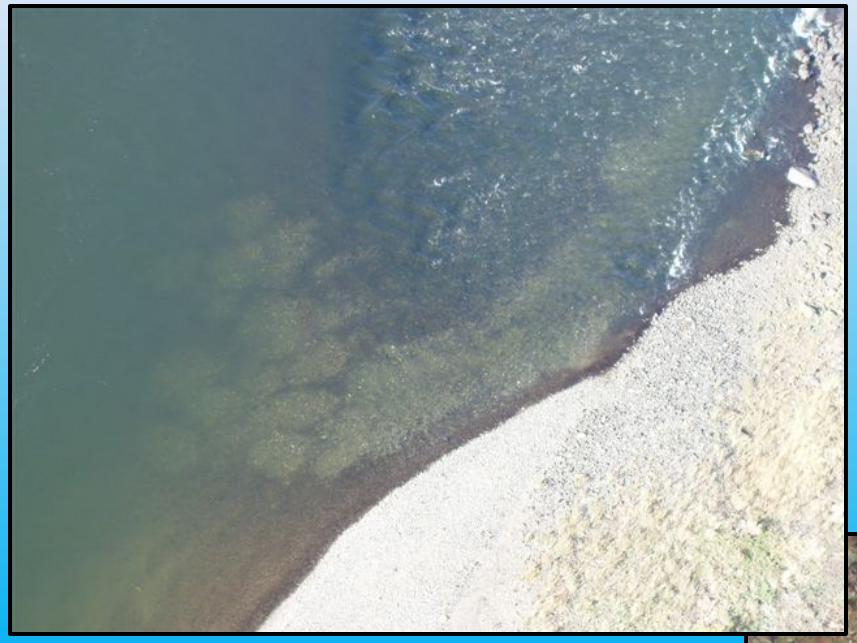
Phil Groves and Brad Alcorn
Idaho Power Company

How We Do It:

Aerial Surveys

How We Do It:

Remote Deep-water Video



This Is What We See (from the air)

And This Is What We See (in the deep)

But Why Do We Do These Things That We Do?

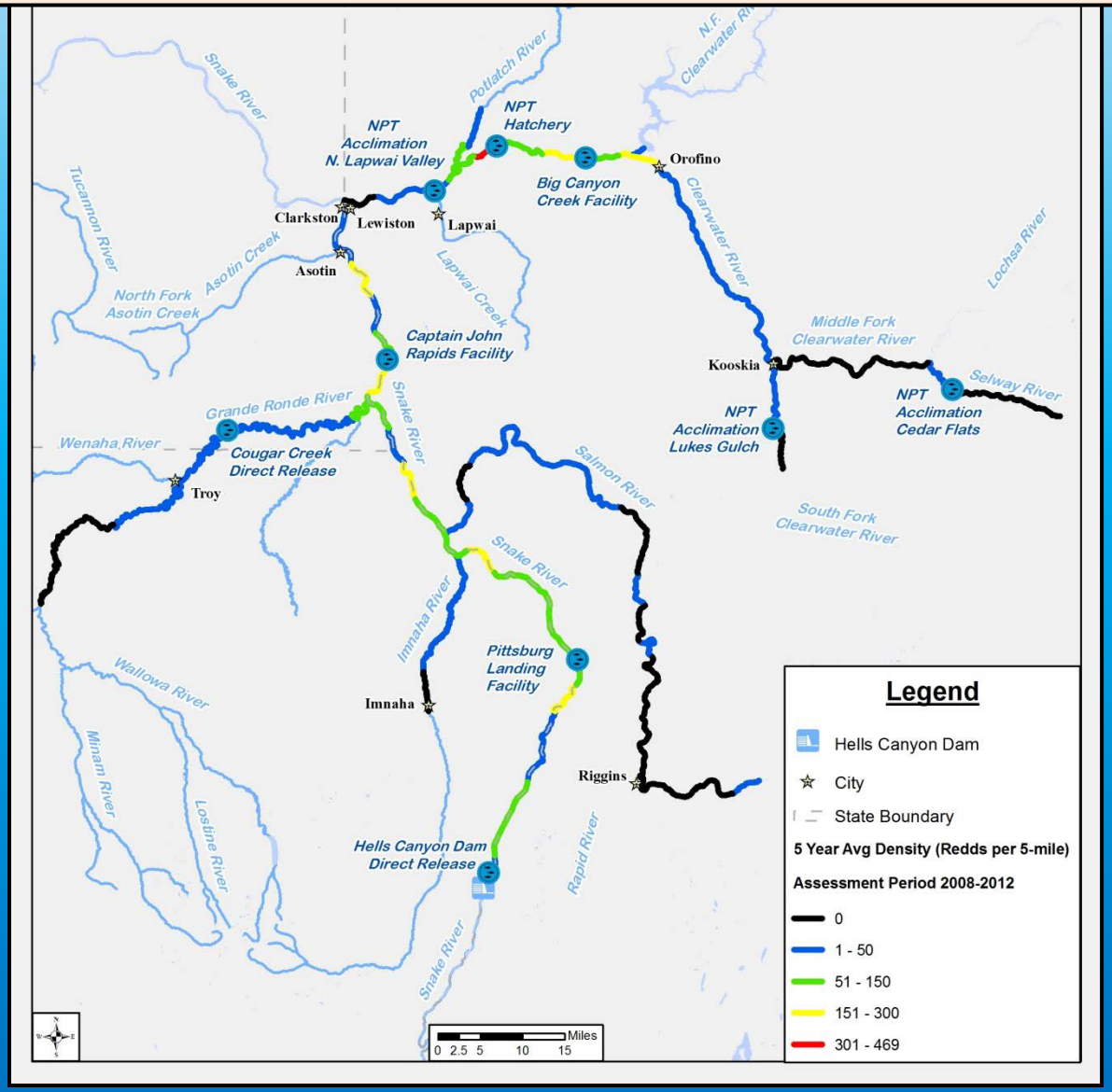
Identifying Critically Shallow Redds

(For Water Management Purposes)

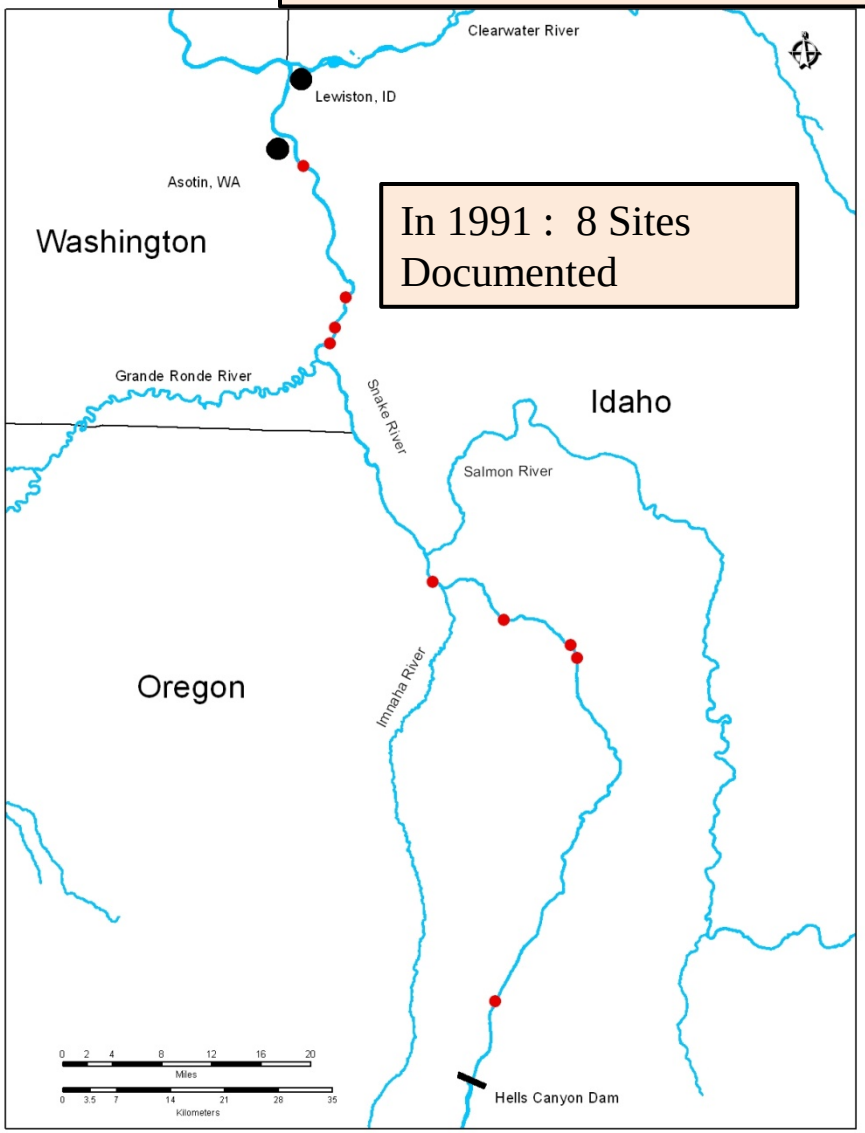
Identifying Critically Shallow Redds

(For Water Management Purposes)

Defining and Tracking Spawning Distribution

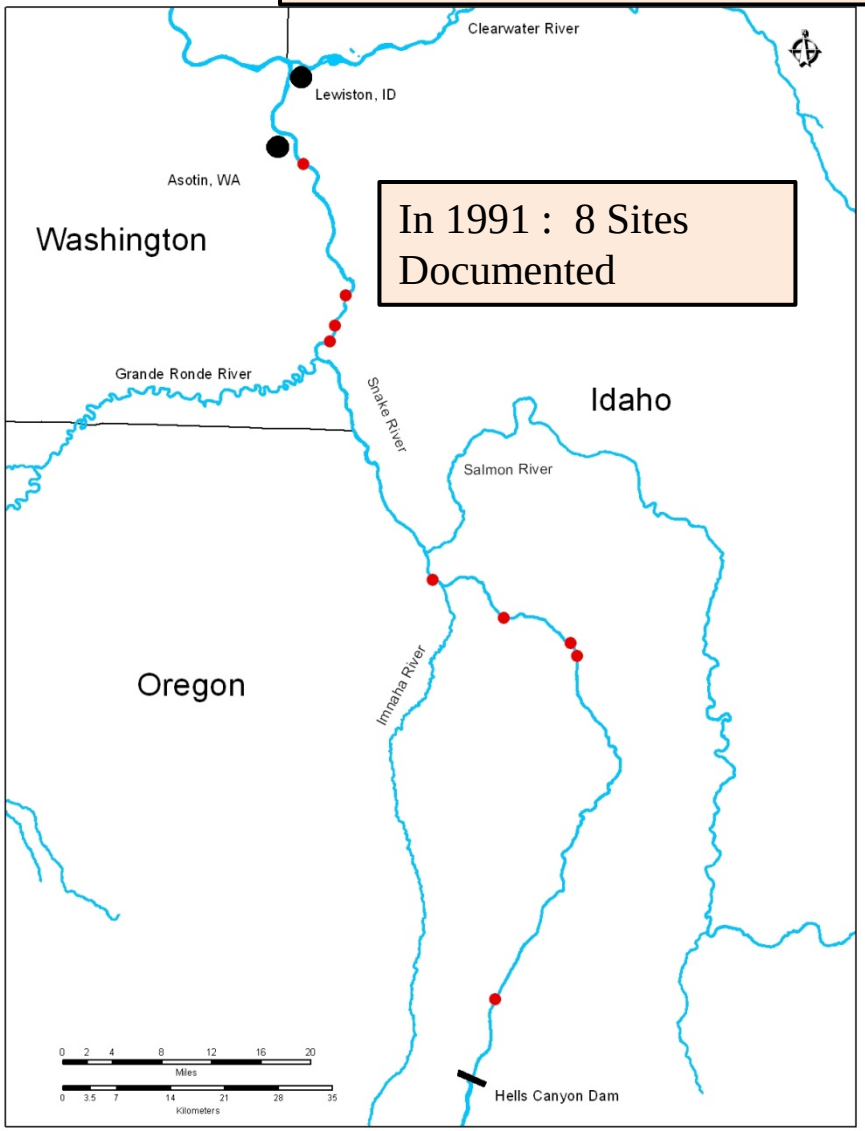


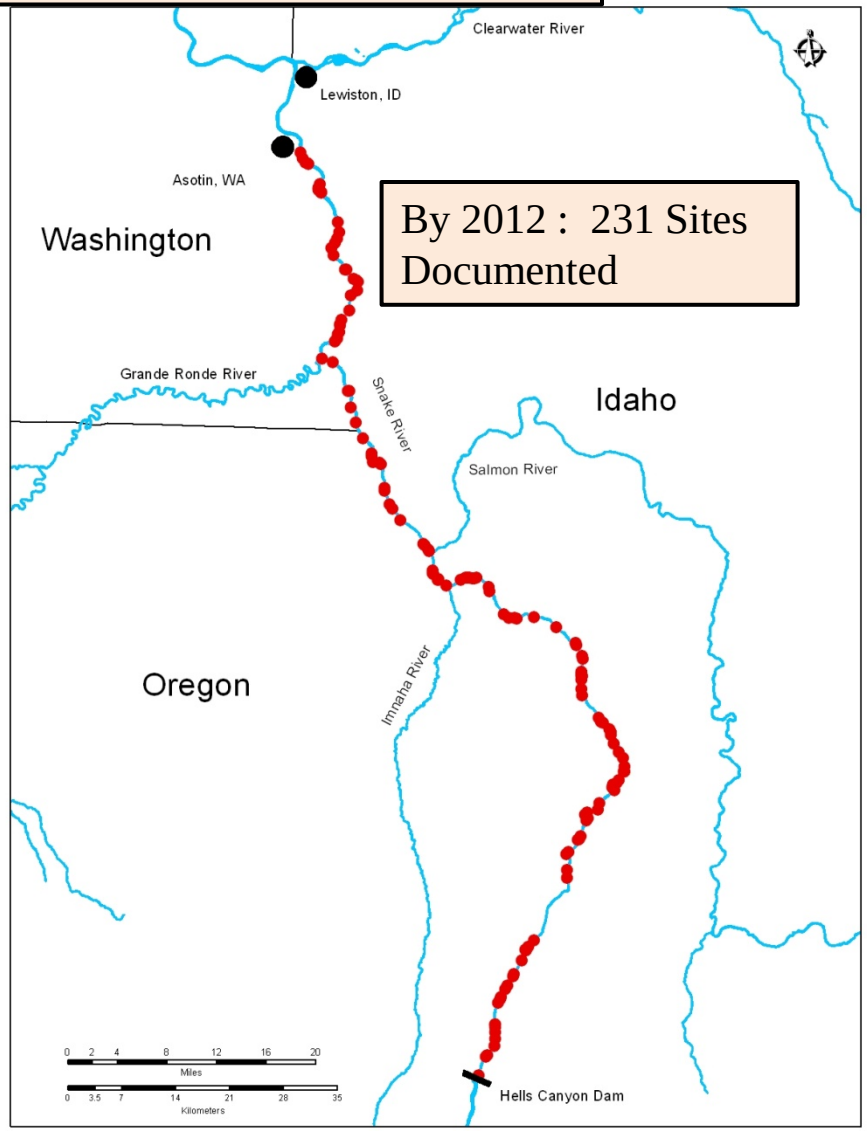
Defining and Tracking Spawning Distribution (another visual – Snake River only)



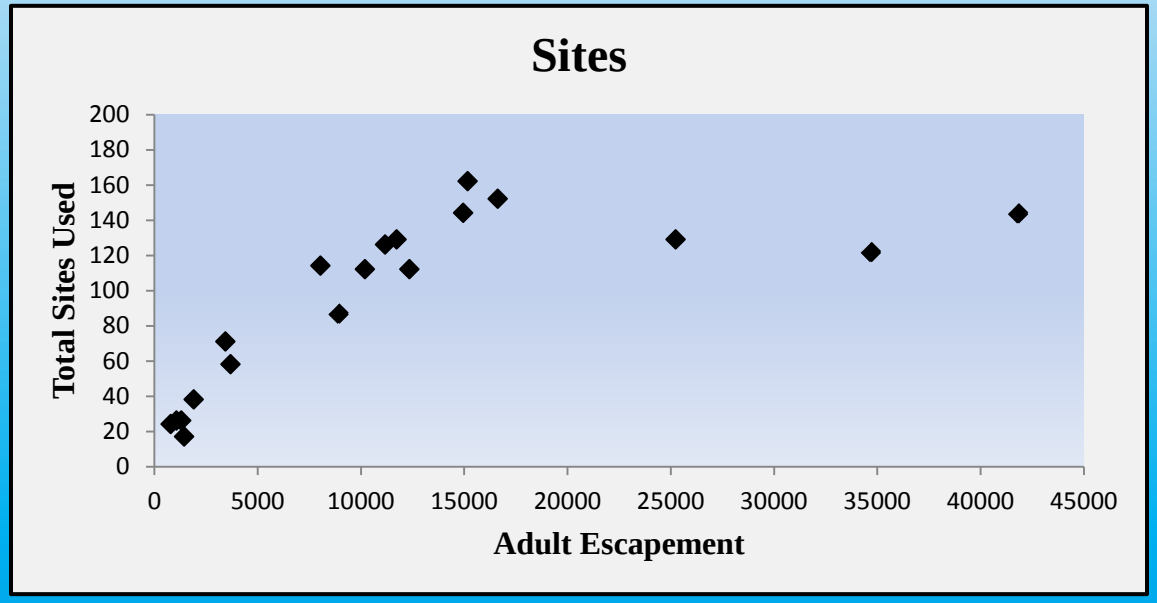
In 1991 : 8 Sites Documented

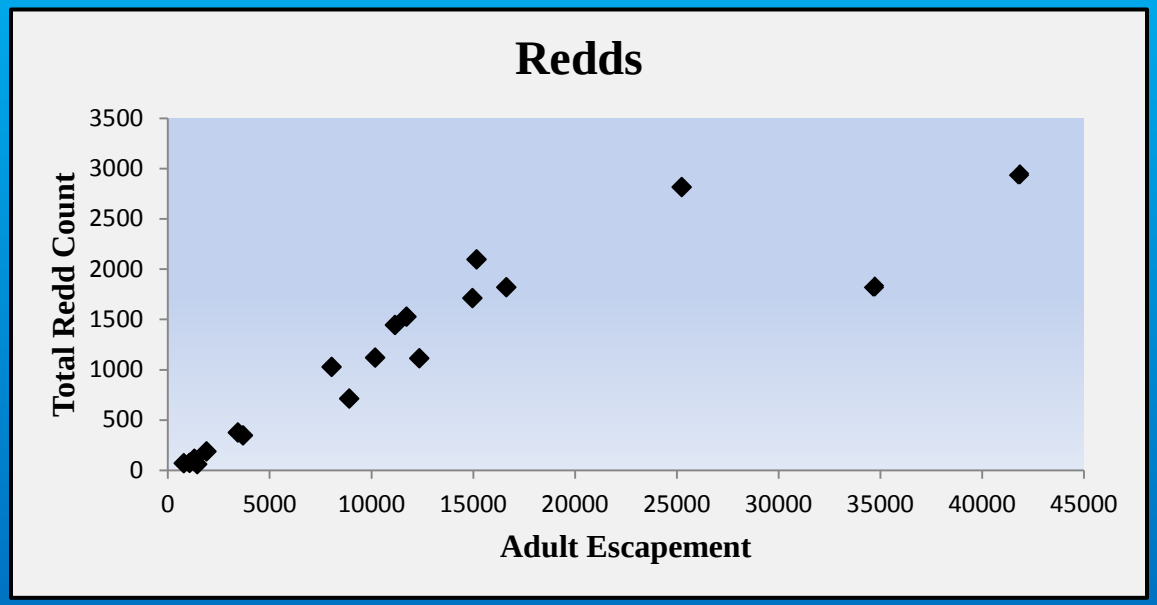
Defining and Tracking Spawning Distribution (another visual – Snake River only)





Identifying and Monitoring Trends





Defining Spawn Timing

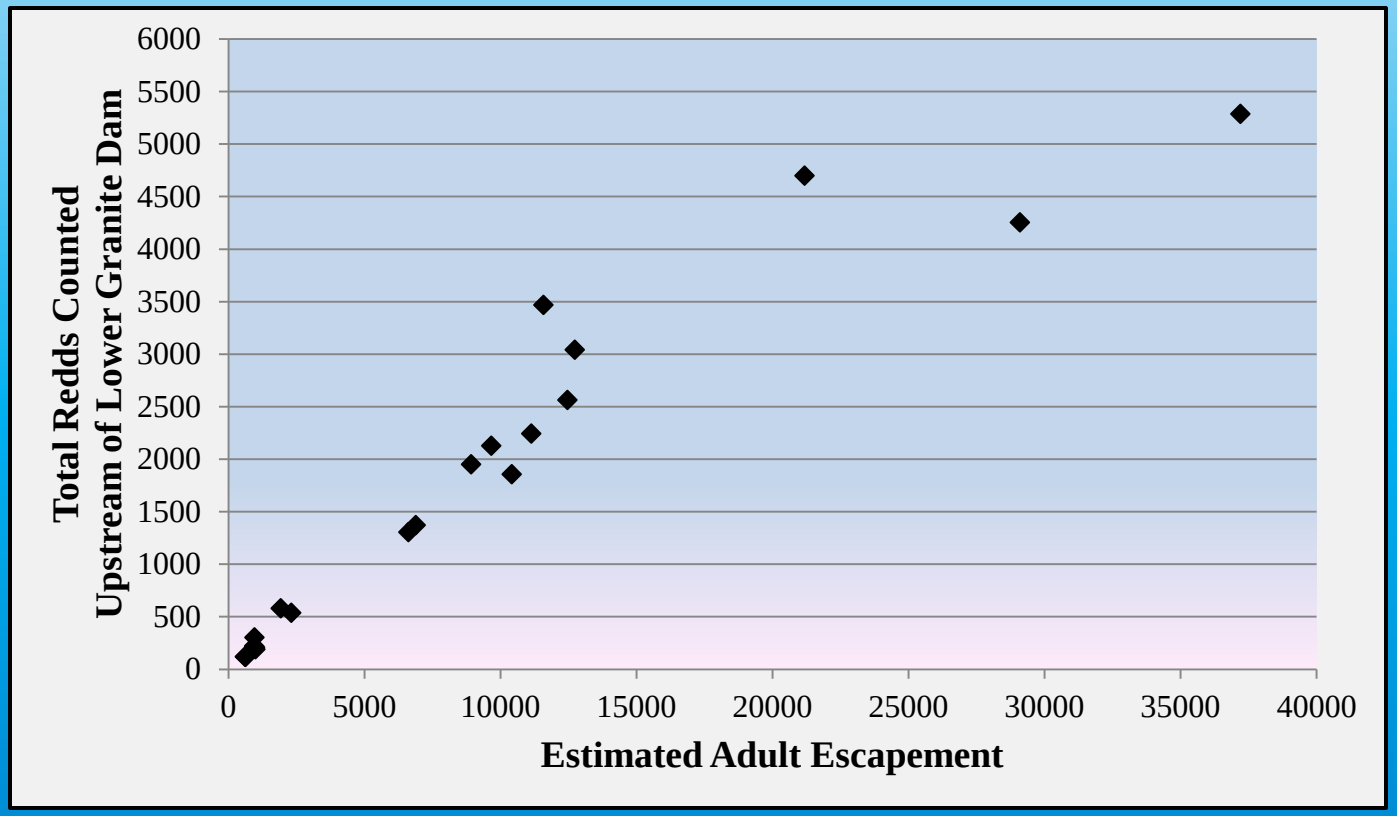
Clearwater tends to have an earlier initiation, but a similar peak in spawning as the Snake, Grande Ronde, Imnaha, etc.

Establishing Habitat Models

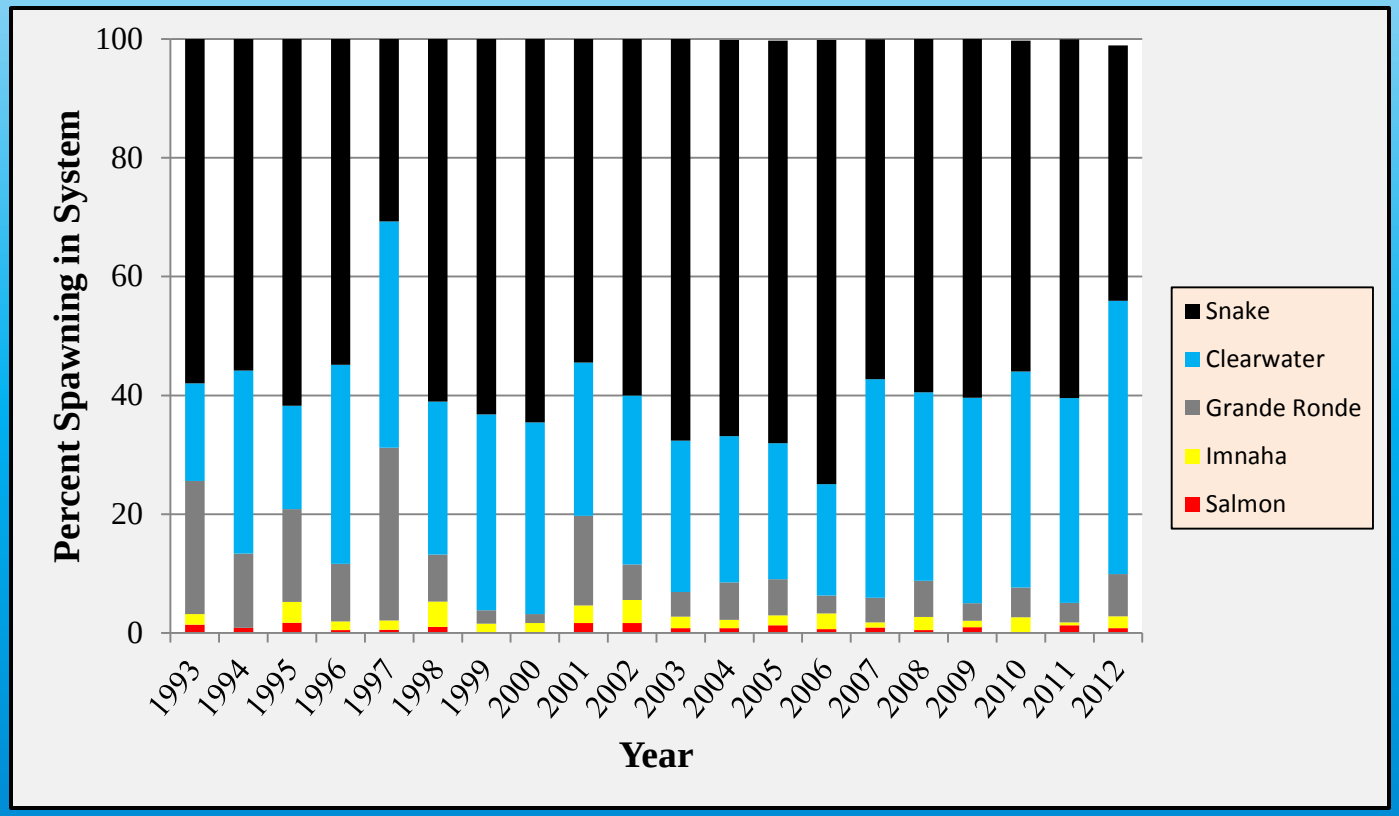
During early 1990's we used redd count data to help identify areas that could be used for modeling habitat quantity using an instream flow approach.

Let’s Look A Bit Closer At Some Of Those Trends:

Total Redds
Upstream of Lower Granite Dam,
as a Function of Adult Escapement



Percent of Spawning Within Individual Systems, Upstream of Lower Granite Dam

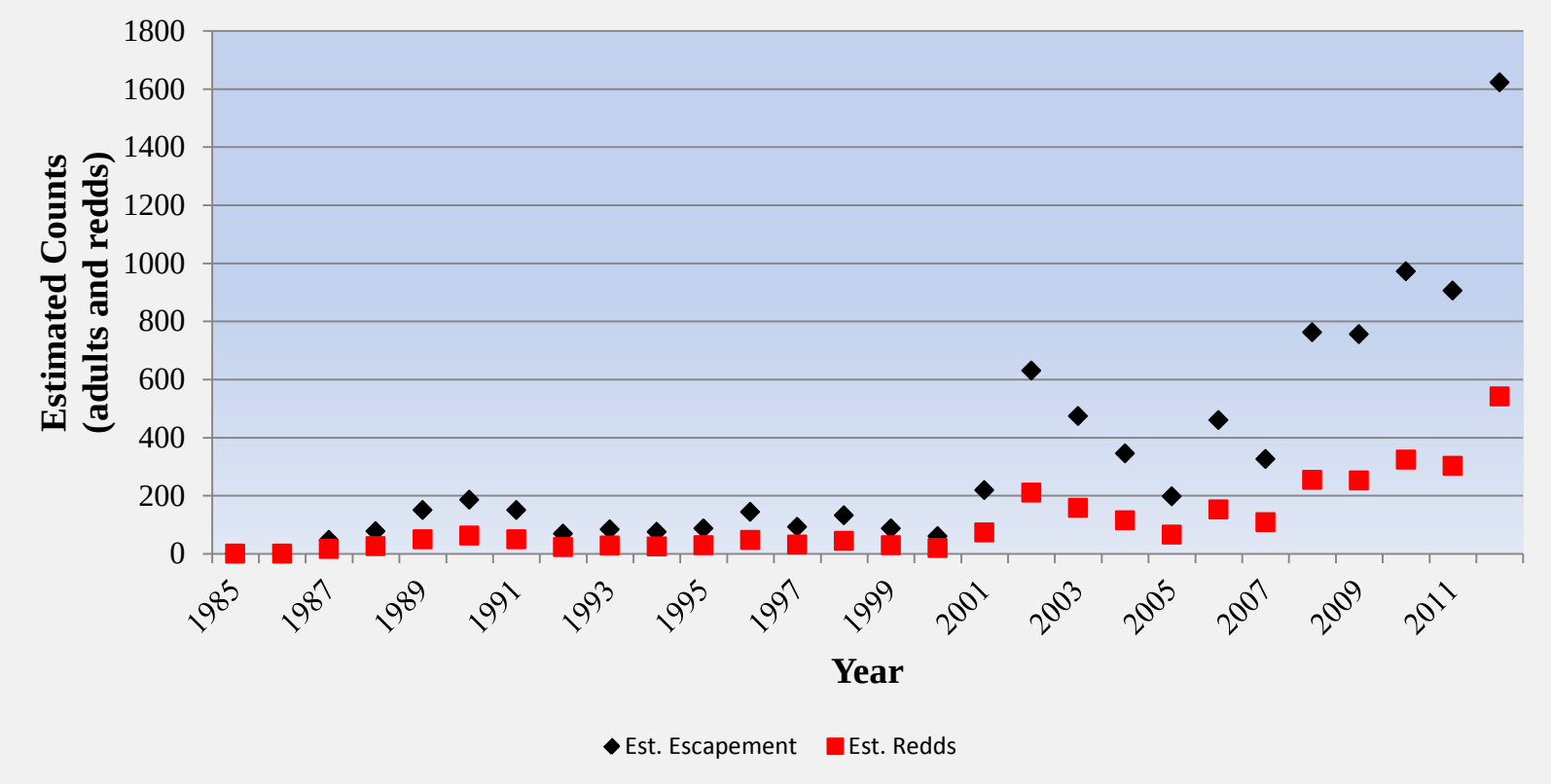


Percent of Spawning Within Individual Systems, Upstream of Lower Granite Dam

Another Way to Illustrate this Trend, Mean Percent of Spawning (1993 – 2012):

Salmon:	**1**	**(+/- 0.23)**
Imnaha:	**2**	**(+/- 0.47)**
Grande Ronde:	**9**	**(+/- 3.15)**
Clearwater:	**30**	**(+/- 3.31)**
Snake:	**59**	**(+/- 4.11)**

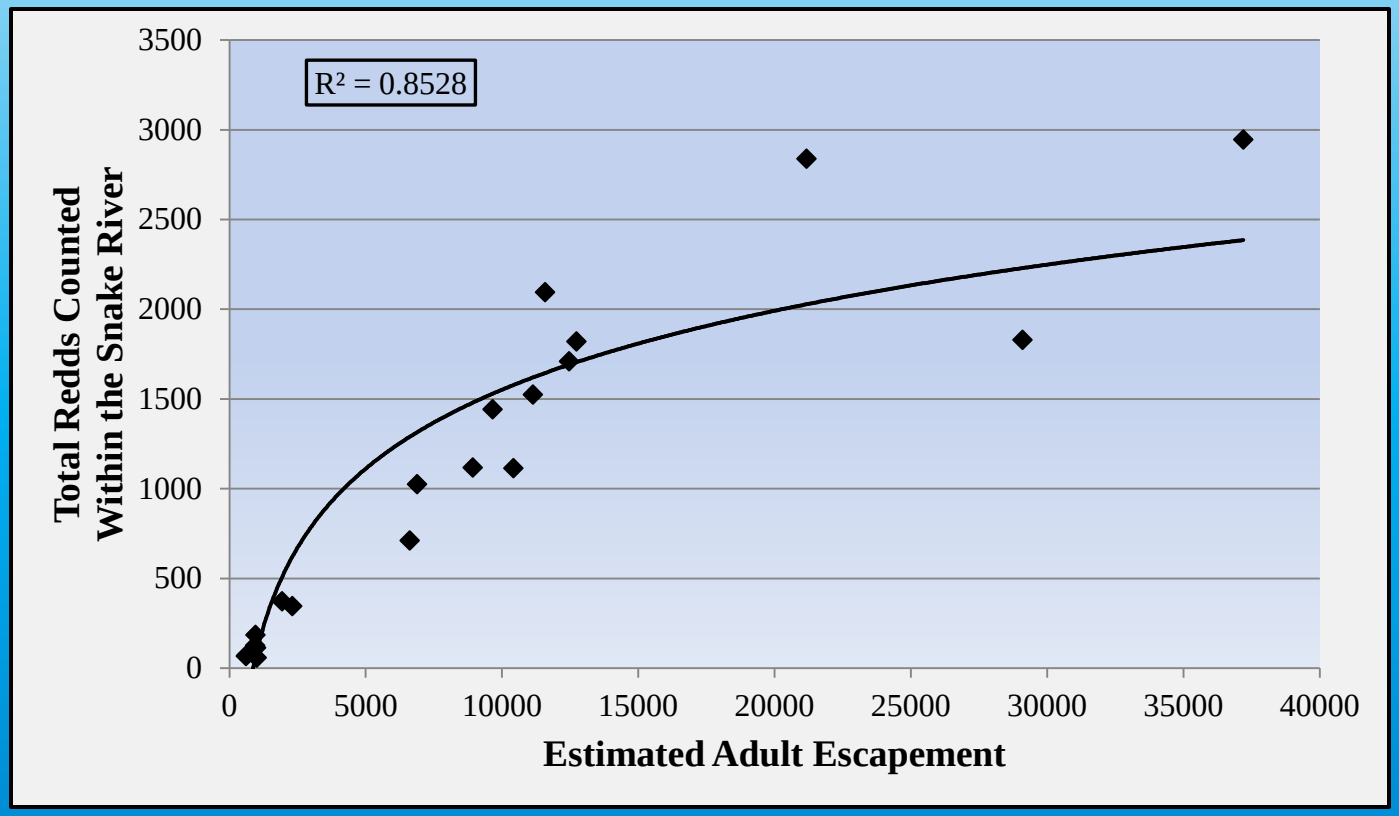
Estimated Adult Escapement, and Redds Within the Tucannon River: 1985 - 2012



As a percentage of the entire Snake Basin, the Tucannon has averaged about 8% of total spawning

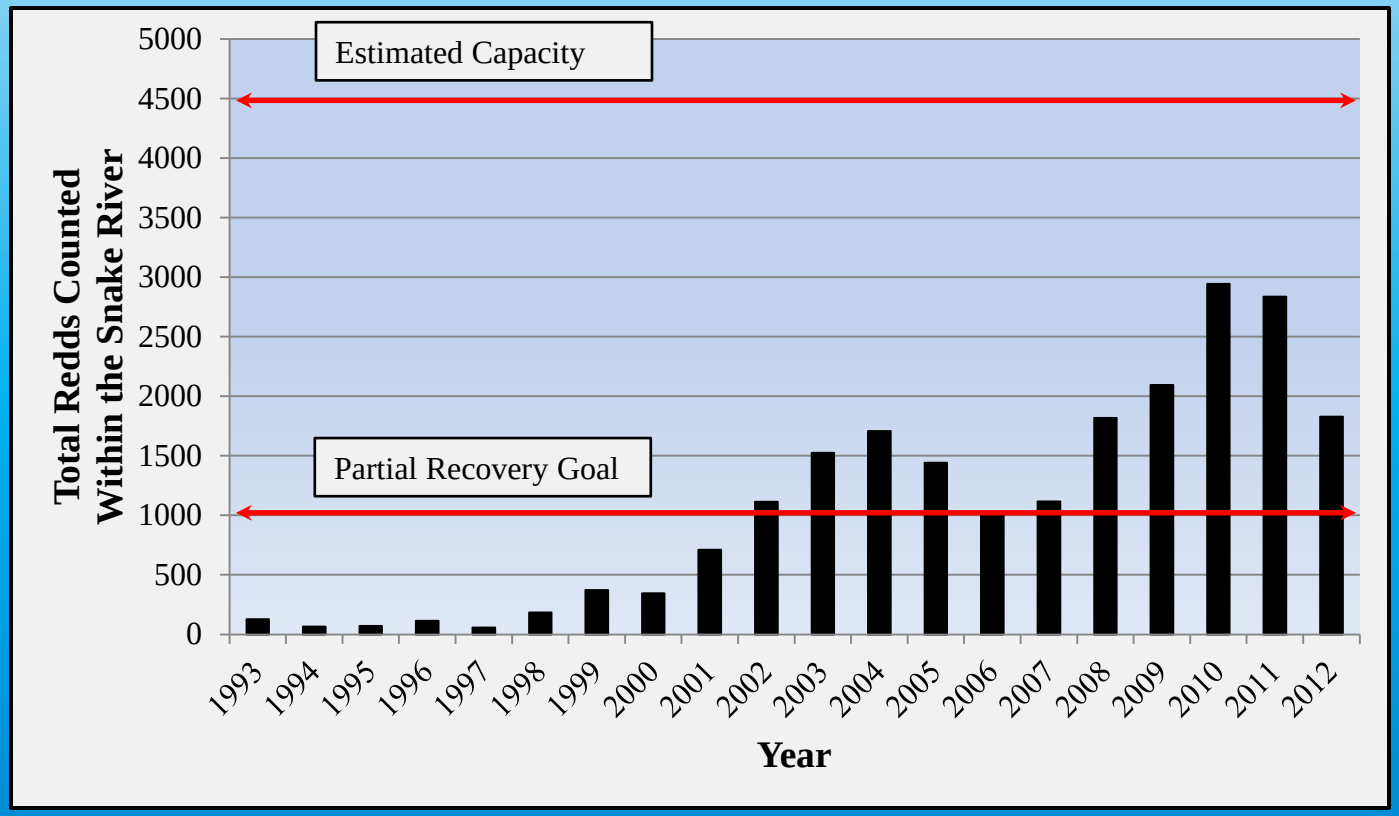
Now Let's Focus Only on the Mainstem Snake:

Total Redds Within the Snake River, as a Function of Adult Escapement



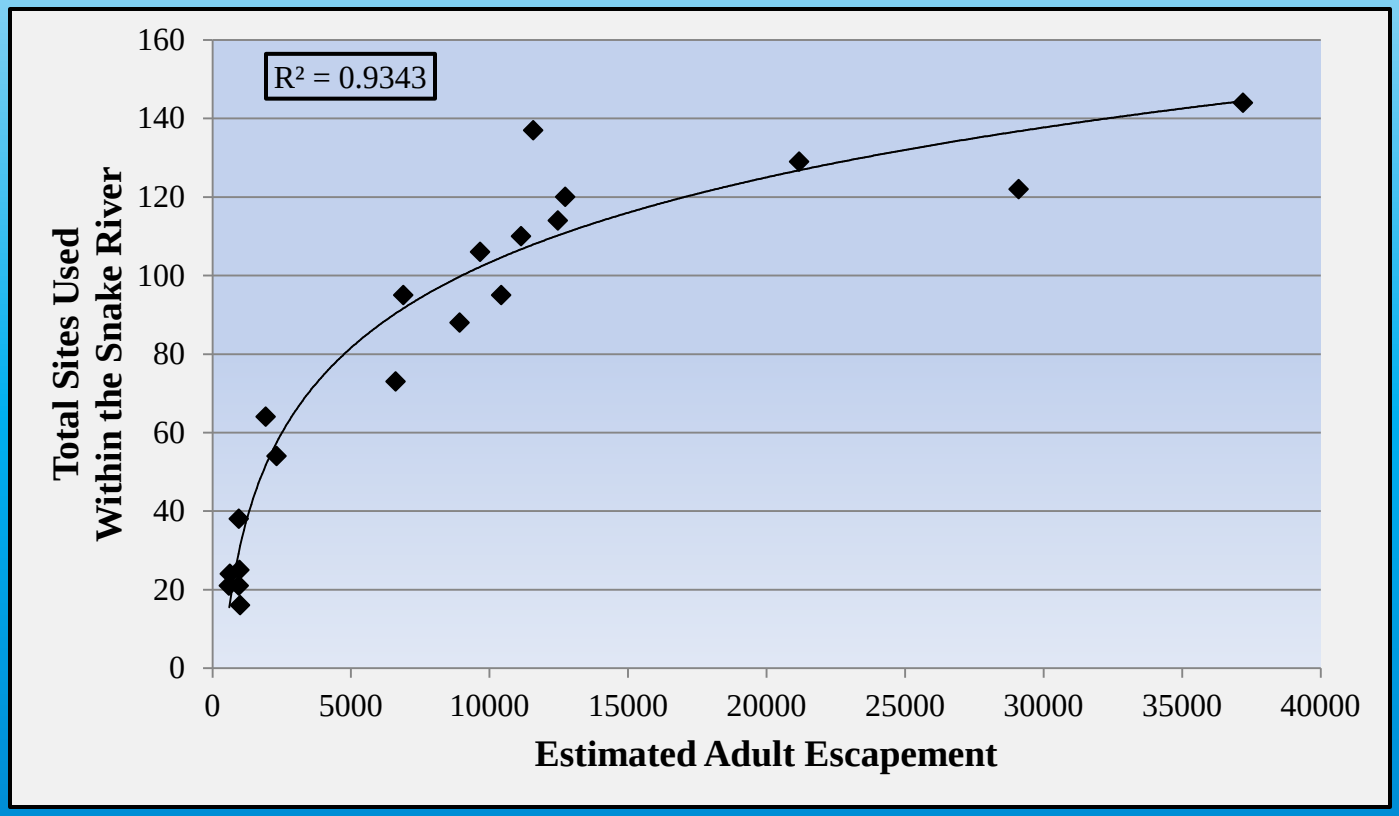
Groves, et. al. 2013, NAJFM

Another Way to Evaluate Total Redds Within the Snake River



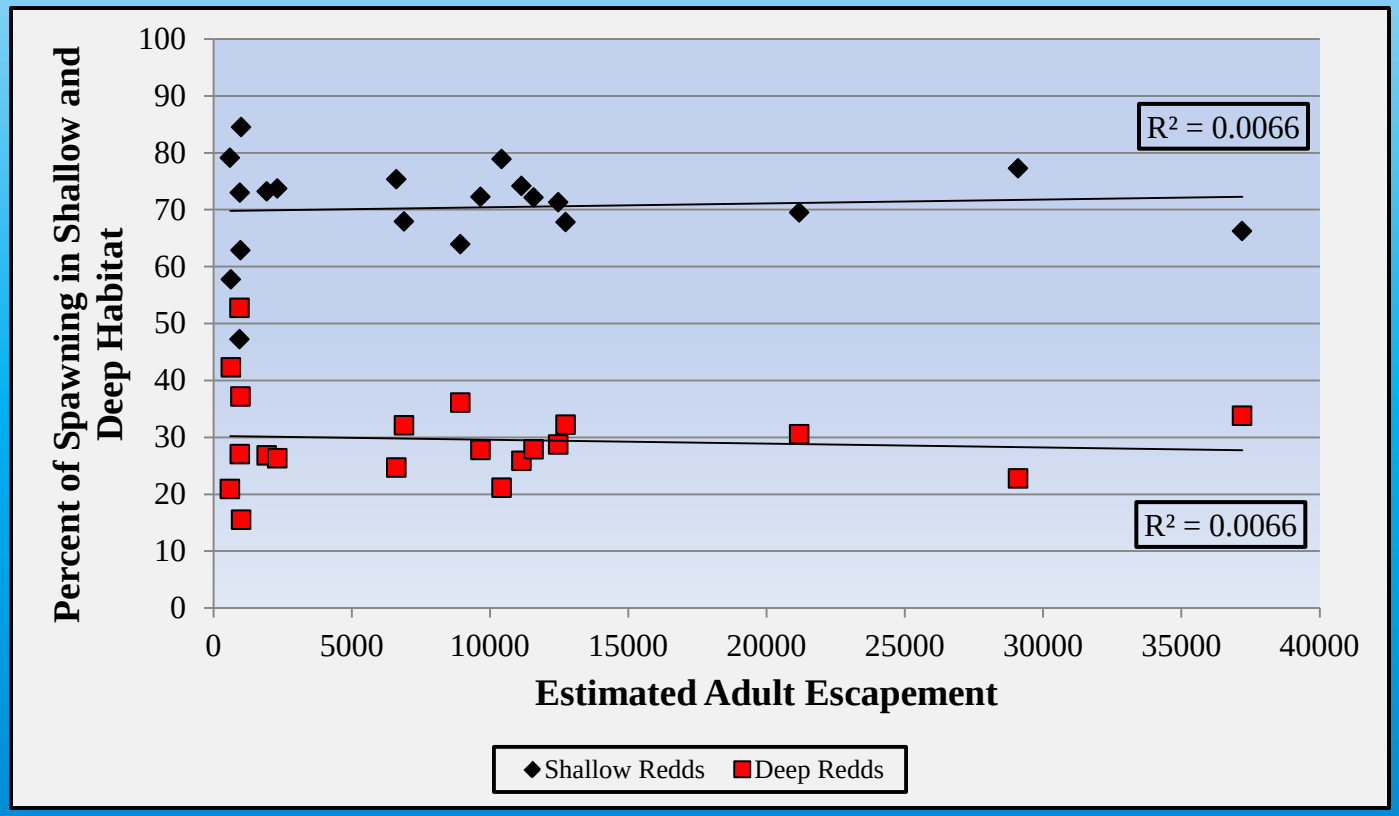
The number of redds used for partial recovery is based on the requirement for 2500 natural origin adults spawning in the Snake River, and the assumptions that 1 female makes one redd, and the female to male ratio is 1.0 : 1.5

Total Sites Used Within the Snake River, as a Function of Adult Escapement

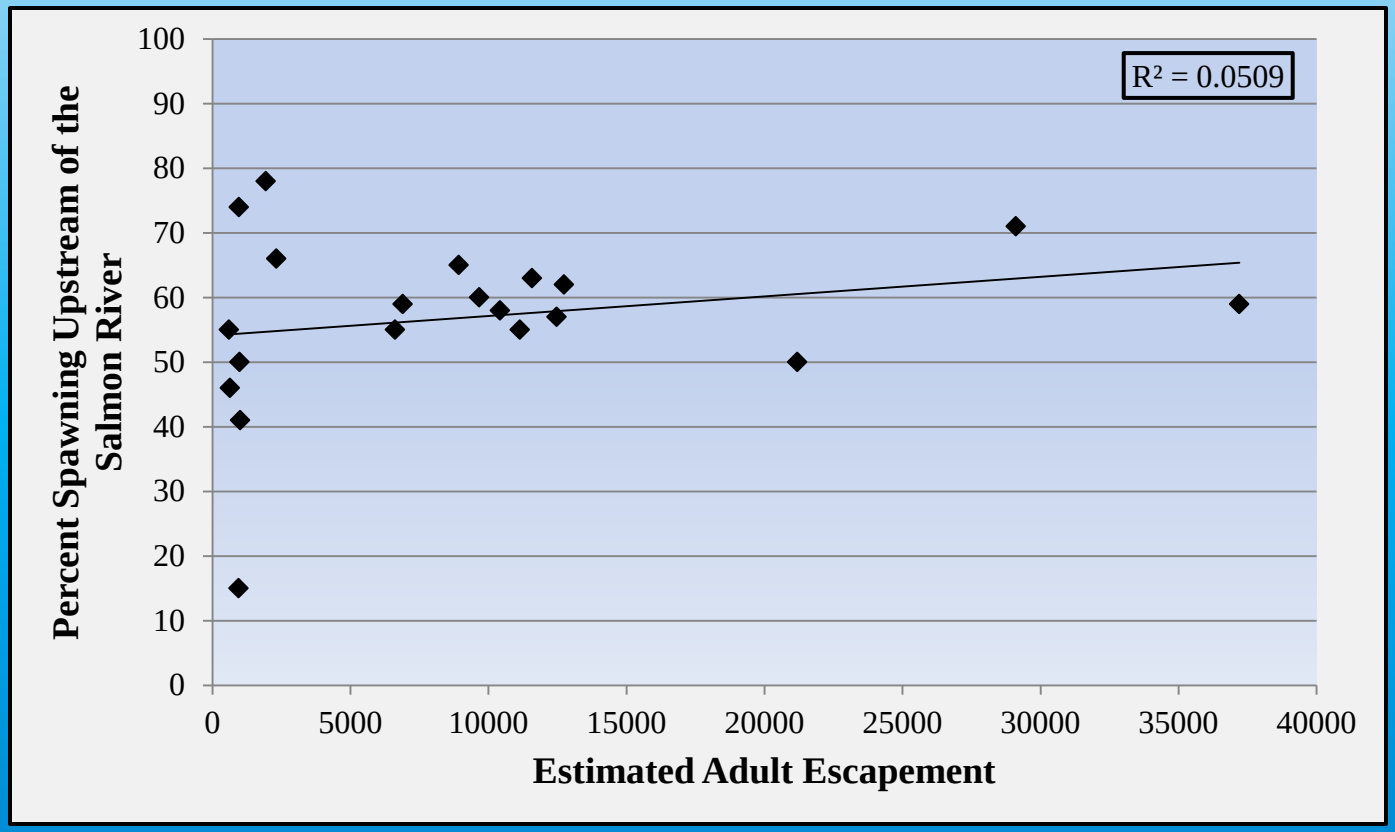


Interesting Note – During the 21 Years of Surveys We Have Identified 231 Distinct Spawning Locations. However, We Have Never Observed More Than 144 Sites Used During Any Single Year.

Percent of Spawning that Occurs in Shallow and Deep Habitat (Snake River only)



Percent of Spawning that Occurs Upstream of the Salmon River



What Will the Future Look Like?

1. Due to safety, reduced number of helicopter surveys (since 2010)

2. Due to safety, integrating unmanned airsystem for data collection

3. Moving away from complete aerial census to estimates

4. Concern over superimposition of redds (loss of production?)

5. Approaching an estimated "carrying capacity" (can we get to the levels that the management agencies would like to see?)

What Information Do We Need ?
Counts ?
Superimposition ?
Distribution (Temporal, Spatial) ?