

# **Steelhead supplementation in the Hamma Hamma River, WA: Minimizing genetic and ecological risks to the wild population**

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# LONG LIVE THE KINGS

Restoring Wild Salmon



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Lilliwaup, Hood Canal





## The Hamma Hamma River, Hood Canal

- Collaborative group working on the project: LLTK, HCSEG, WDFW, NOAA Fisheries, USFWS, PNPTC
- Hamma Hamma Steelhead Supplementation Project initiated in 1988
- Early goal to avoid genetic and ecological impacts to native Hamma Hamma steelhead
- Scientific evaluation funded in 2000

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**Hamma Hamma steelhead project planning**



## Typical western WA winter steelhead program:

- “Chambers Creek” hatchery winter steelhead
- Early entry and spawn timing relative to wild: hatchery fish spawn December – February, wild fish March – May
- One year smolt in hatchery, two year smolt in the wild
- Smolts out planted with little or no acclimation to the river planted

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### Typical Hatchery Steelhead Hatchery Program







**Hamma Hamma River steelhead program seeks to minimize potential hatchery effects**



- Sample redds rather than adults to get broad representation of the population
- Release smolts so as not to exceed the carrying capacity of the river
- Two release strategies:
  - 2 yr. smolt release group
  - 4 yr. adult release group

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## Measures to minimize risk







**Sample redds rather than adults**





**Sample redds rather than adults**

1998: 10 redds sampled, 90% contained eggs

1999: 11 redds sampled, 55% contained eggs

2000: 12 redds sampled, 75% contained eggs

2001: 5 redds sampled, 80% contained eggs

2002: no collection

2003: 28 redds sampled, 89% contained eggs

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**Sample redds rather than adults**



**Ave. number eggs  
collected per redd  
(range)**

1998: 520 (8-1164)

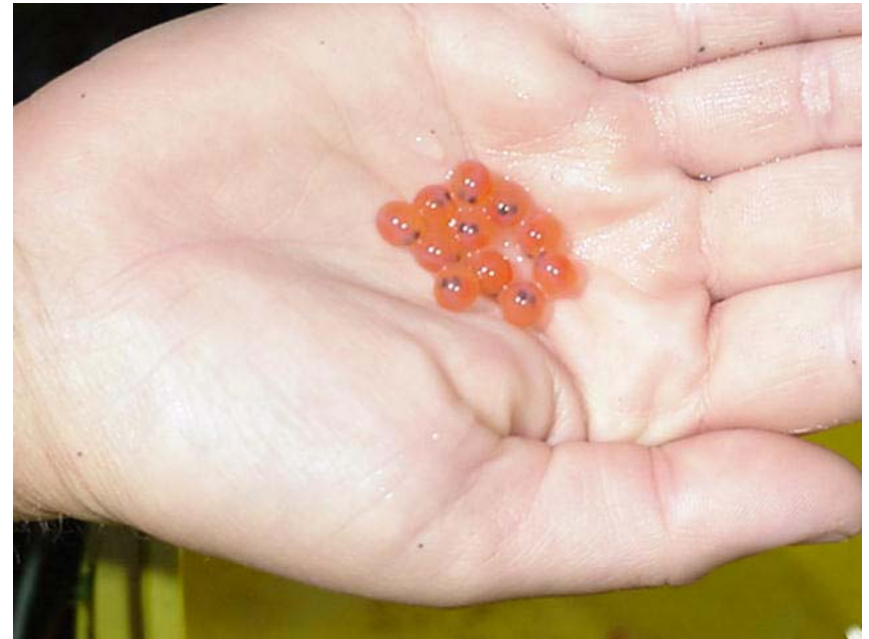
1999: 431 (77-619)

2000: 189 (11-425)

2001: 368 (298-673)

2002: no collection

2003: 147(11-306)



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**Number eggs per redd each year**





**Release smolts so as not to exceed the carrying capacity of the river**



# **Rearing strategies:**

## **Two year old smolts**

- \*circular fiberglass tanks at Lilliwaup

- \*natural pond at Johns Creek, Hamma

## **Four year old adults**

- \*circular fiberglass tanks at Lilliwaup



Two year old smolts – incubation at Lilliwaup





Two year old smolts – start tanks at Lilliwaup





Two year old smolts – rearing tanks at Lilliwaup





Two year old smolts – incubation at Johns Ck





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Two year old smolts – start tank at Johns Ck





Two yr old smolts—original rearing pond at Johns Ck





Two yr old smolts – new pond at Johns Ck

- Use Snow Creek trap data for wild steelhead
- Feeding rates assumed 1:1 conversion rates
- Take known size of wild fish at a certain age or season, calculate amount of feed needed for gain in size desired.
- Feeding done until satiation, typically 3X/week
- Fish handled once a quarter, feed amount adjusted as needed

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**Feeding rates mimic wild steelhead smolts**







Adult release group

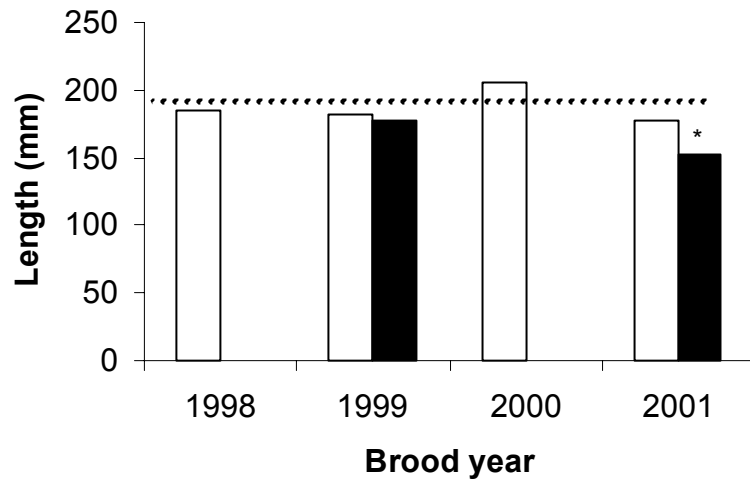
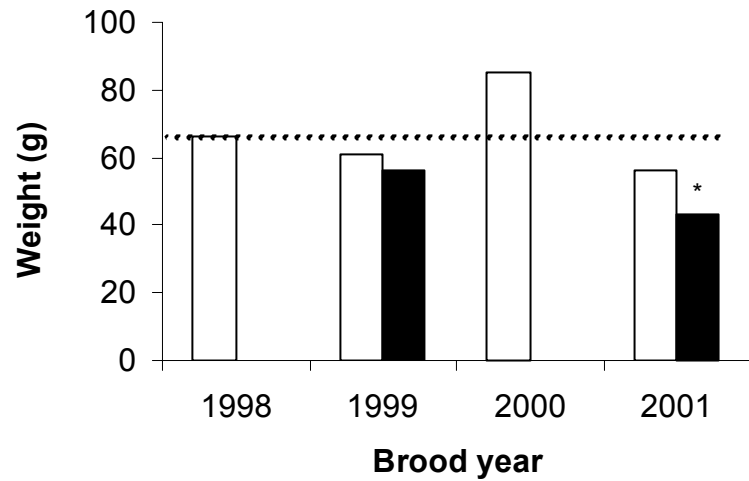




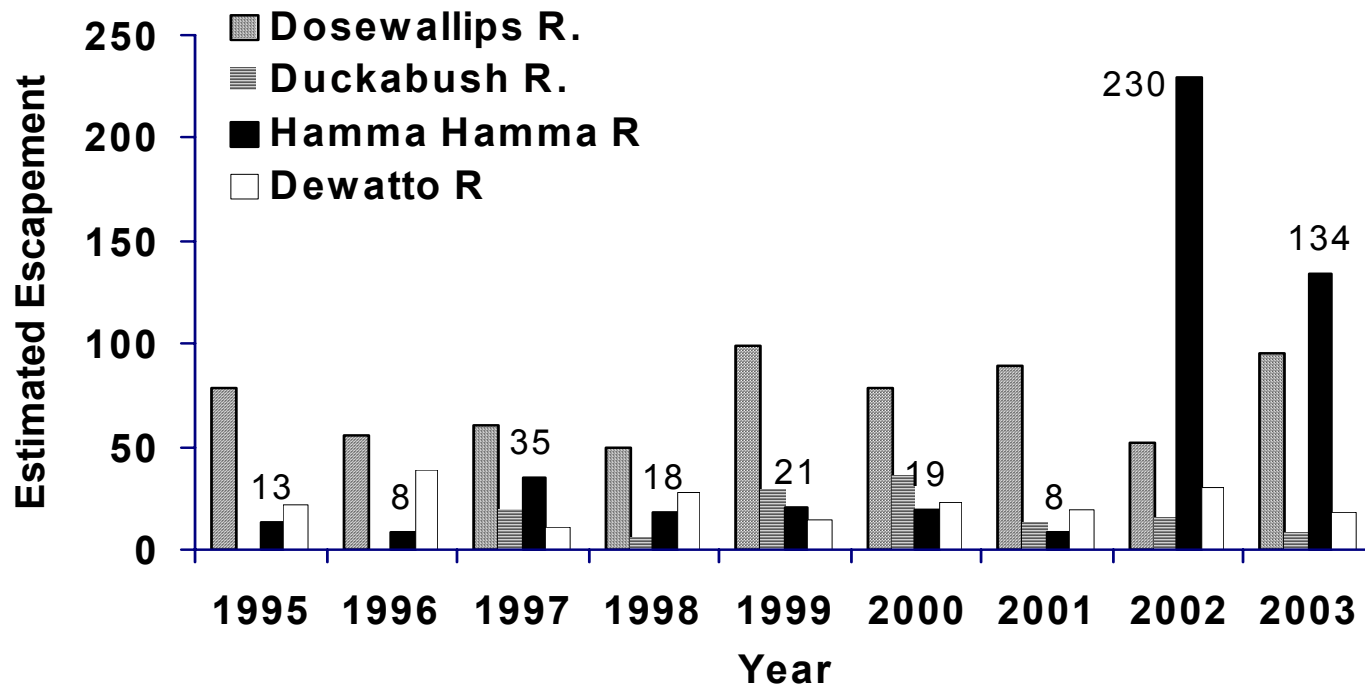
**BY 1998 release into the Hamma Hamma River  
28 February 2000**







2 year smolt release size



Estimated escapement of winter steelhead to Hood Canal Rivers





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## Conclusions







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