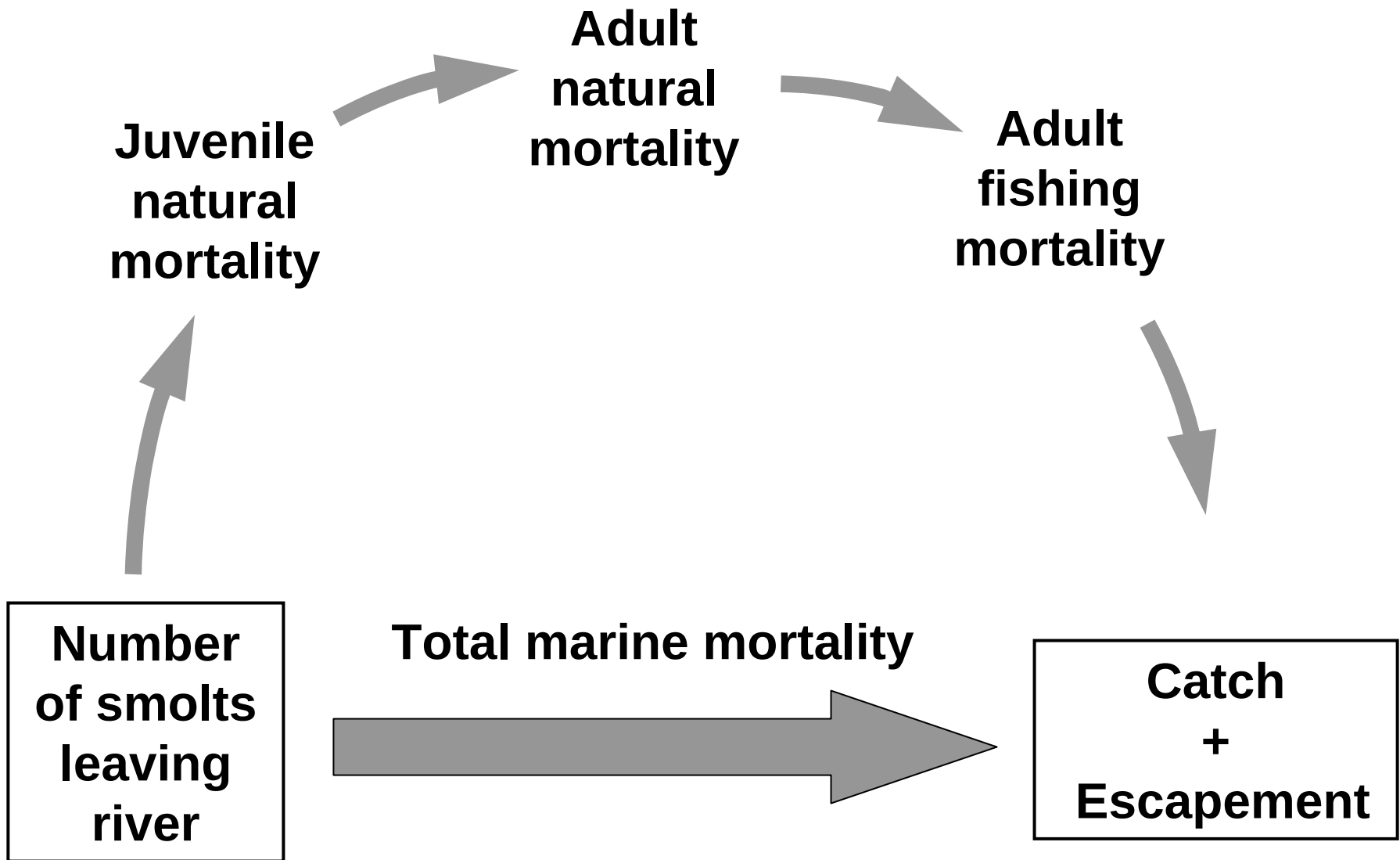


Steelhead smolt survival during the downstream and early ocean migration: effects of body size and migration distance

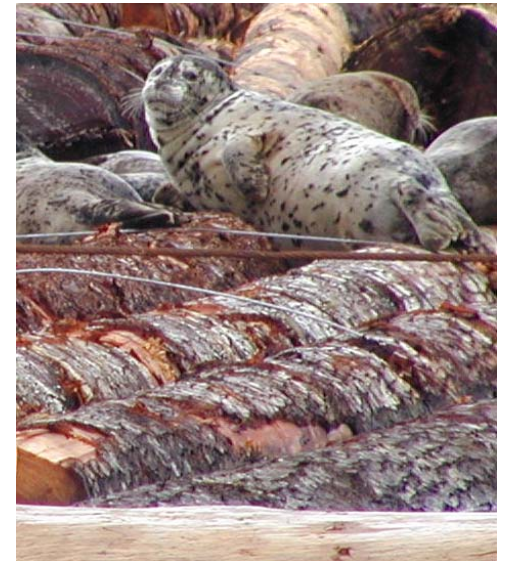
Michael Melnychuk, David Welch, Carl Walters





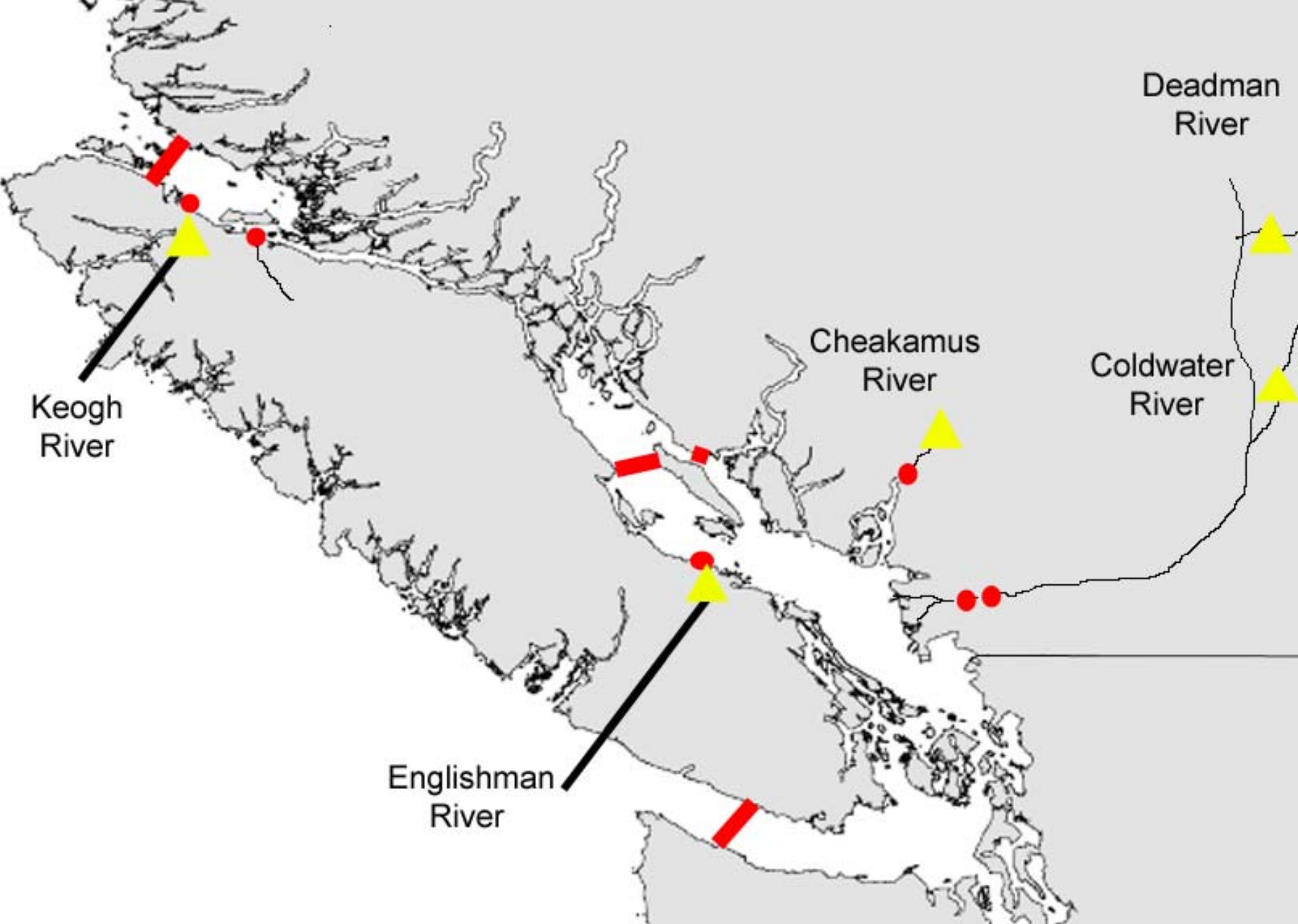
Marine mortality in steelhead trout

- Mortality rates during downstream and early ocean migration are probably high
- Growth vs. predation risk trade-offs
- Main groups of hypotheses for declines of total marine survival rates:
 - Reduced growth rates
 - Increased predation intensity



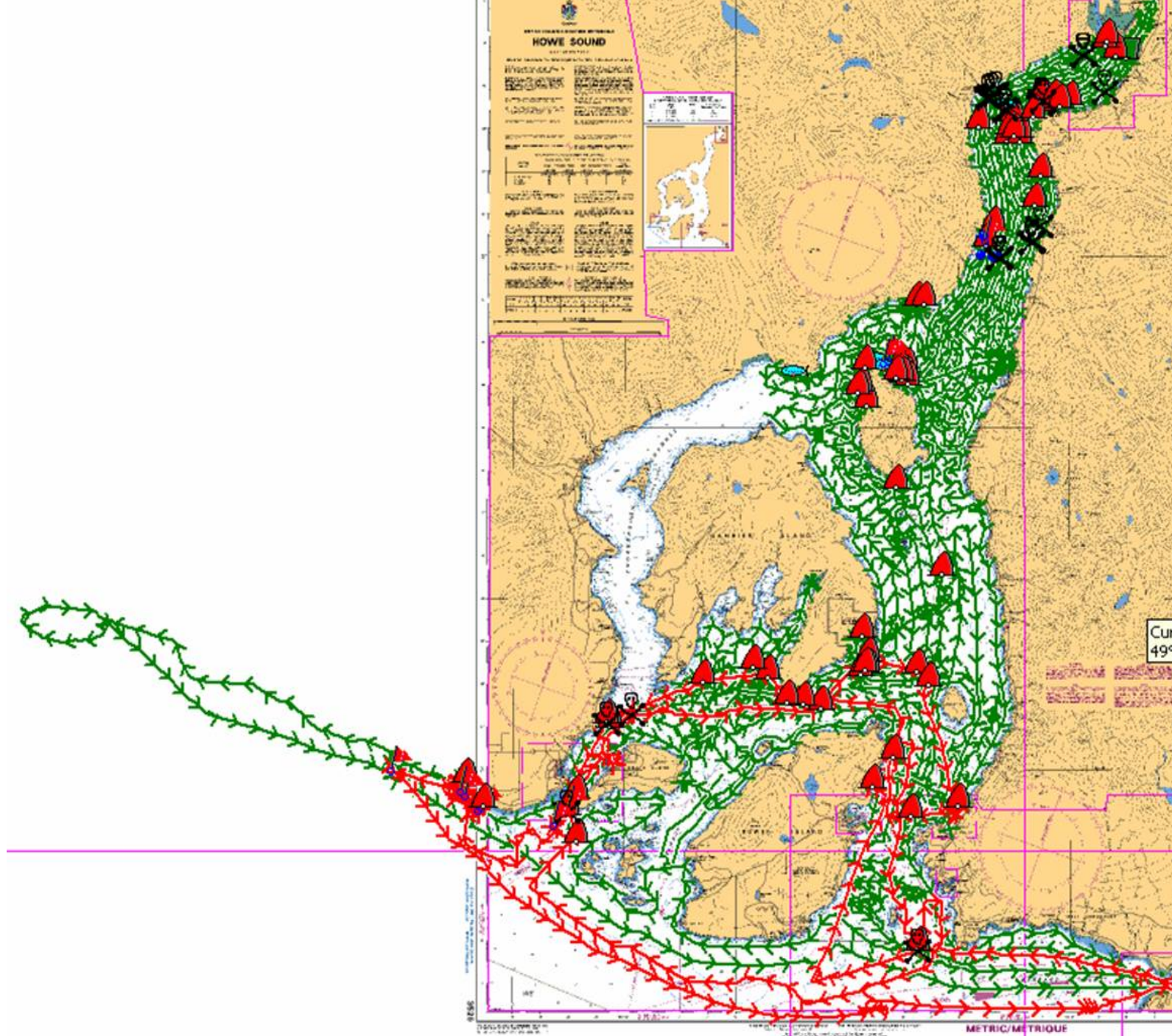


- Deployed array of VR2 receivers to cover >400 km of initial migratory routes
- Surgically implanted coded acoustic tags (69 kHz) into smolts during downstream migration
- Mobile tracking with VR-28 receiver/VFIN used on smaller spatial scale





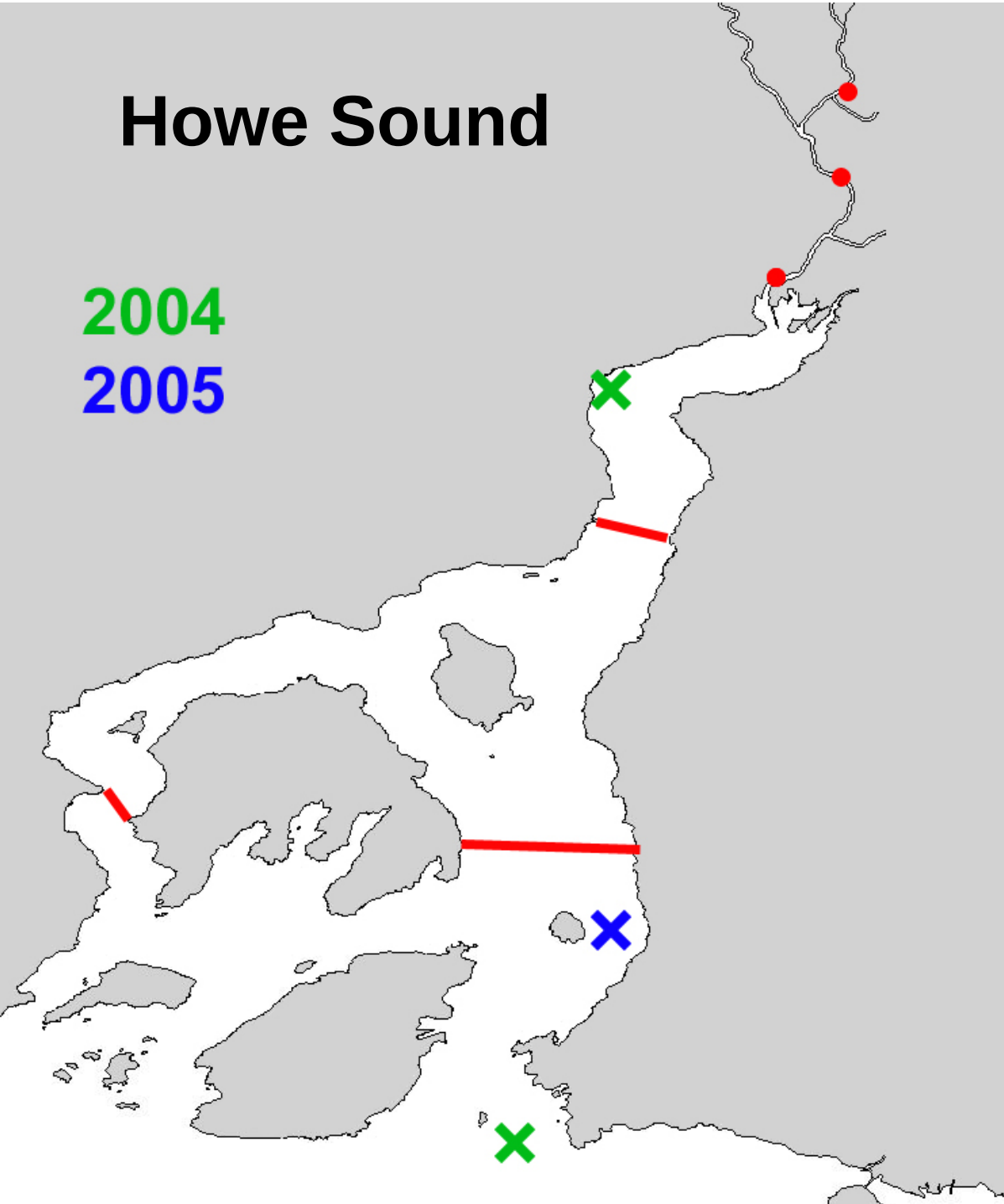
- Deployed array of VR2 receivers to cover >400 km of initial migratory routes
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Howe Sound

2004

2005



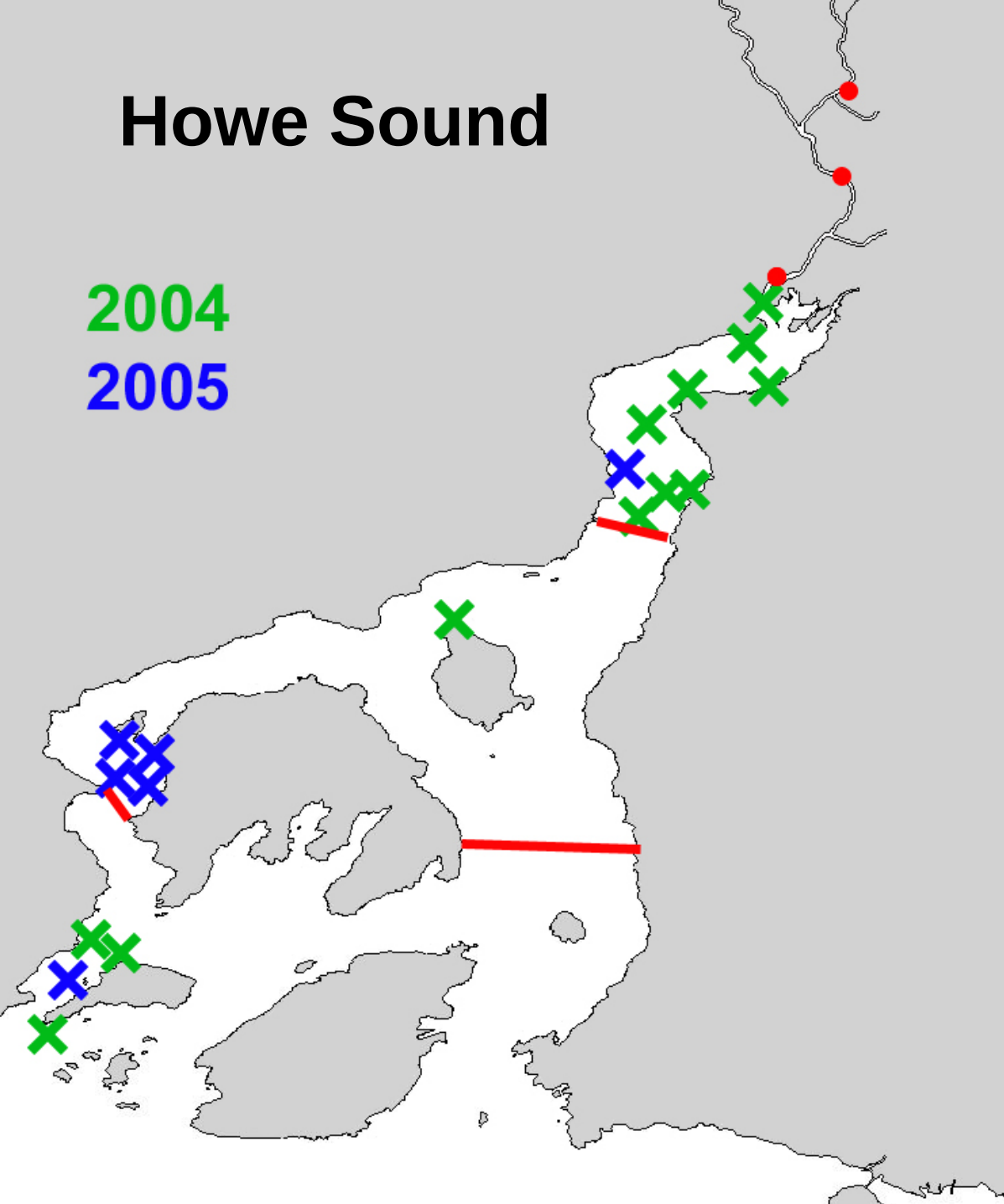
Locations where tags
stopped moving:

Steelhead smolts

Howe Sound

2004

2005

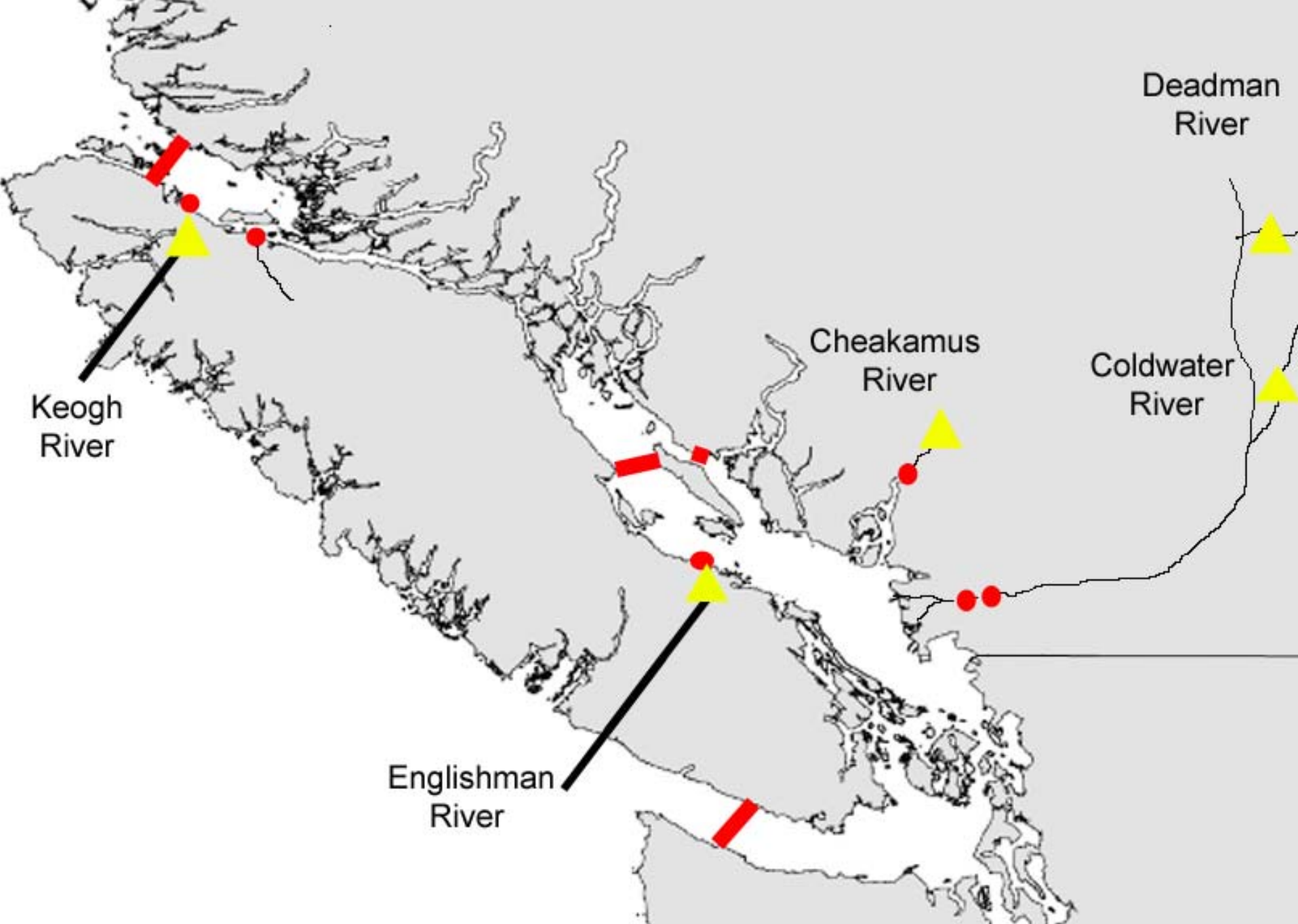


Locations where tags
stopped moving:

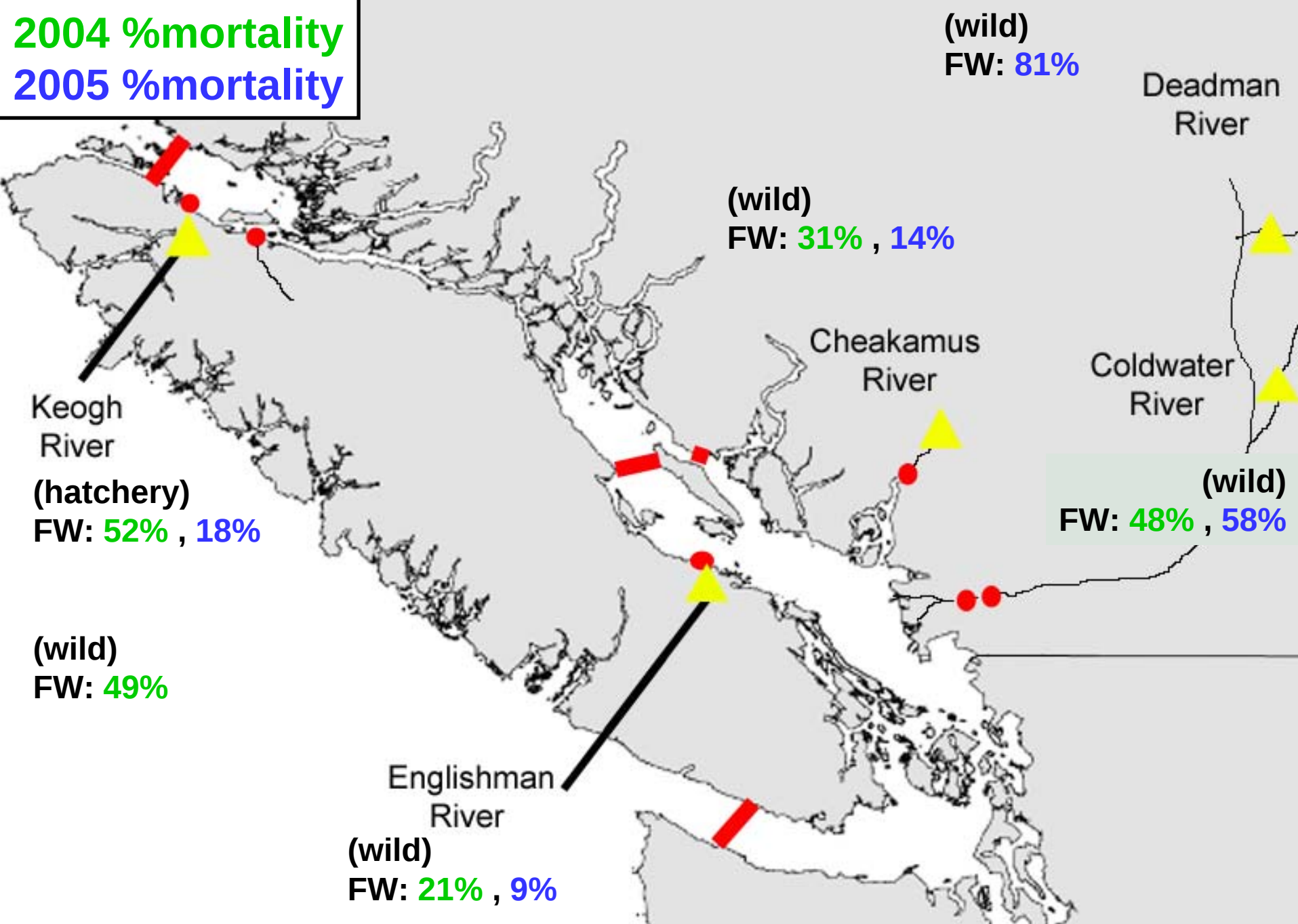
Coho smolts

Results: survival rate estimation

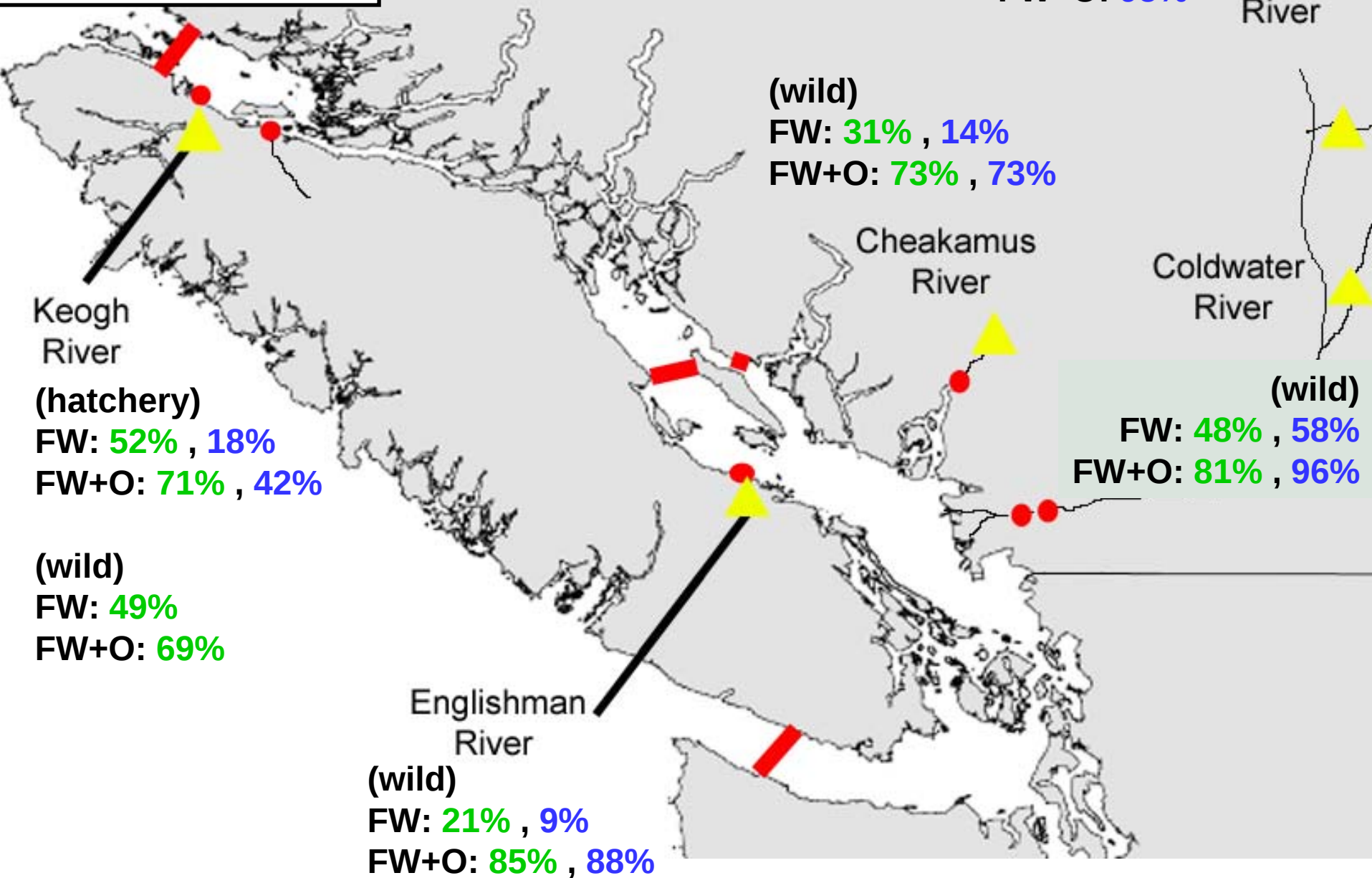
- Mortality by population
- Body size effects
 - between species
 - between steelhead populations
 - within steelhead populations
- Migration distance effects
 - between steelhead populations

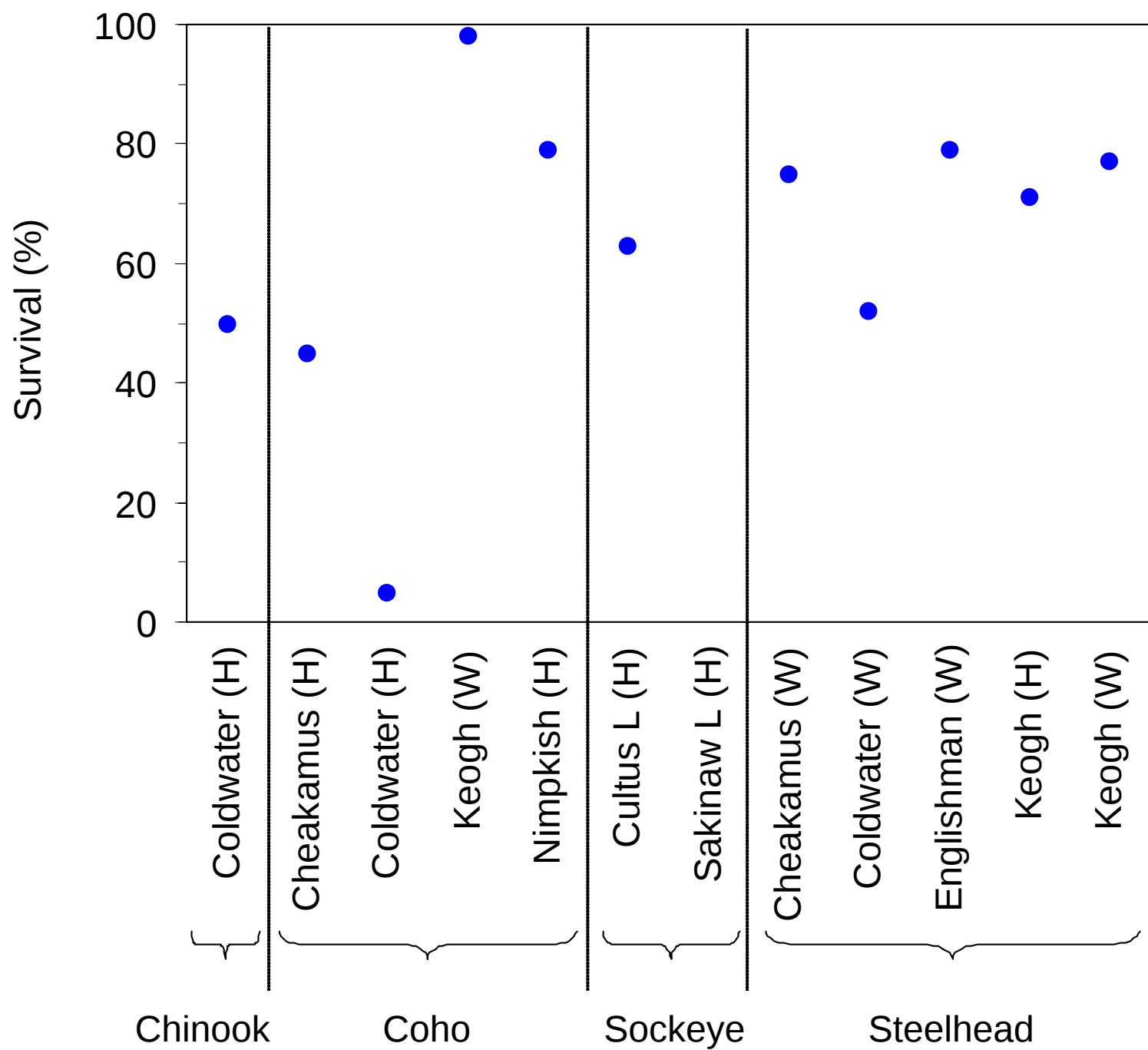


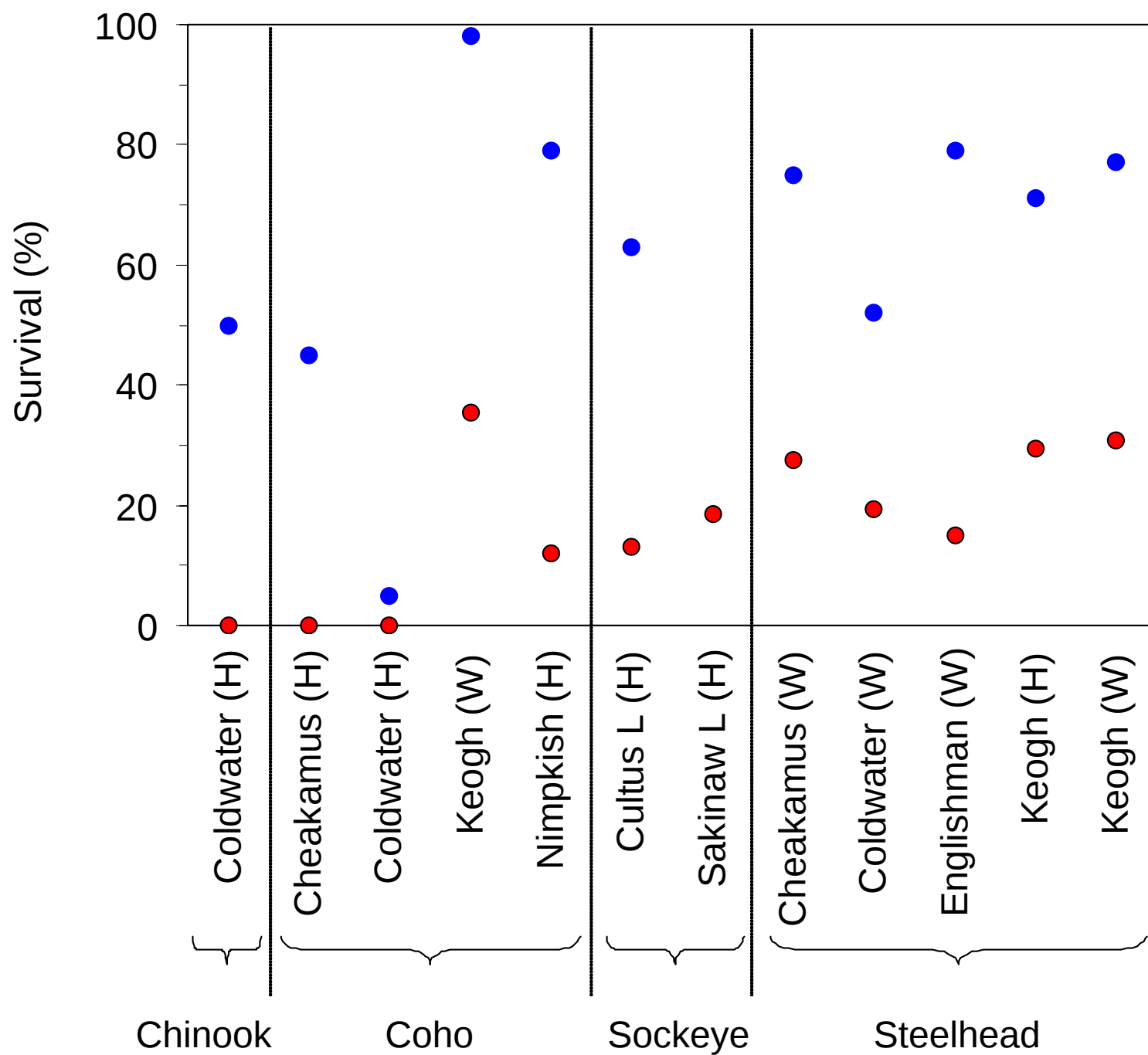
2004 %mortality
2005 %mortality

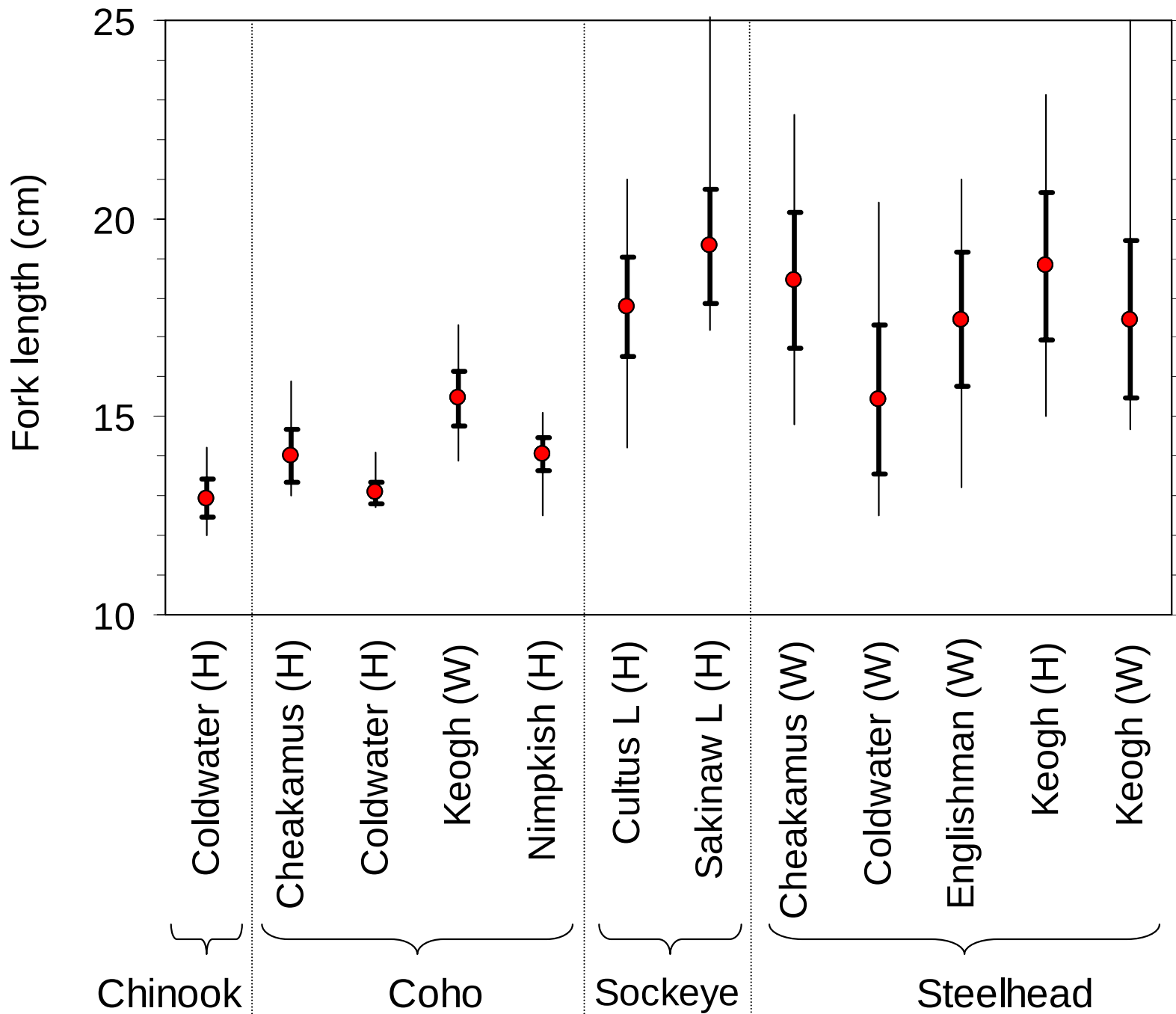


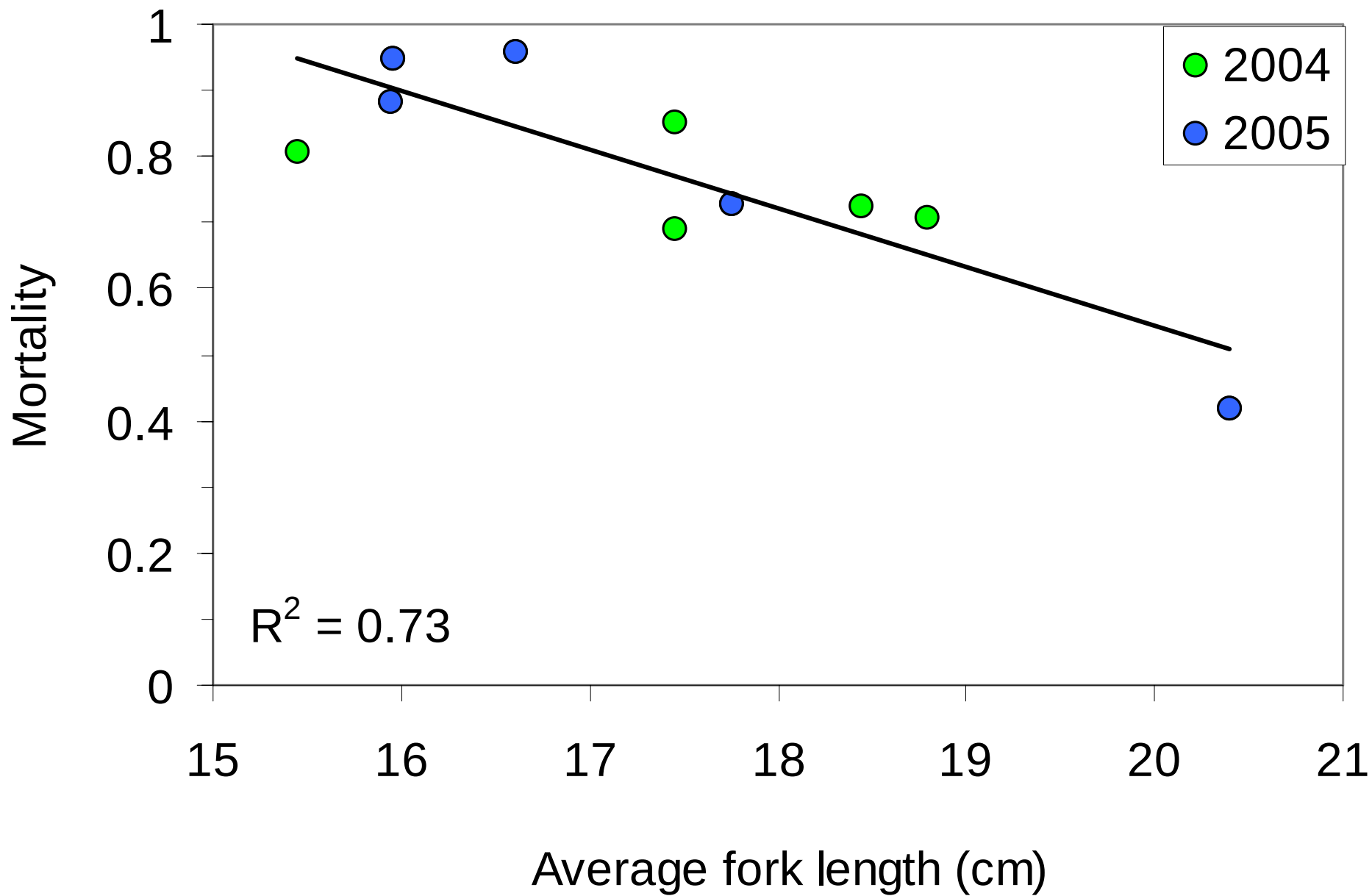
2004 %mortality
2005 %mortality

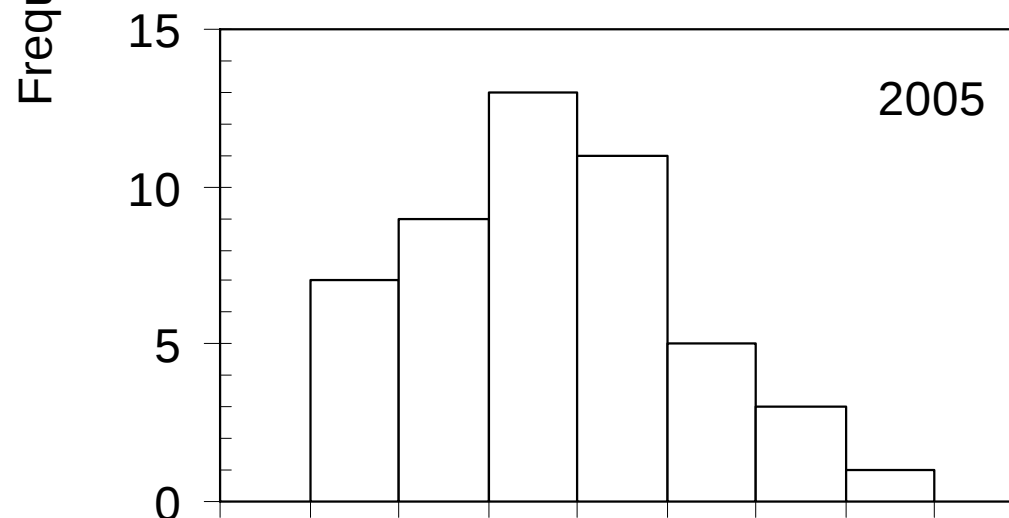
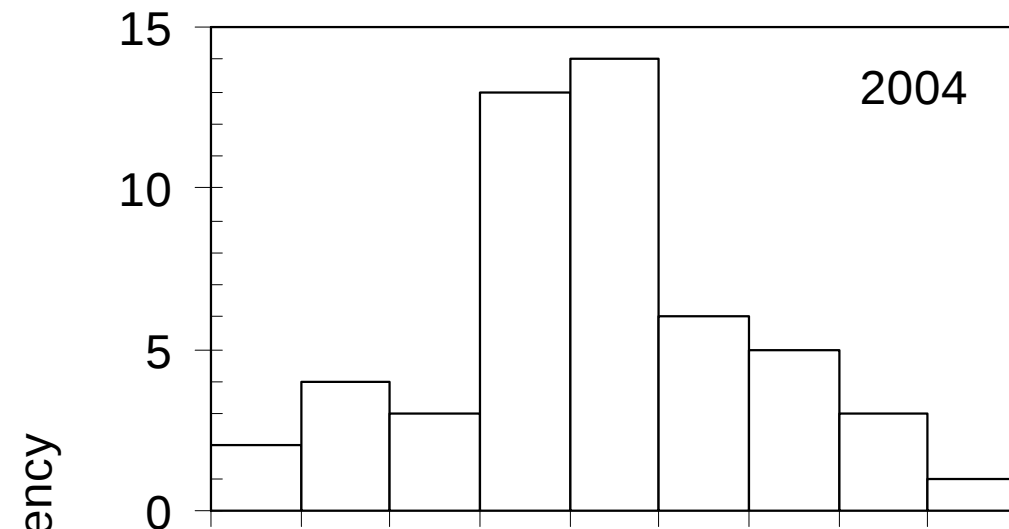






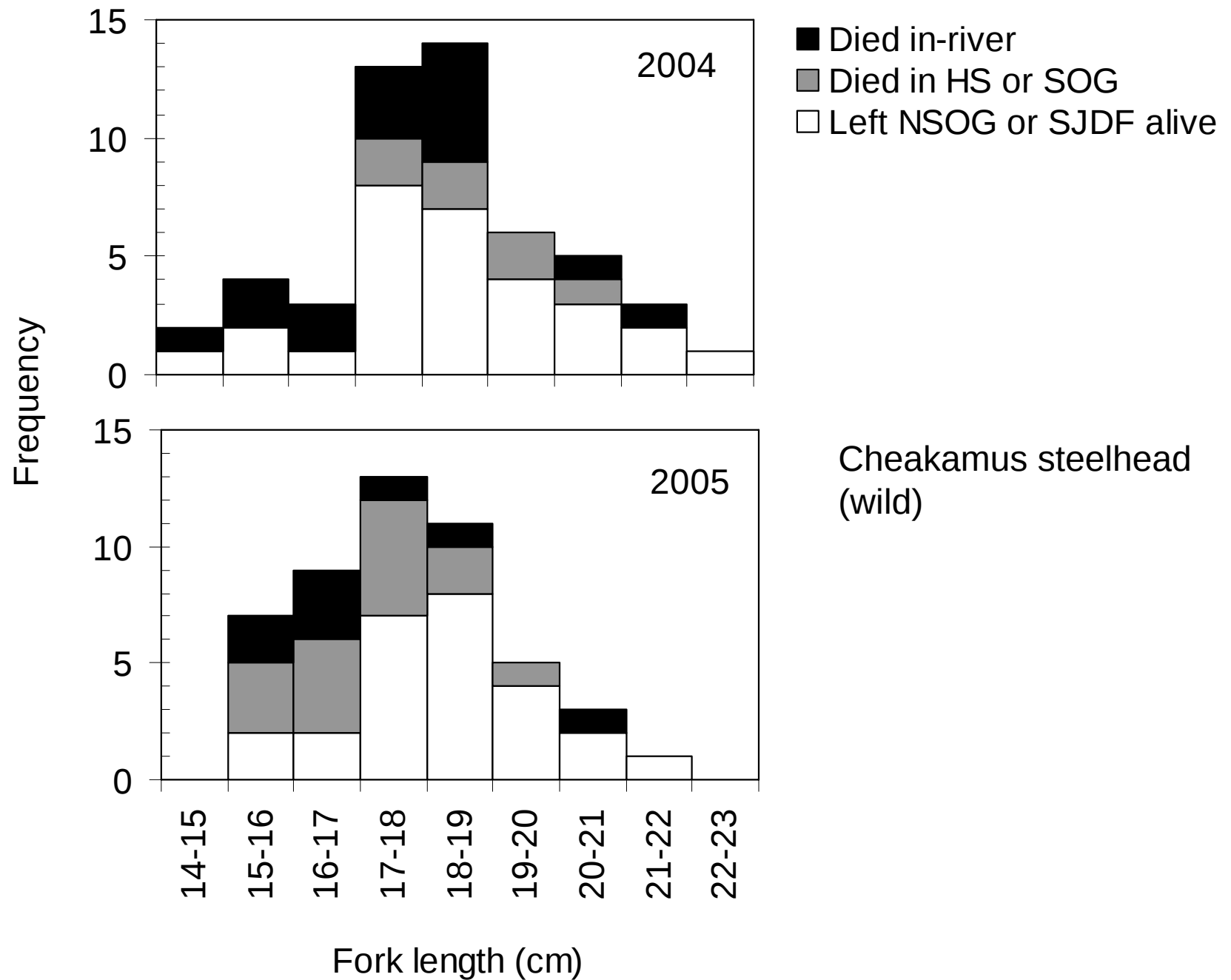




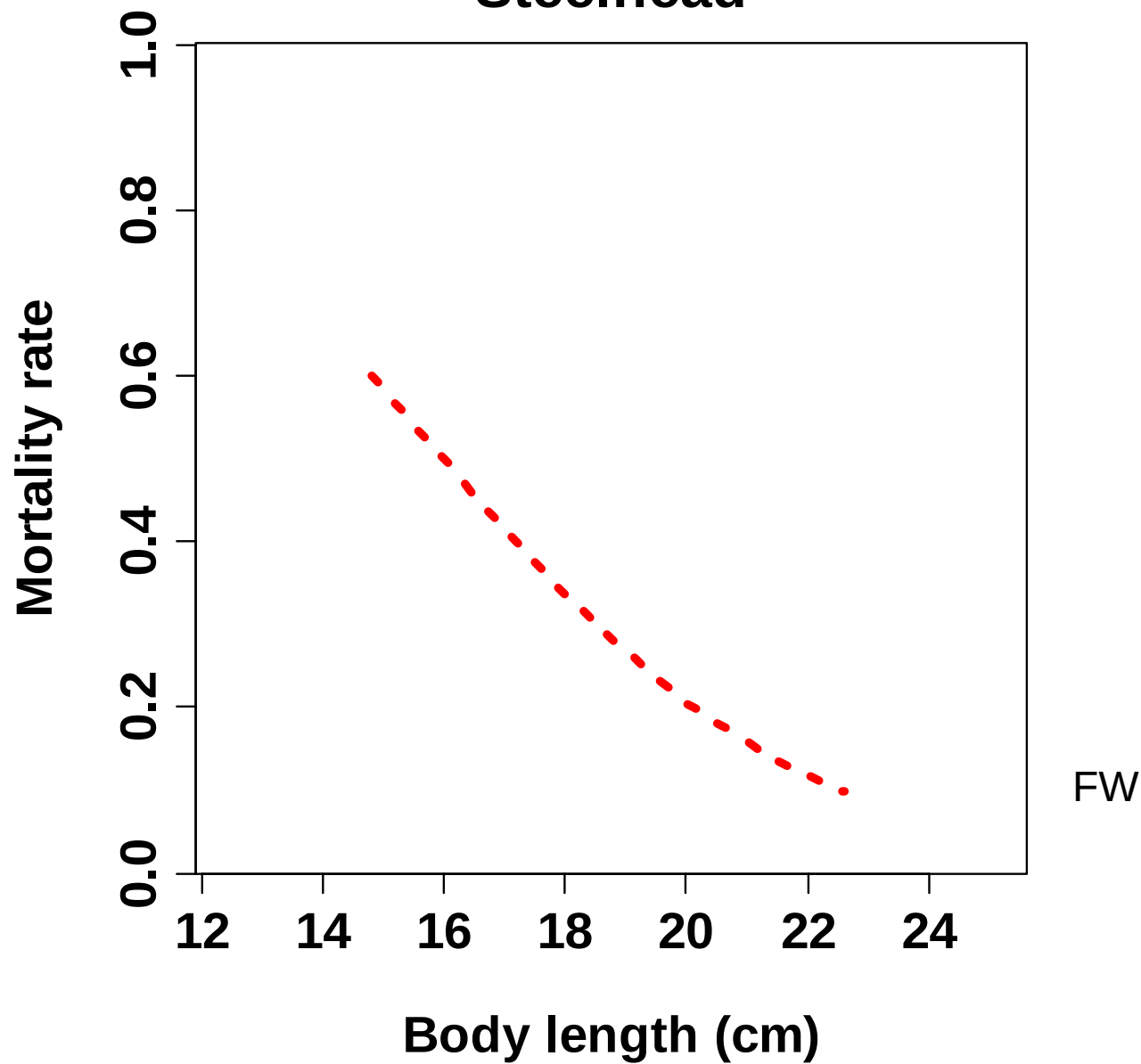


Cheakamus steelhead
(wild)

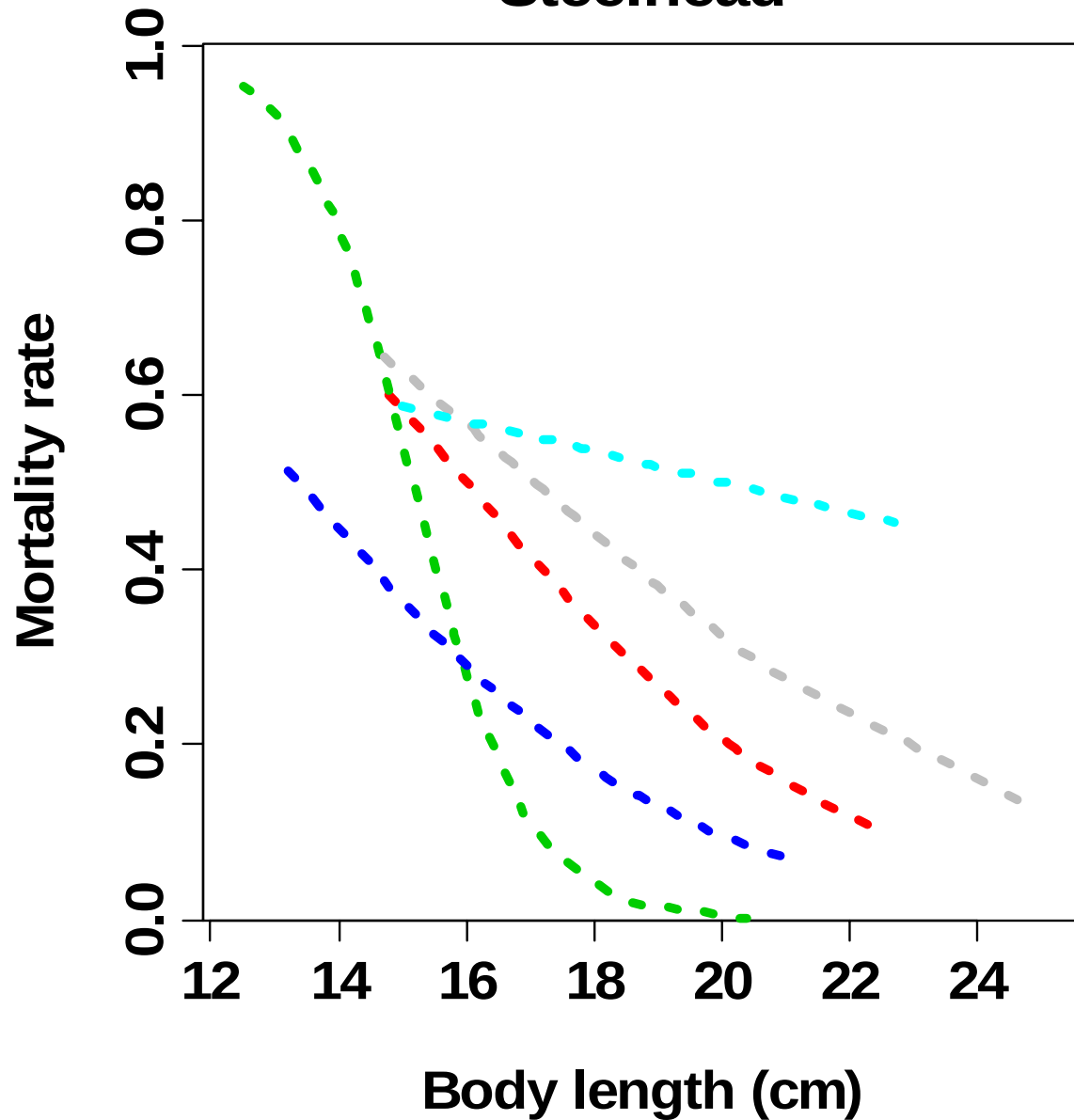
Fork length (cm)



Steelhead



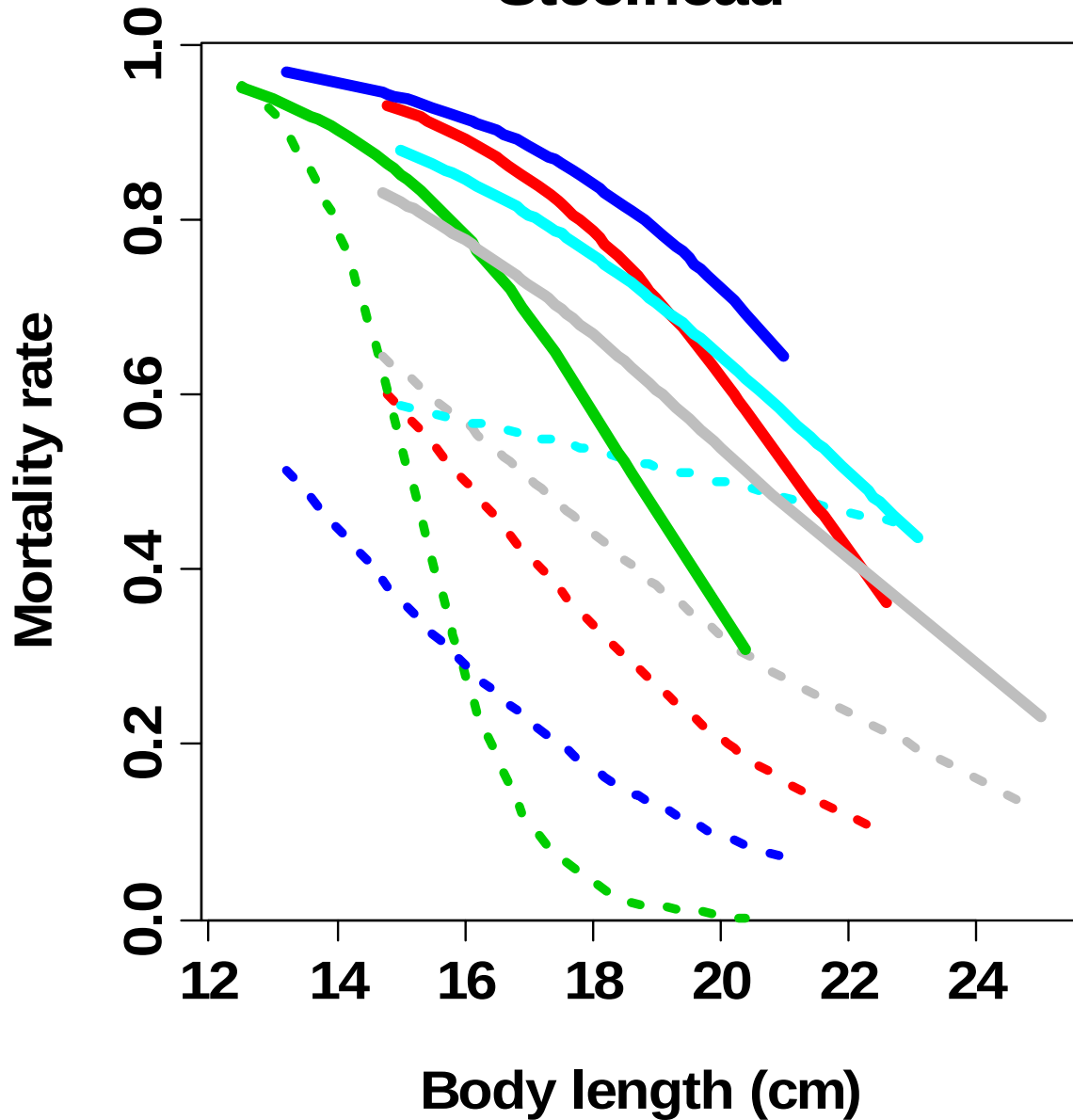
Steelhead



	n=
Cheakamus, W	51
Coldwater, W	31
Englishman, W	67
Keogh, W	78
Keogh, H	92

FW

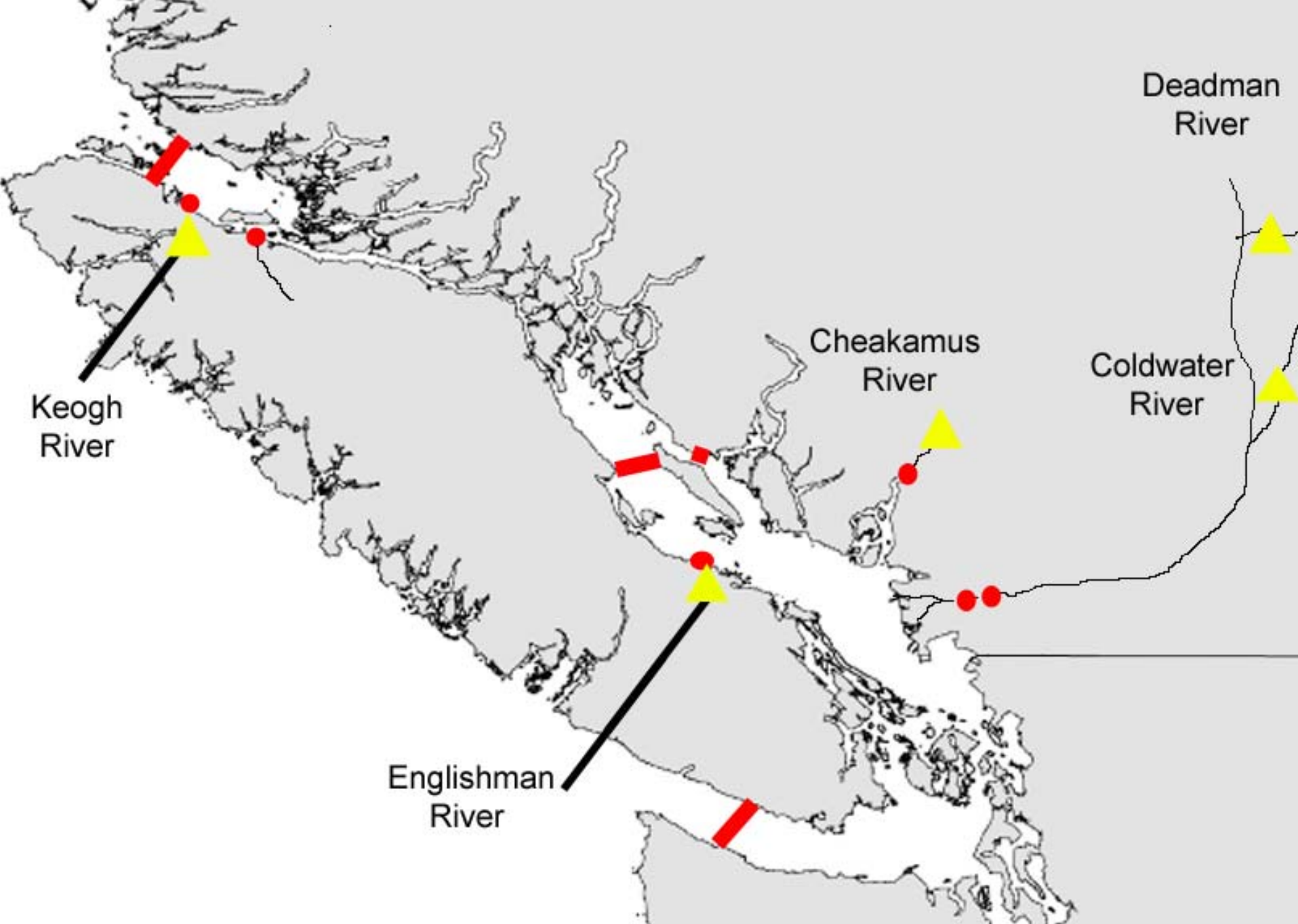
Steelhead



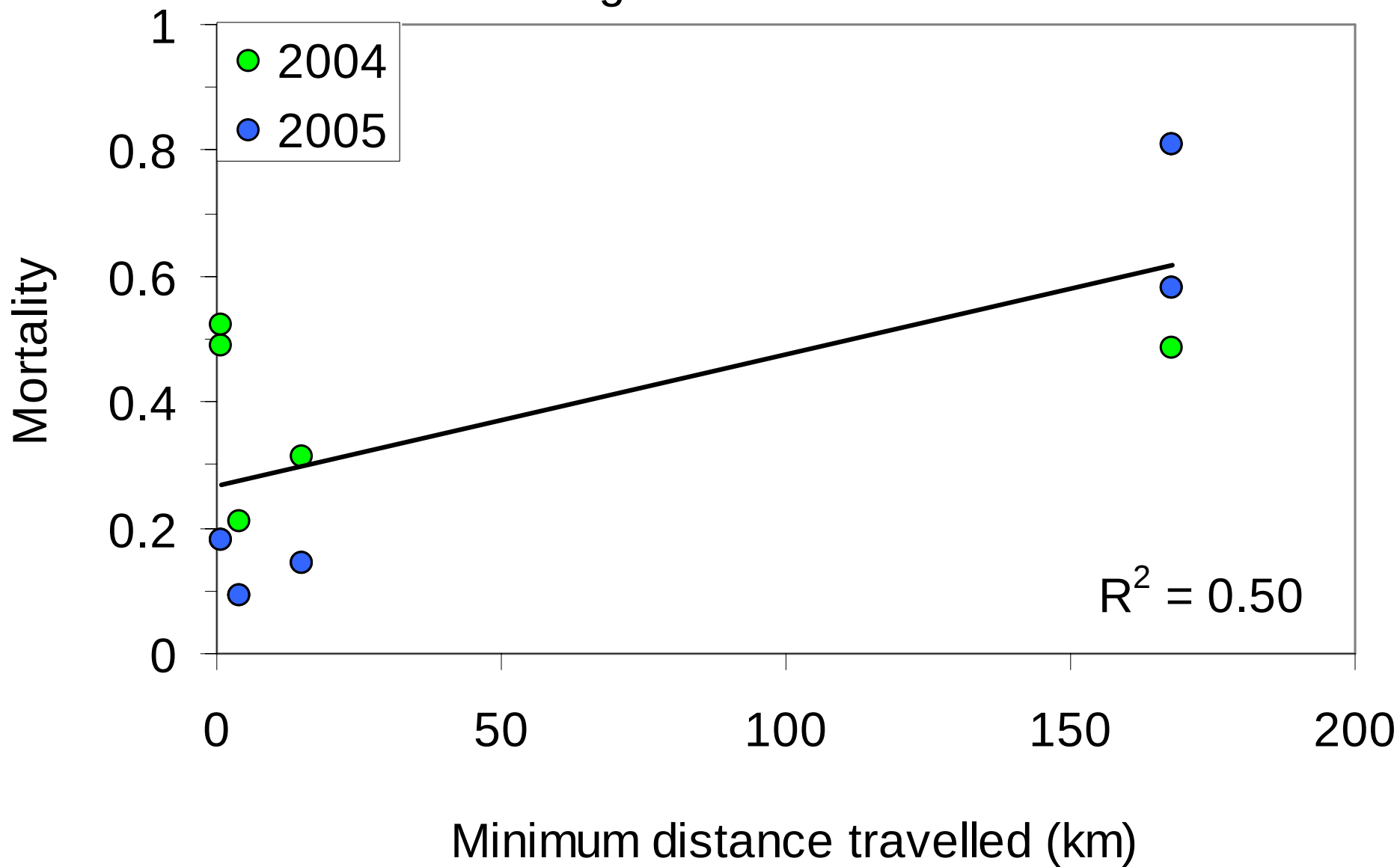
	n=
Cheakamus, W	51
Coldwater, W	31
Englishman, W	67
Keogh, W	78
Keogh, H	92

FW + inshore

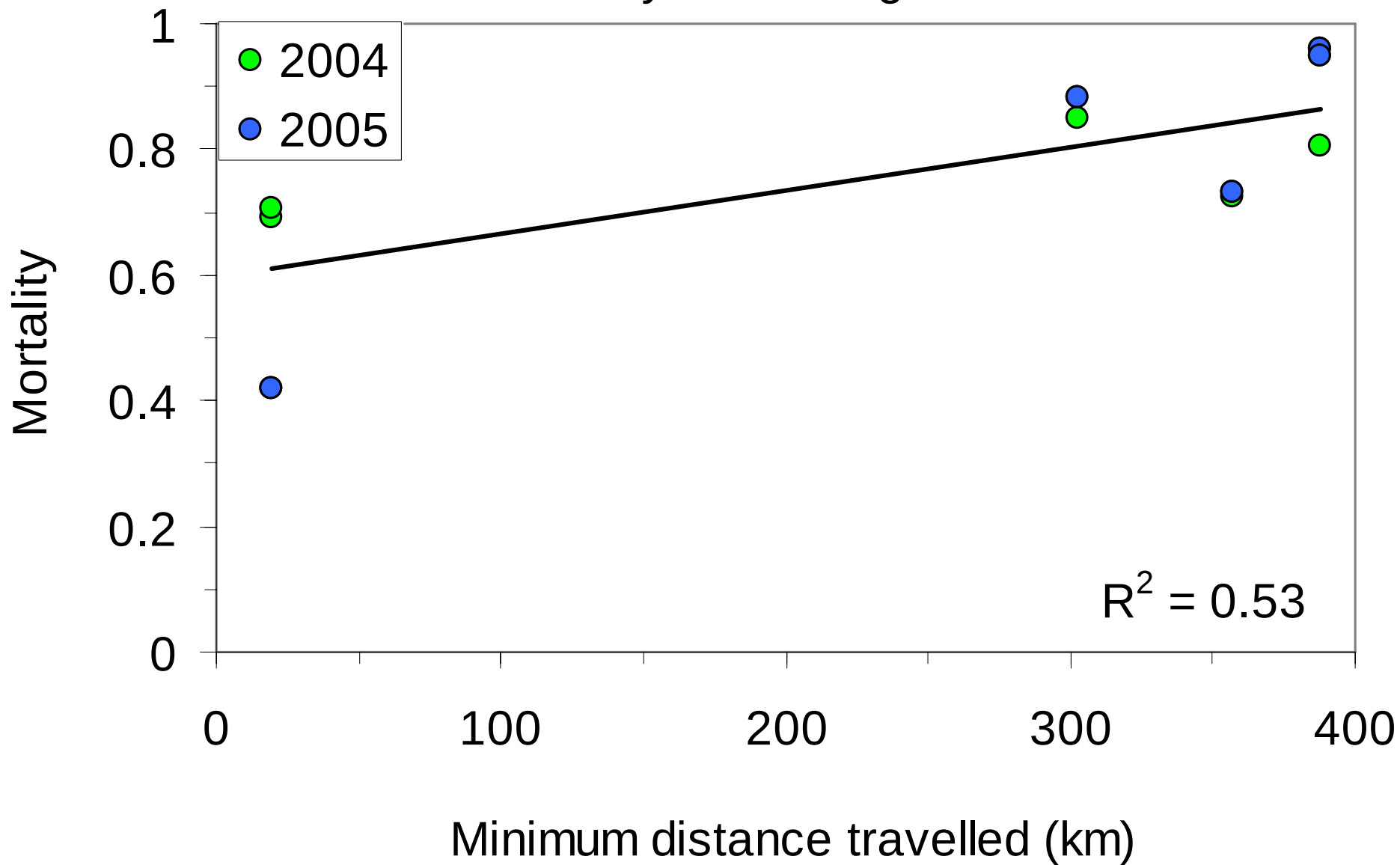
FW

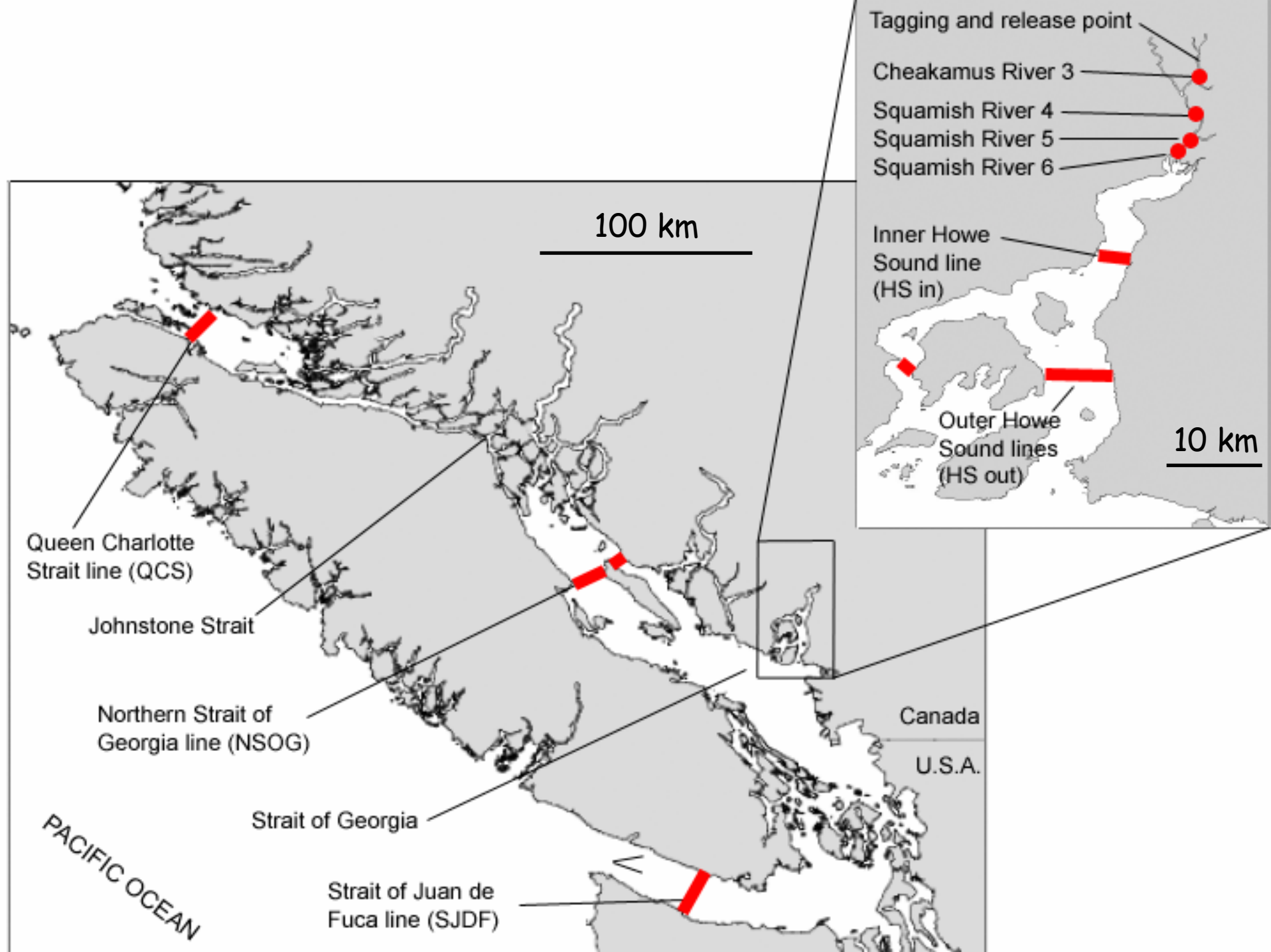


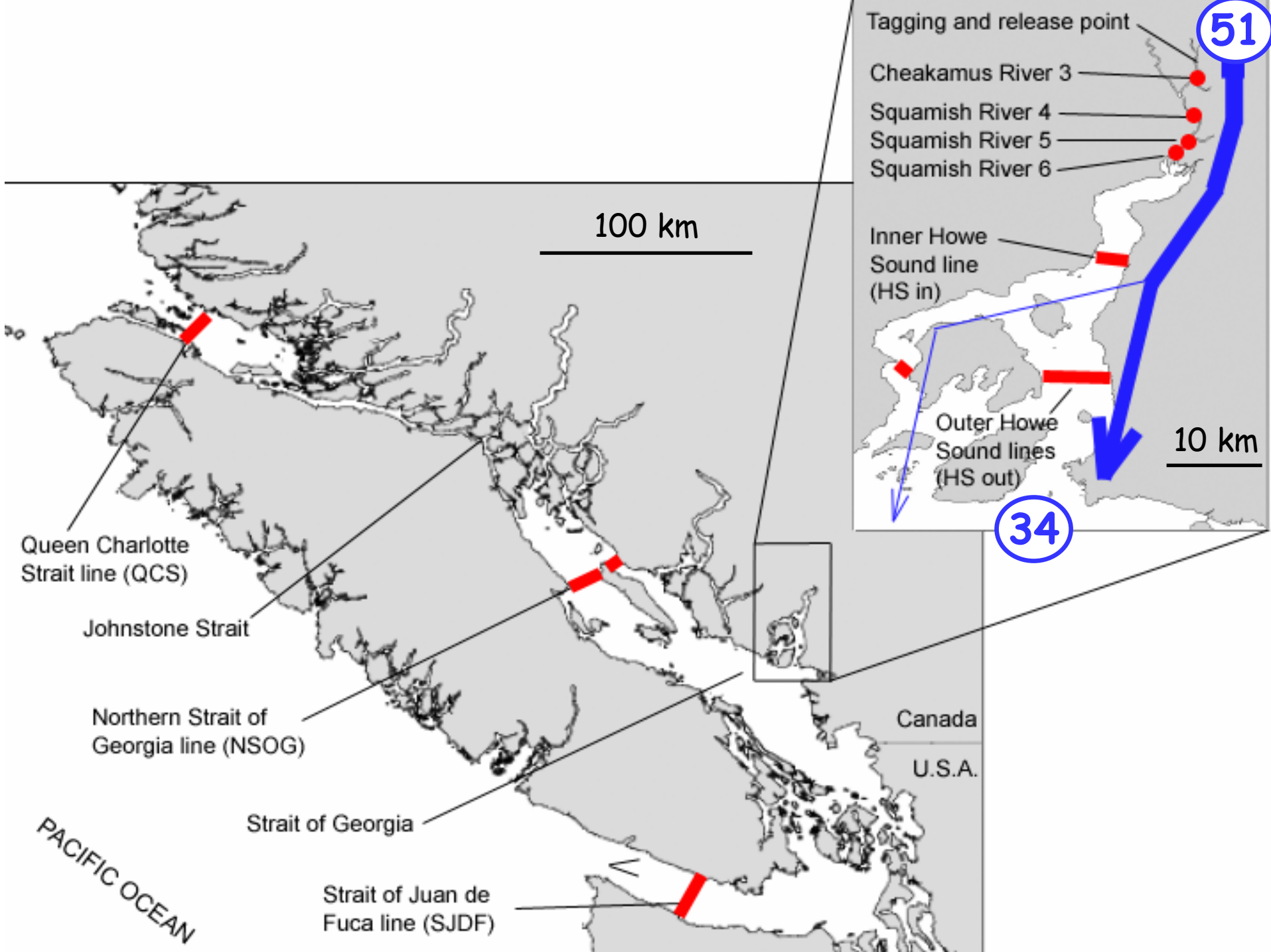
Downstream migration

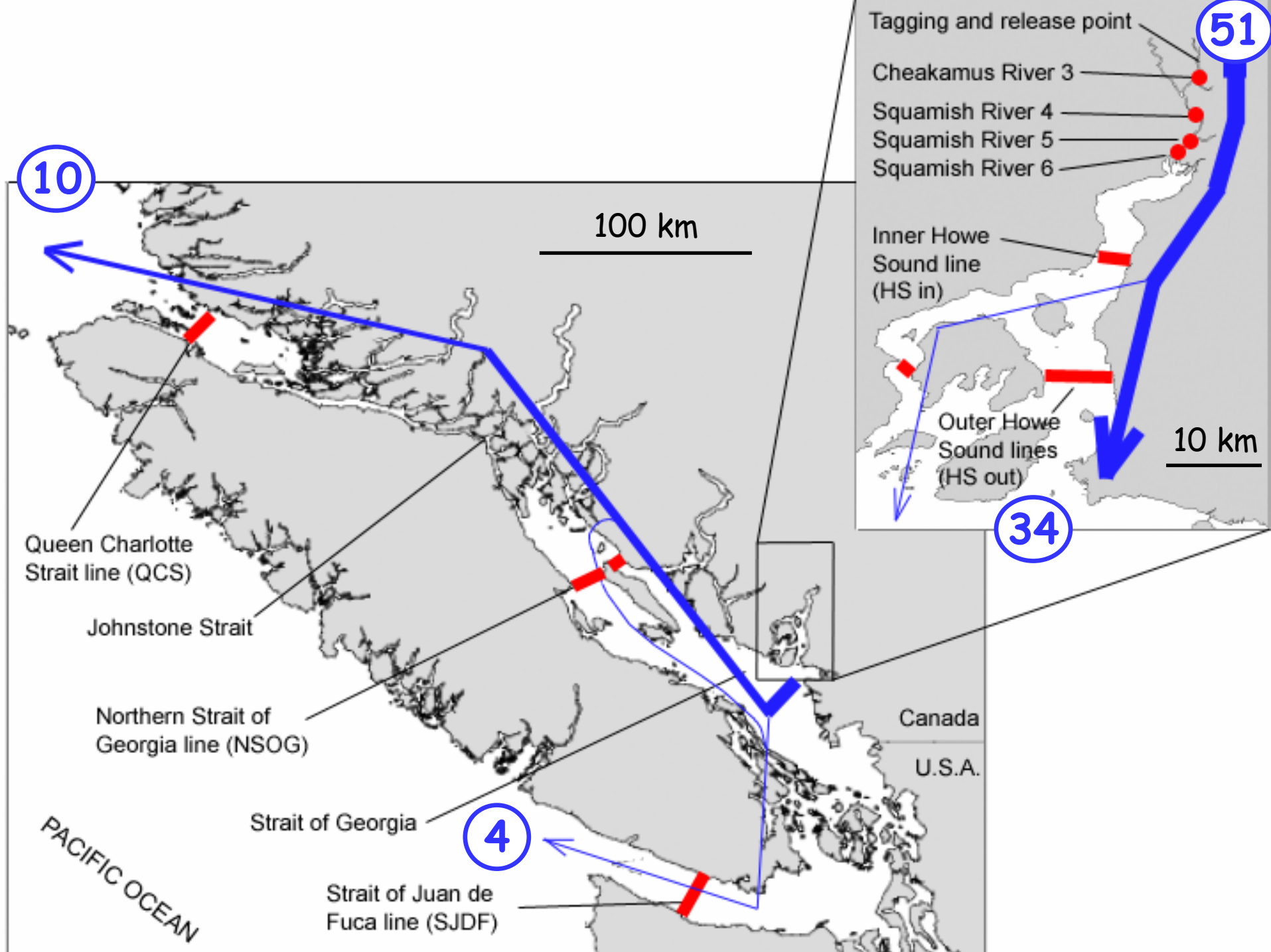


Downstream + early ocean migration



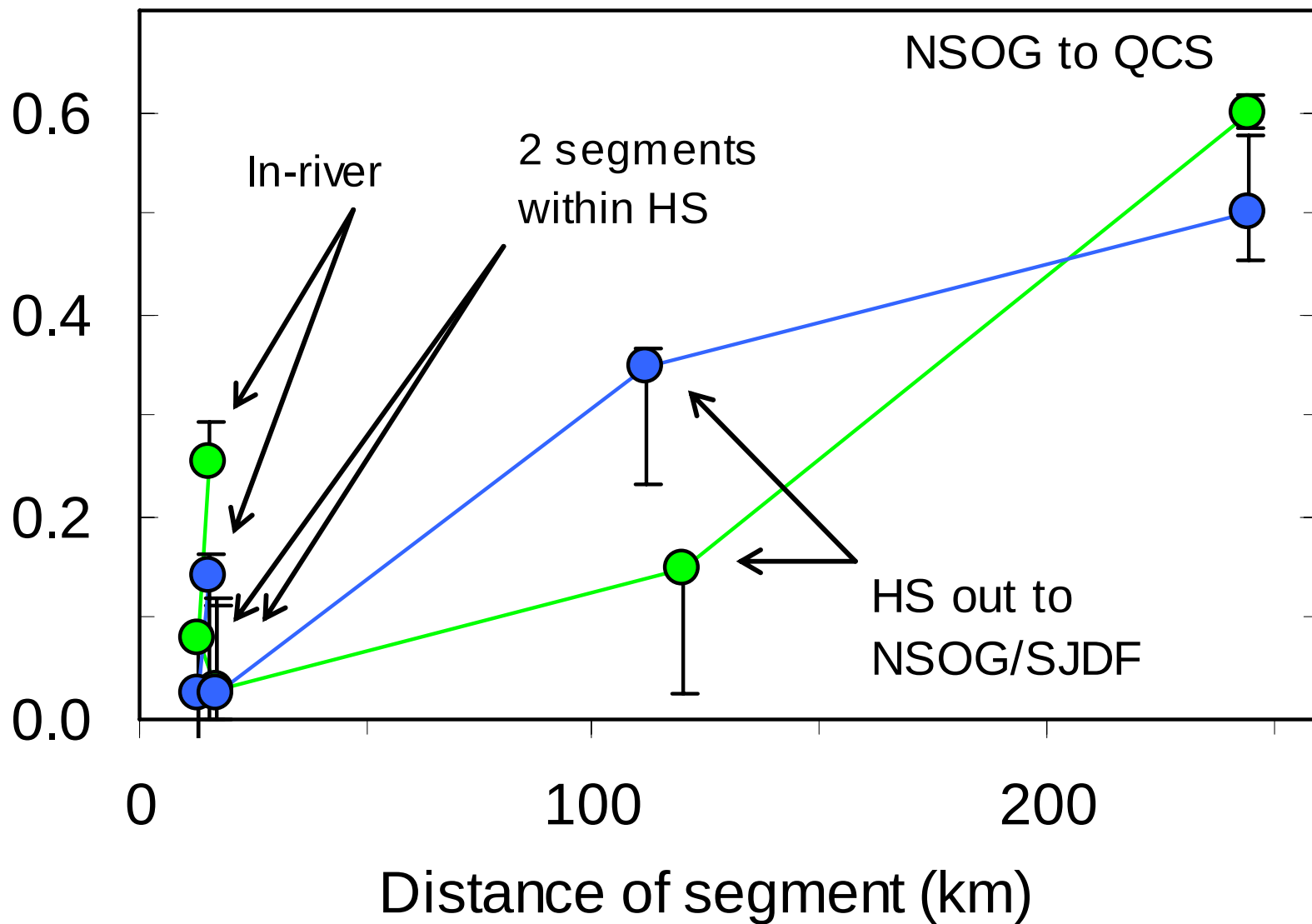


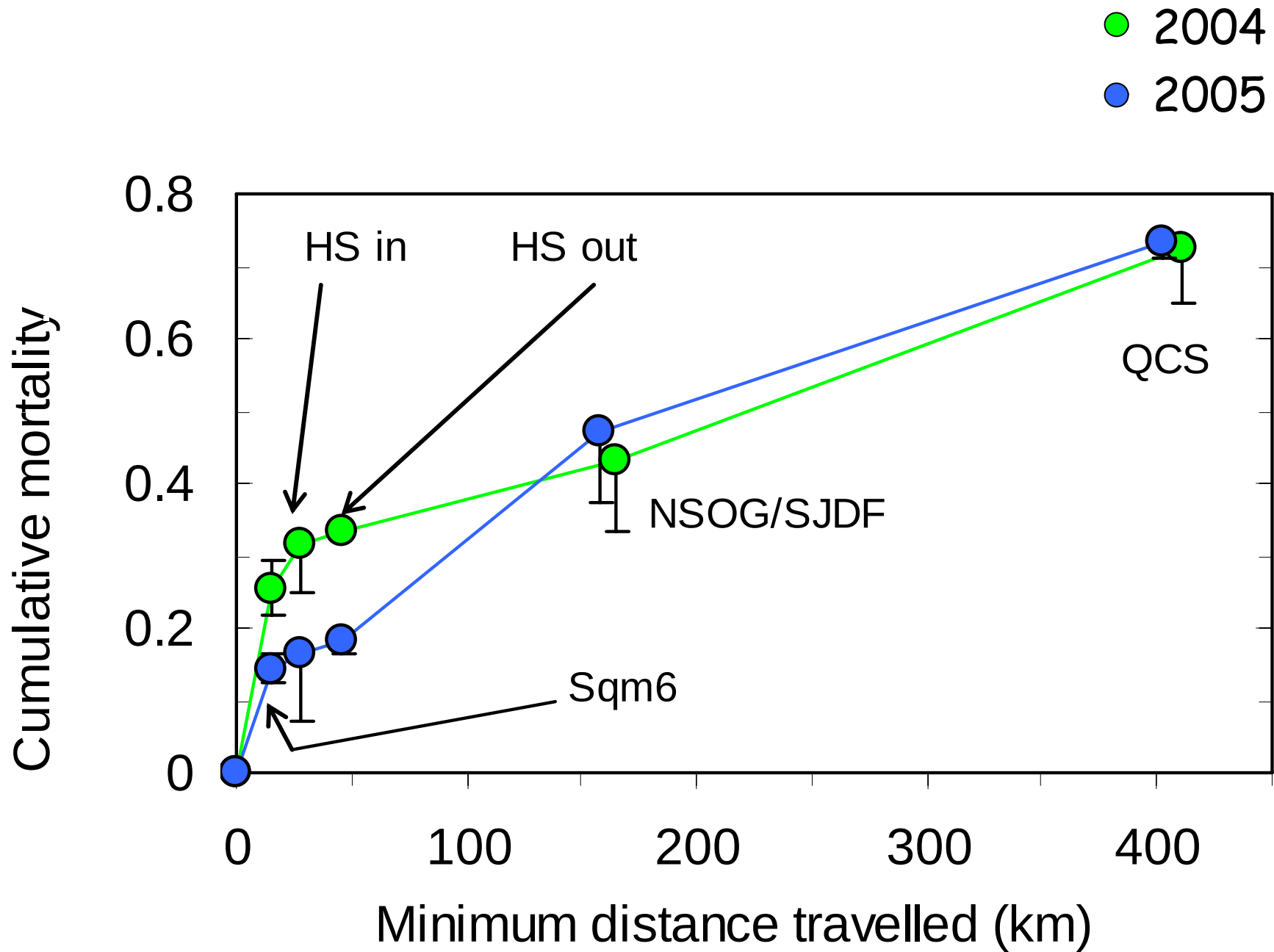




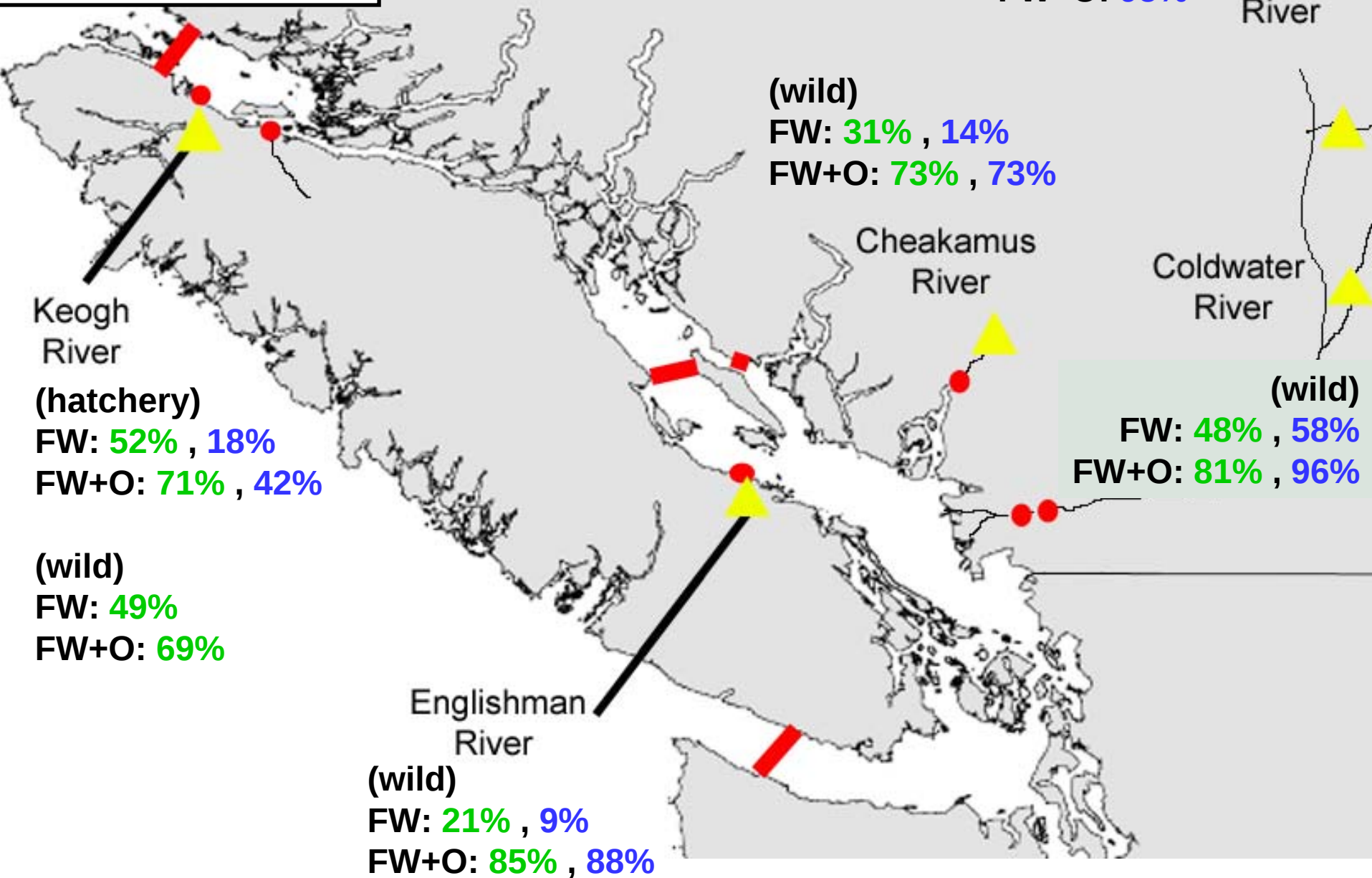
Mortality rate within segment

● 2004
● 2005

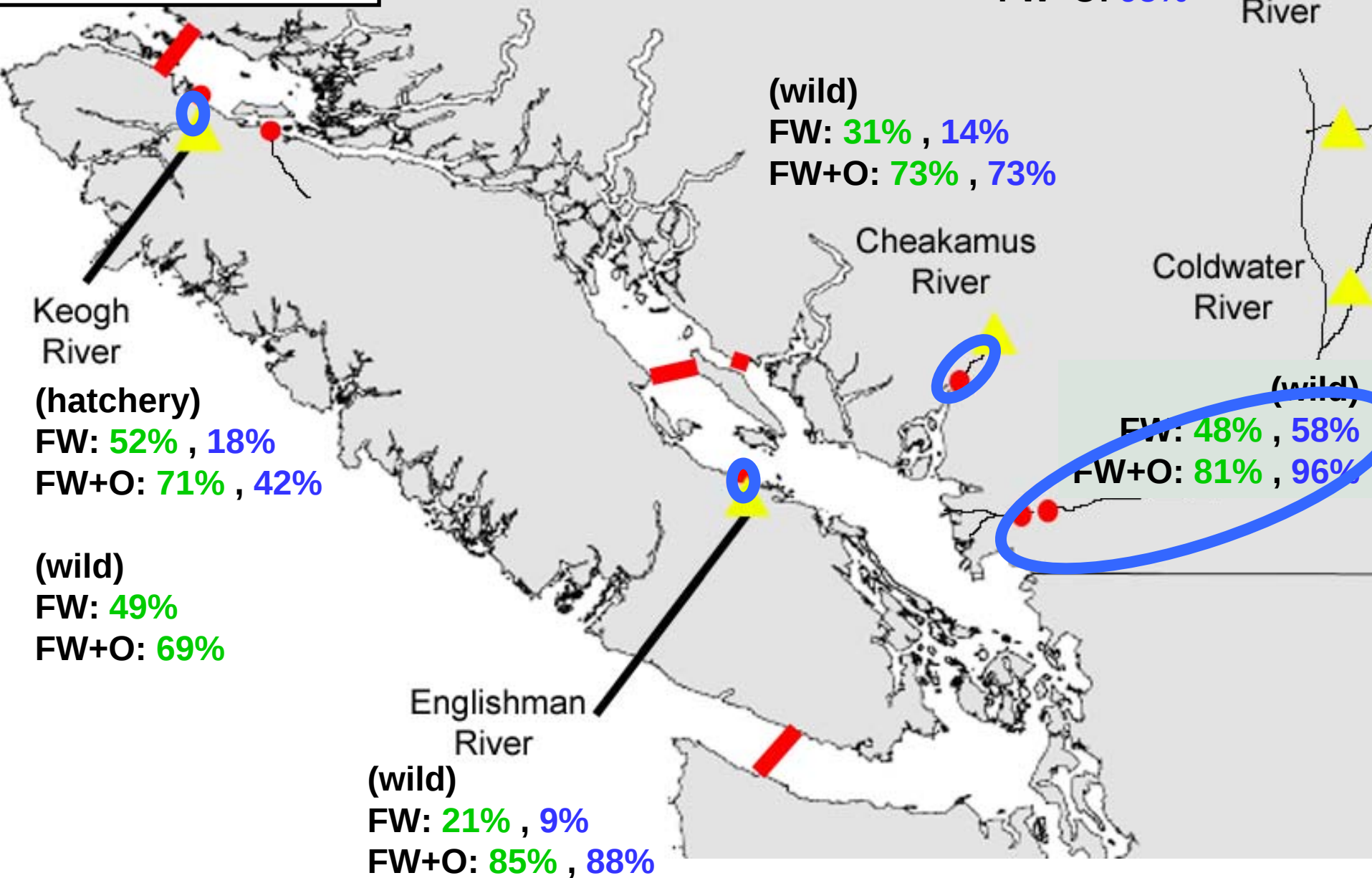




2004 %mortality
2005 %mortality

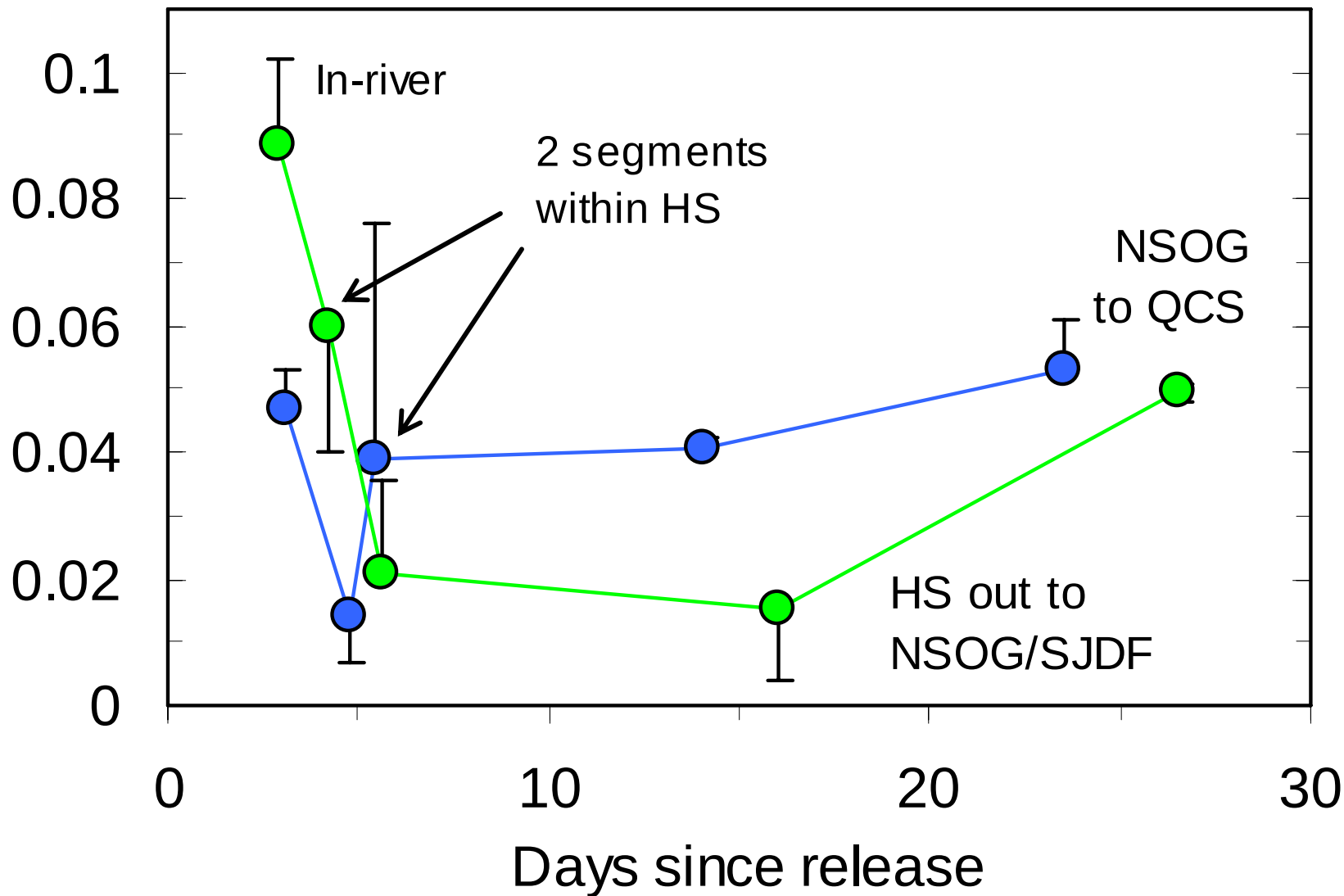


2004 %mortality
2005 %mortality



Mortality rate per day

● 2004
● 2005



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Erin Rechisky**

**Jayson Semmens
Adrian Ladouceur
Paul Winchell
Caroline Melville**

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Gilles Lacroix (DFO)**

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Thank you !

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