

Hatchery Origin Strays Within the John Day River Steelhead Spawning Population

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INTRODUCTION

- The John Day River supports a wild population of summer steelhead (*Oncorhynchus mykiss*) with no hatchery supplementation and is part of the Middle Columbia River summer steelhead Distinct Population Segment that was listed as threatened under the Endangered Species Act in 1999
- The introduction of eight dams and reservoirs in the lower Columbia and Snake rivers led to high juvenile mortality rates; one mitigation strategy to increase survival of salmonids has been mass juvenile transportation
- While the use of barges to transport smolts reduces mortality associated with turbines and vulnerability to predators, studies reveal the process may interfere with juvenile olfactory imprinting: a process necessary for returning adults to home to natal streams
- This study investigated whether or not reduced barging correlates with the number of hatchery steelhead straying into the John Day River basin (JDR)

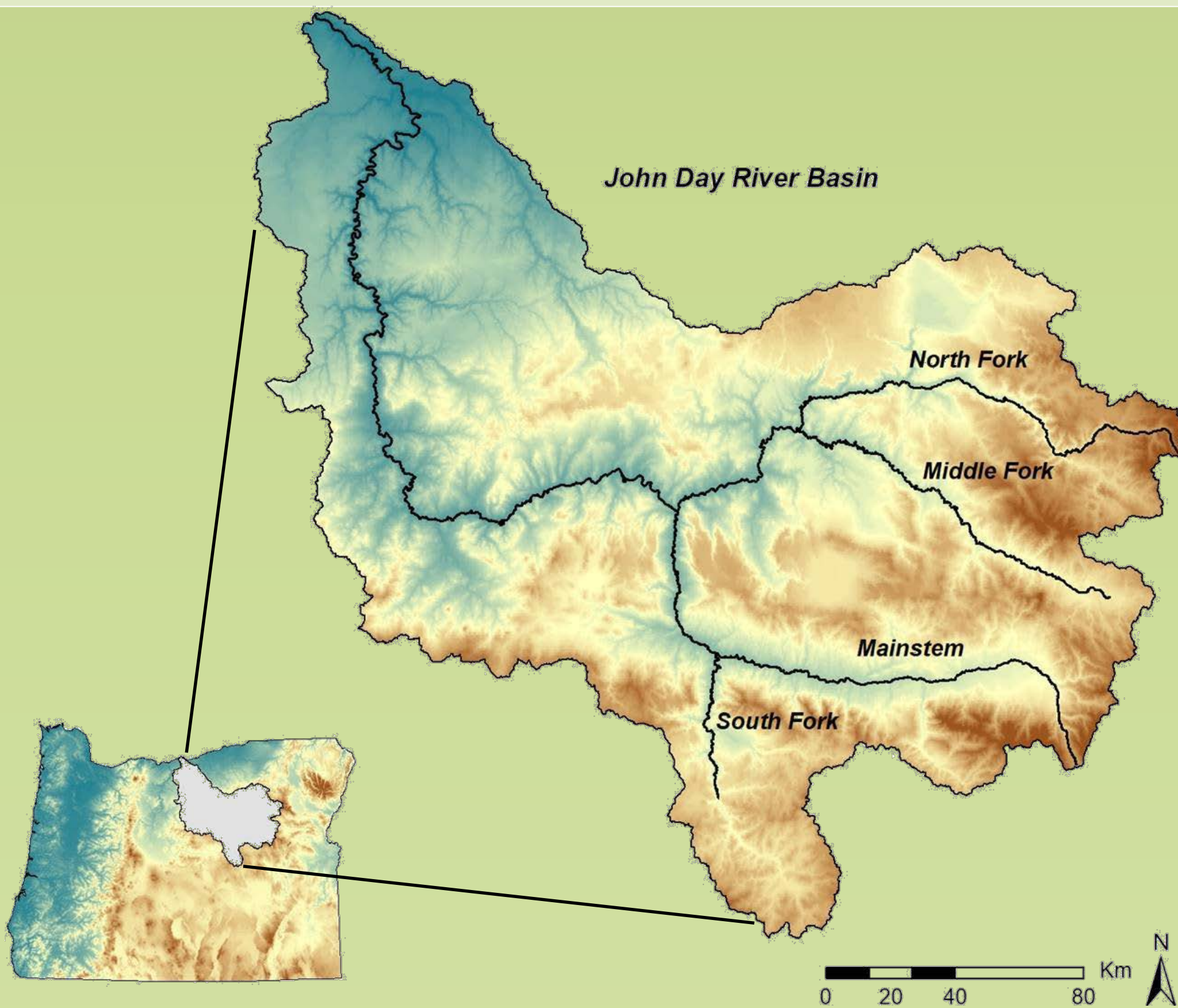


Figure 1. Map of the John Day River basin.

METHODS

- In addition to monitoring efforts that collect information on status, trends, and distribution of steelhead spawning activity in the JDR, we began documenting hatchery (adipose-clipped) strays in 2004
- We recorded the origin of adult steelhead observed during basinwide spawning ground surveys, angler surveys, beach seining, and rotary screw trap monitoring in the four subbasins
- To see if reduced barging of juveniles has had an effect on the percentage of hatchery origin spawners straying into the John Day population, we compared the hatchery fraction to percent barged hatchery steelhead two years prior to spawning year

RESULTS

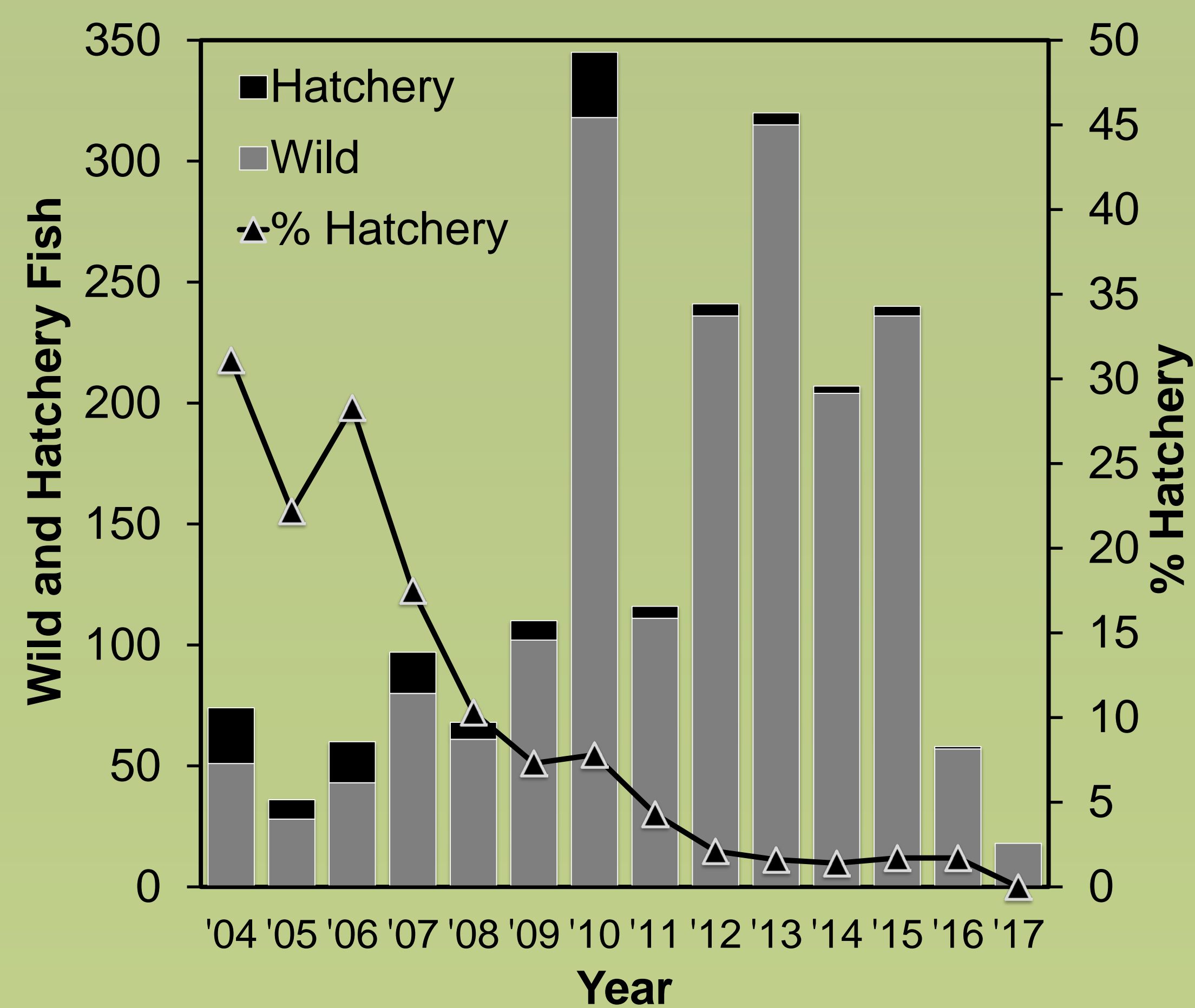


Figure 2. Wild and hatchery fish counts and percent hatchery origin spawners in the John Day River basin from 2004 through 2017.



Figure 3. Image of a wild steelhead ascending a cascade during a spawning ground survey on Thirtymile Creek.

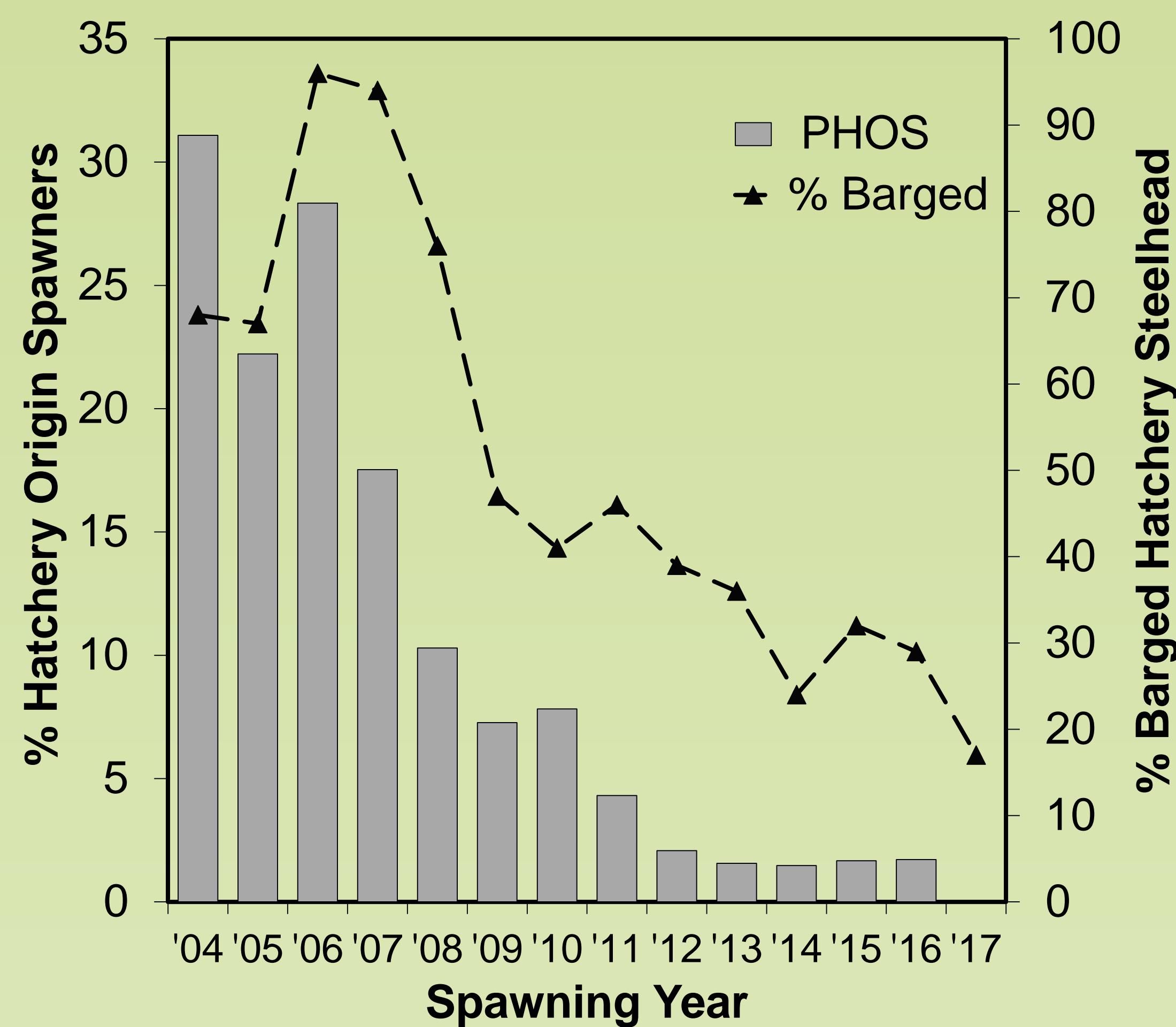


Figure 4. Proportion of hatchery origin spawners in the John Day River basin and the percentage of hatchery steelhead smolts transported from Lower Granite Dam (Snake River) two years prior to spawning year from 2004 to 2017.

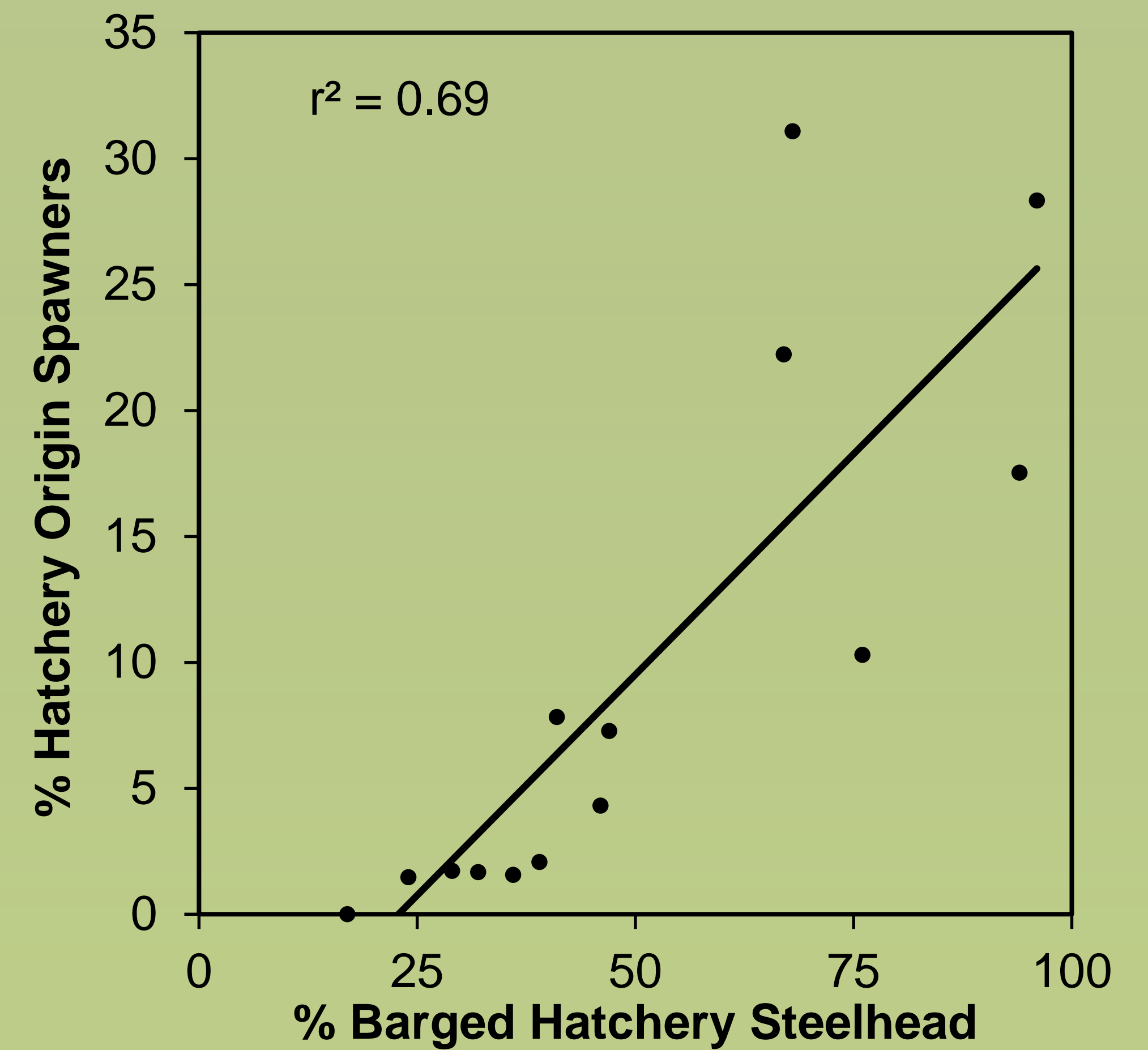


Figure 5. Relationship between the percentage of barged hatchery steelhead smolts and percentage of hatchery origin spawners observed in the John Day River basin from 2004 to 2017.

CONCLUSIONS

- Encounters with wild and hatchery adult steelhead during annual monitoring efforts has allowed us to document the long-term trends in the hatchery and natural adults returning to the basin to spawn
- Since 2008, there has been a decline in the proportion of hatchery-origin spawners in the John Day River summer steelhead Major Population Group
- The downward trend was preceded by declines in the proportion of Snake River hatchery steelhead smolts transported through the Columbia and Snake rivers
- The positive relationship between barged hatchery steelhead and straying hatchery origin spawners suggests that reducing hatchery steelhead smolt transportation in the Snake River is an effective strategy for reducing the proportion of hatchery-origin spawners in the John Day River basin

ACKNOWLEDGMENTS

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