

Acclimation Enhances Postrelease Performance and Reduces Potential Interaction Between Hatchery and Natural Fall Chinook Salmon



Stuart Rosenberger



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Acclimation Enhances Postrelease Performance of Hatchery Fall Chinook Salmon Subyearlings while Reducing the Potential for Interaction with Natural Fish

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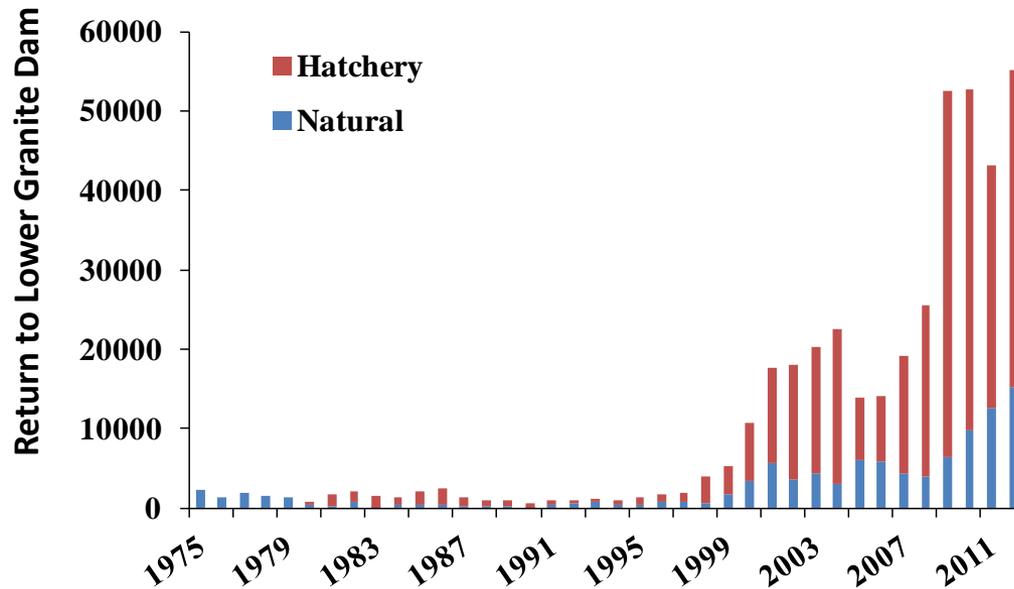
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Snake River Fall Chinook

- Listed as Threatened under ESA 1992



Nez Perce Tribe Fall Chinook Acclimation Program (FCAP)

- Releases Began in 1997
- Pittsburg Landing (Snake R.)
- Captain John Rapids (Snake R.)
- Big Canyon (Clearwater R.)



Courtesy of NPT

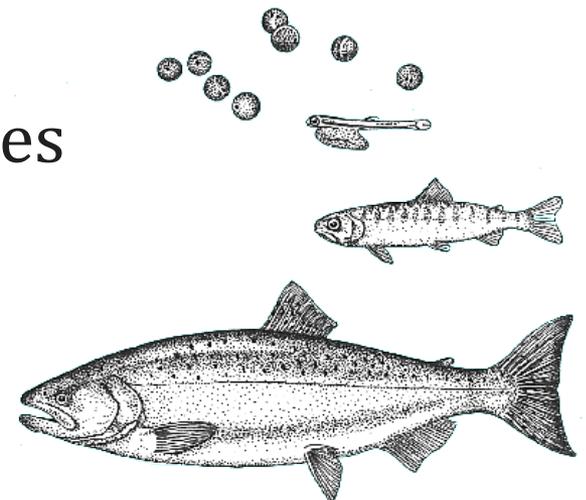
Acclimation

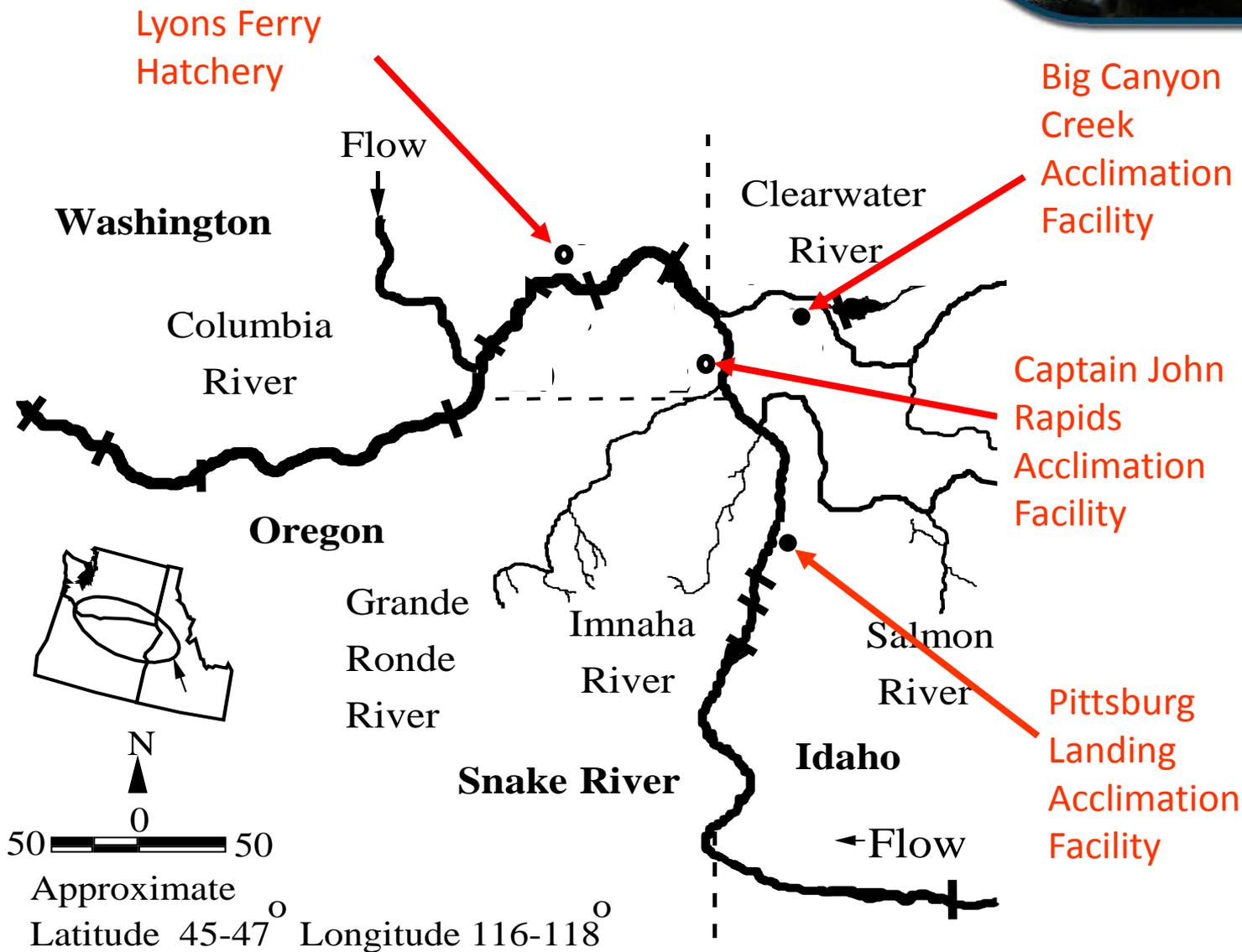
Benefits may include.....

- Reduction of transportation stress
- Introduction of natural prey items
- Introduction to natural thermal patterns

Potential Outcomes

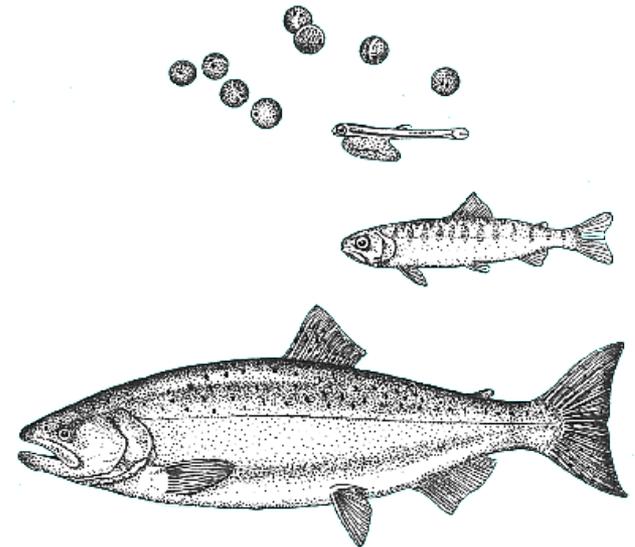
- Increase Juvenile Survival
- Increase Adult Homing to Release Sites
- Increase SAR's





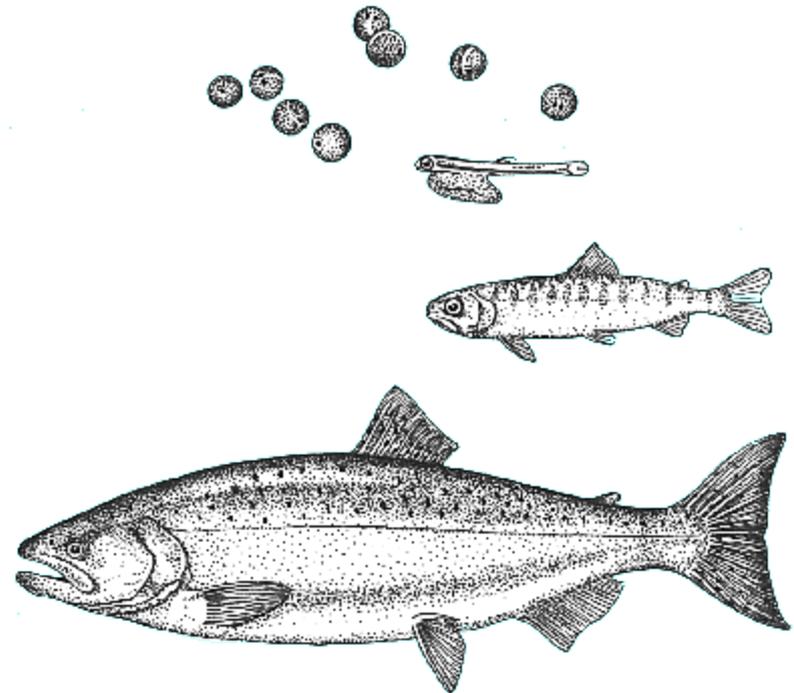
Double Shifting

- Capacity at Acclimation Facilities
- Lower Flows
- Higher Temperatures
- May reduce survival



Study Design

- 5 yr Study
- Acclimated (3 weeks) vs. Direct Release
- Phase 1; Juvenile Performance
- Phase 2; Adult Returns



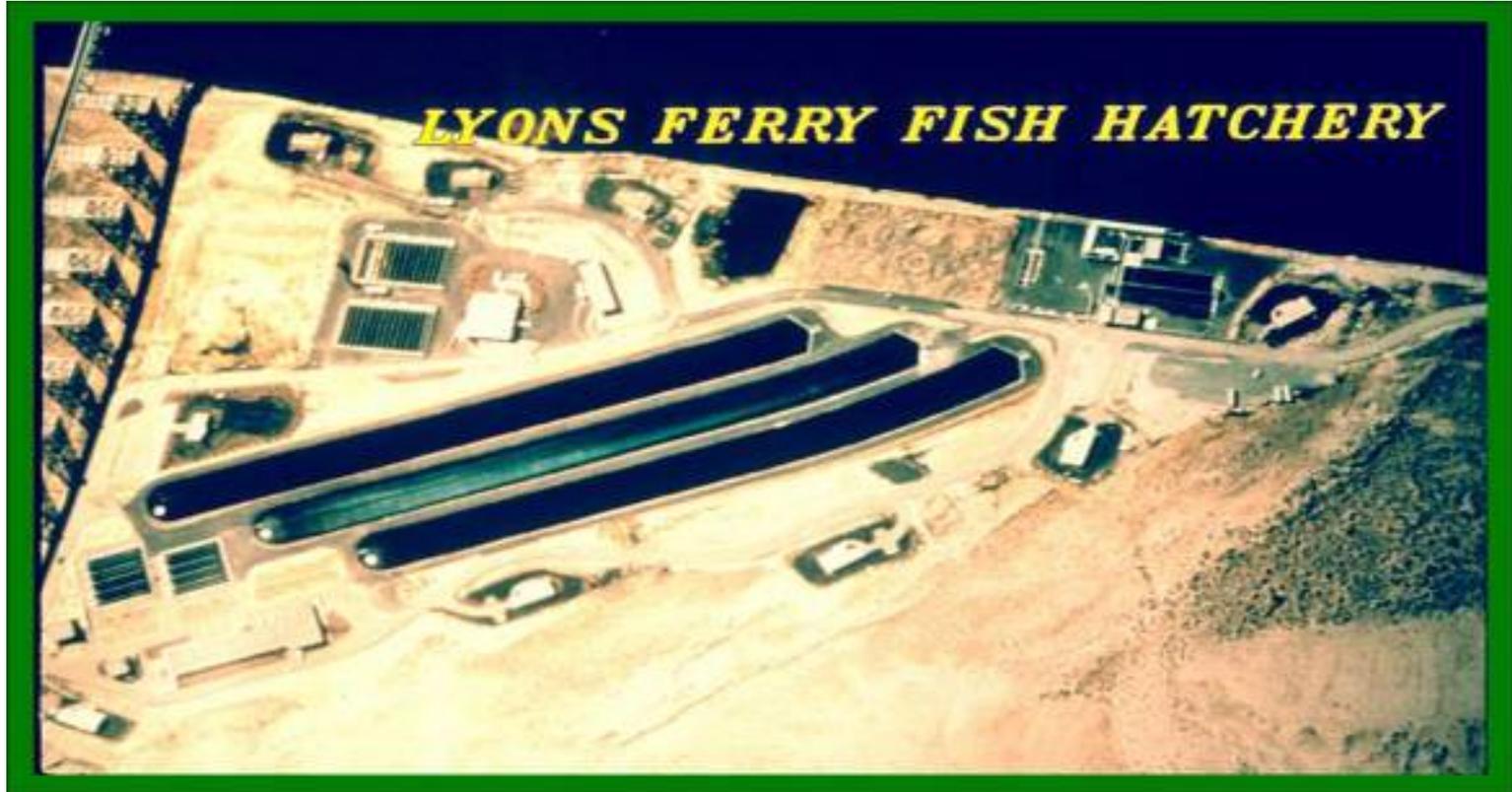
Captain John Rapids



Courtesy of NPT

Lyons Ferry Hatchery

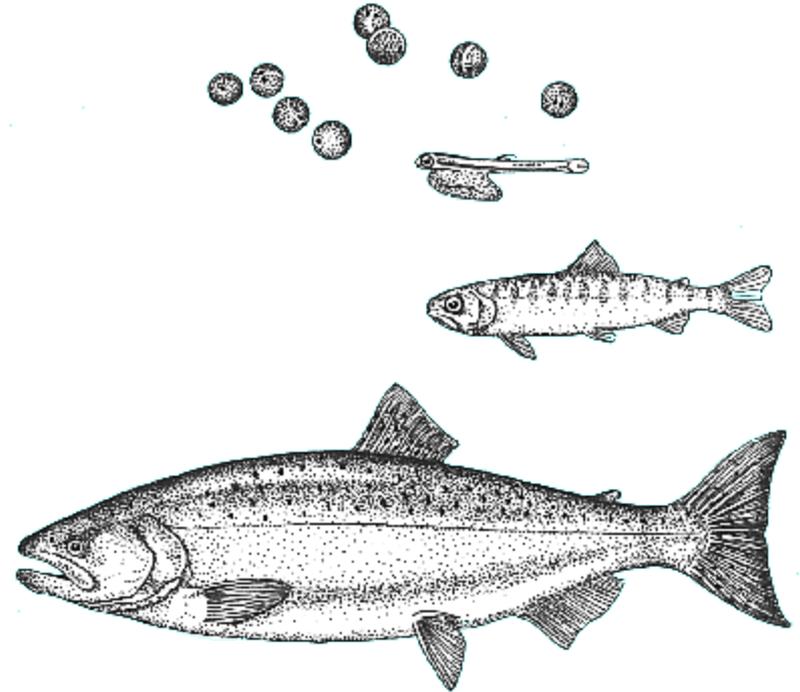
(1984)



Fish Culture

Consistency

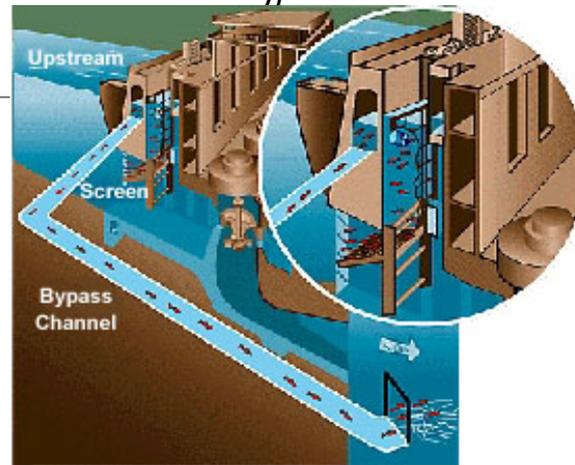
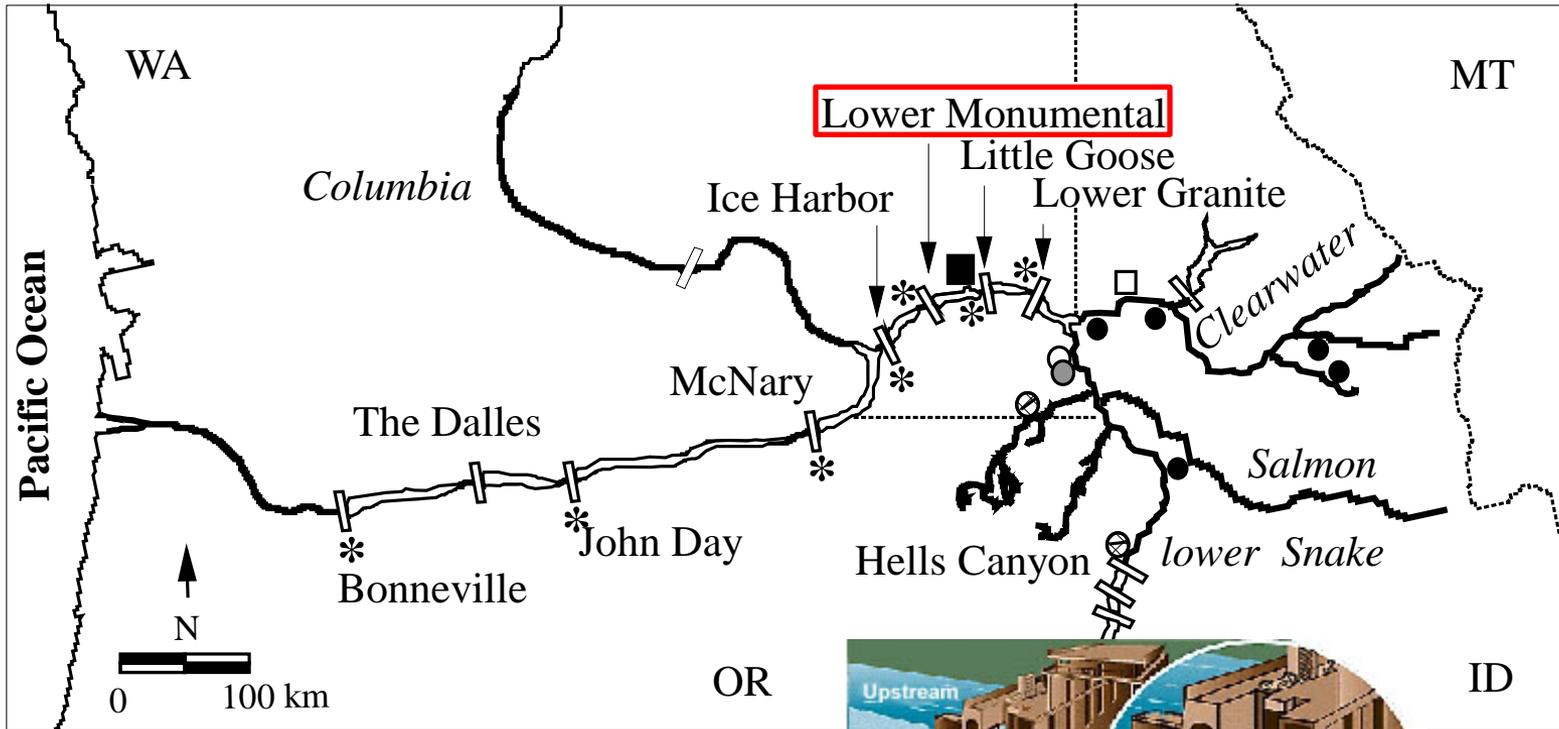
- Rearing Containers
- Feed
- Flow and Density Indices
- Disease Monitoring (Elisa)
- Tagging Practices
- Size at Release
- ????????



Juvenile Releases

Year	Group	N	PIT's	Release dates		Fork length
				min	max	
2008	Acclimated	512,745	14,757	05/28	05/28	69 ± 6
	Direct	230,401	15,807	05/28	05/28	72 ± 6
	Natural		6,755	04/22	07/16	64 ± 11
2009	Acclimated	524,910	13,726	05/26	05/26	80 ± 6
	Direct	200,744	13,665	05/26	05/26	76 ± 6
	Natural		6,880	04/08	07/07	61 ± 9
2010	Acclimated	528,777	14,866	05/24	05/24	75 ± 5
	Direct	203,162	15,347	05/24	05/24	71 ± 4
	Natural		8,168	03/30	07/22	61 ± 10

Juvenile Performance





Juvenile Performance

Release to Lower Monumental Dam

Year	Group	Detections	Passage Rate (Km/day)	Detection Date
2008	Acclimated	1,388	13.3 ± 5.5	$06/14 \pm 8$
	Direct	682	8.0 ± 3.7	$06/25 \pm 14$



Juvenile Performance

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2009	Acclimated	1,533	20.6 ± 6.9	$06/06 \pm 4$
	Direct	973	11.7 ± 4.7	$06/13 \pm 7$



Juvenile Performance

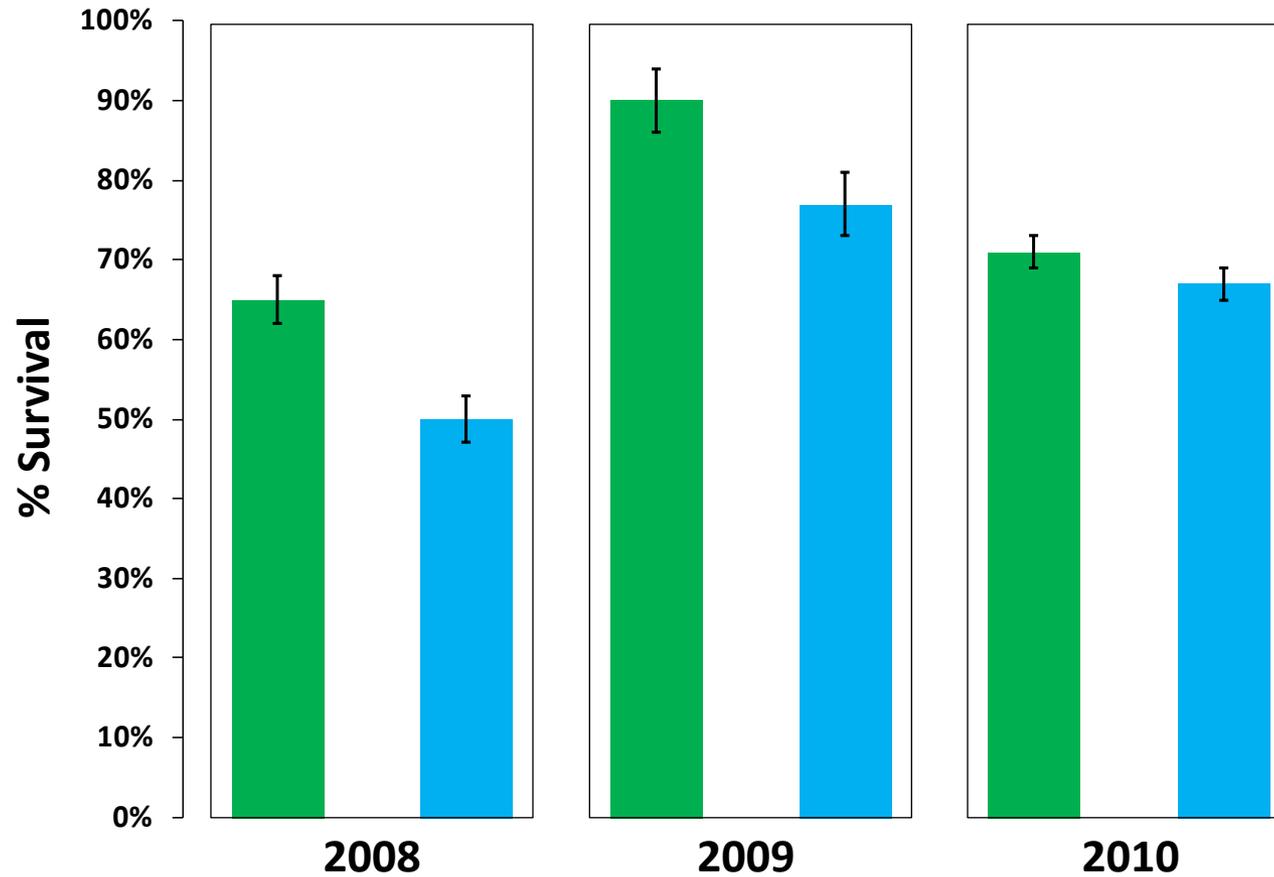
Release to Lower Monumental Dam

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2009	Acclimated	1,533	20.6 ± 6.9	06/06 \pm 4
	Direct	973	11.7 ± 4.7	06/13 \pm 7
2010	Acclimated	2,236	12.2 ± 2.3	06/10 \pm 4
	Direct	2,513	9.8 ± 1.9	06/13 \pm 5

Survival

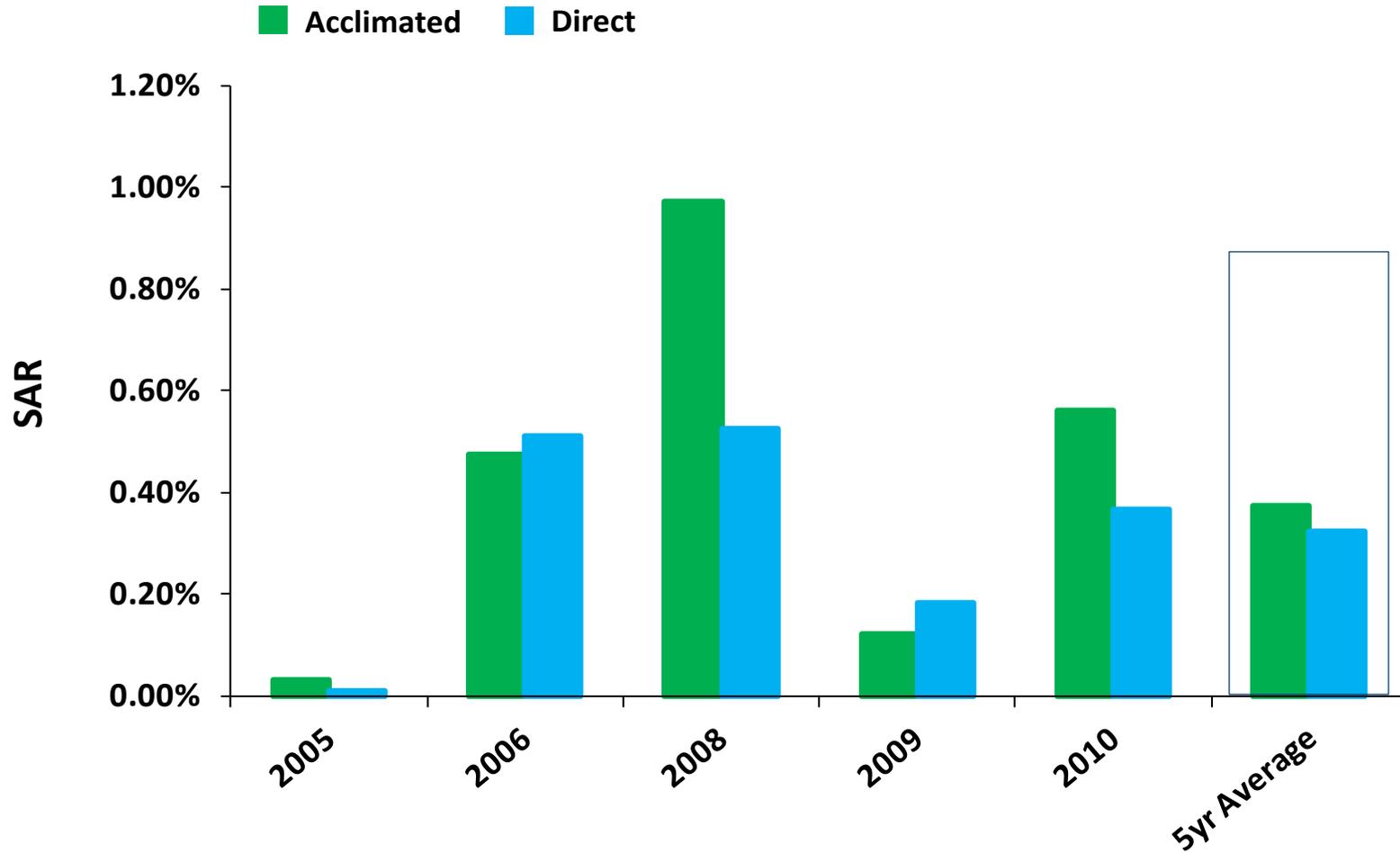
Release to LMN

■ Acclimated ■ Direct



Adult SAR's

Release to Lower Granite Dam

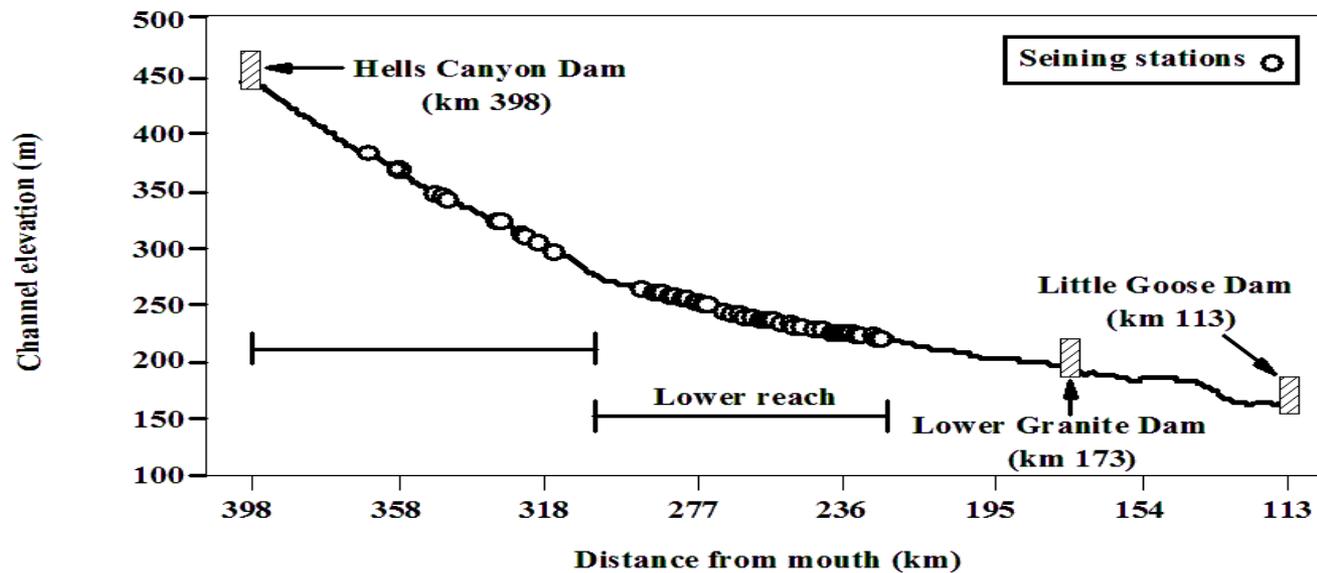
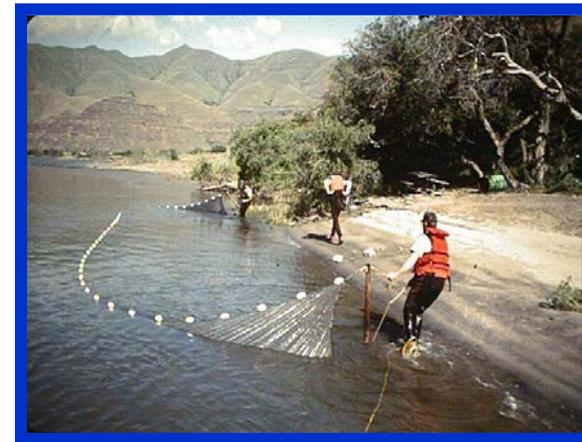




What About the Natural Fish?

- Would it be possible to reduce impacts on natural populations with changes in hatchery release strategies?

Natural Fish Collection



Natural Fish Tagging

Year	Group	N	PIT's	Release dates		Fork length
				min	max	
2008	Acclimated	512,745	14,757	05/28	05/28	69 ± 6
	Direct	230,401	15,807	05/28	05/28	72 ± 6
	Natural		6,755	04/22	07/16	64 ± 11
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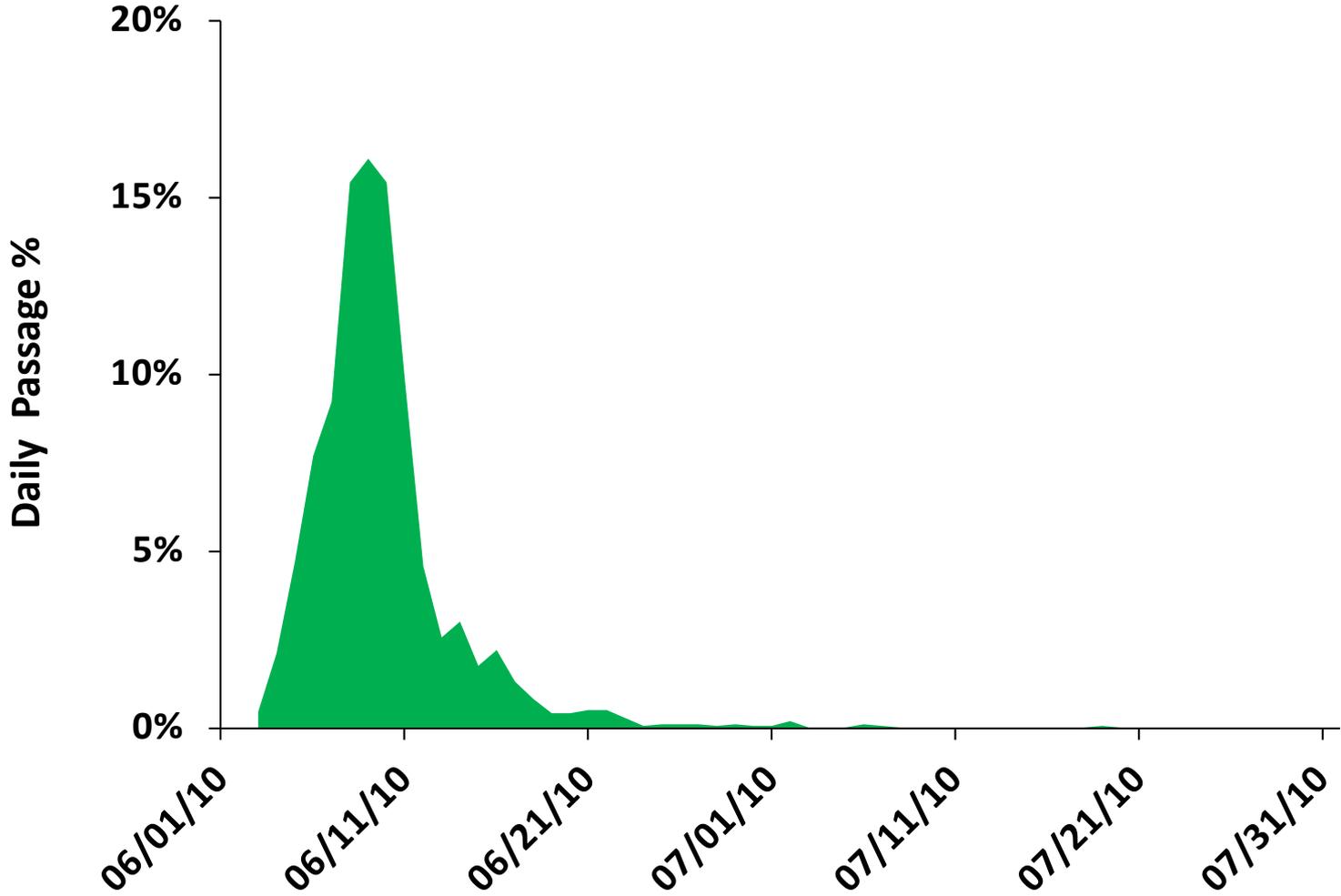
Niche Overlap

Potential for;

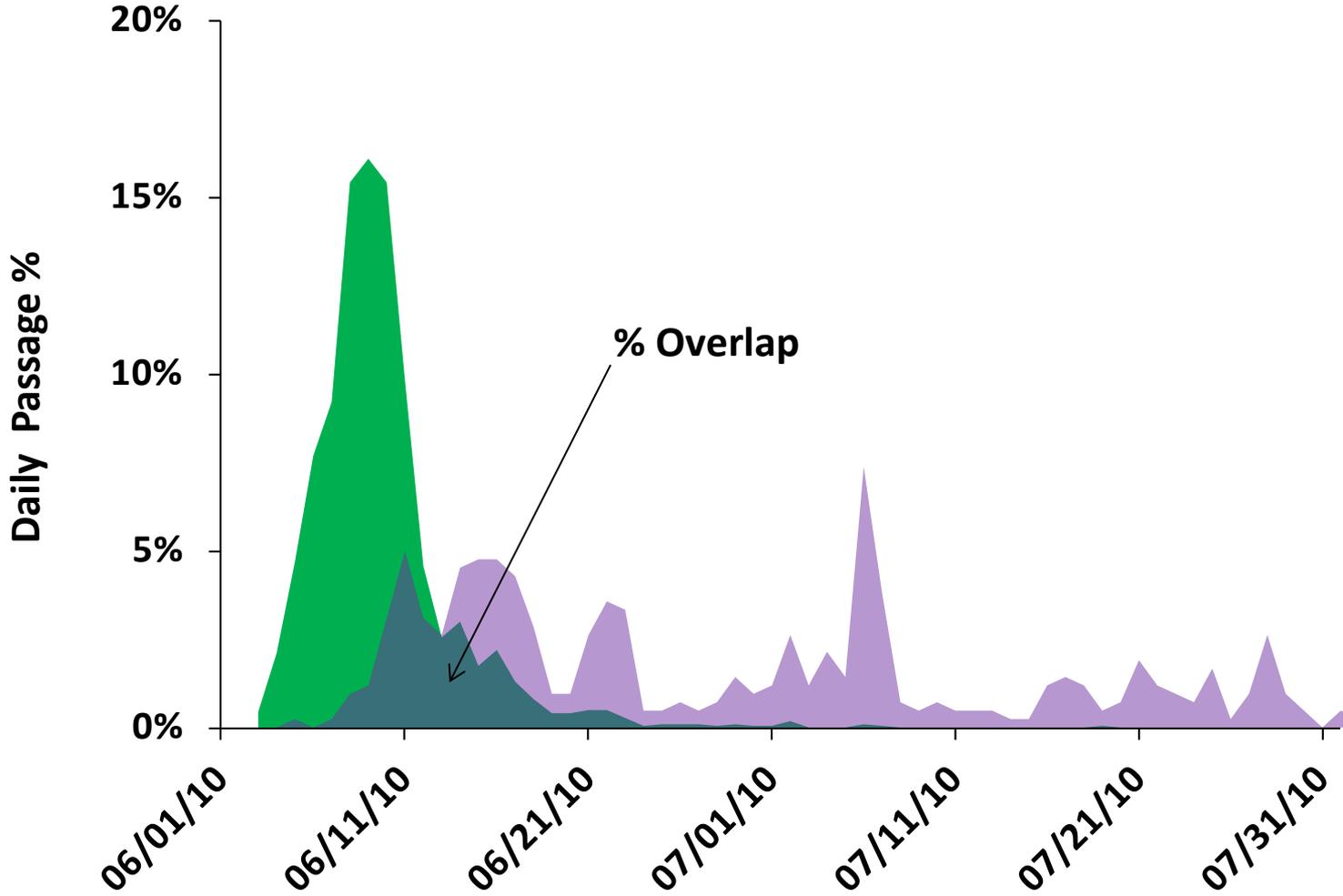
- Aggressive/Non-aggressive Interaction
- Competition
- Disease Transfer
- ???



Niche Overlap

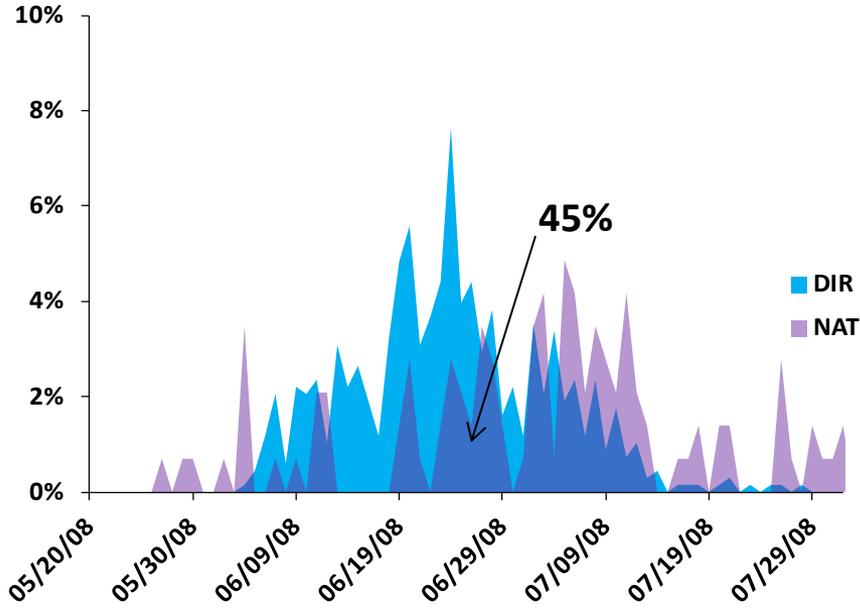
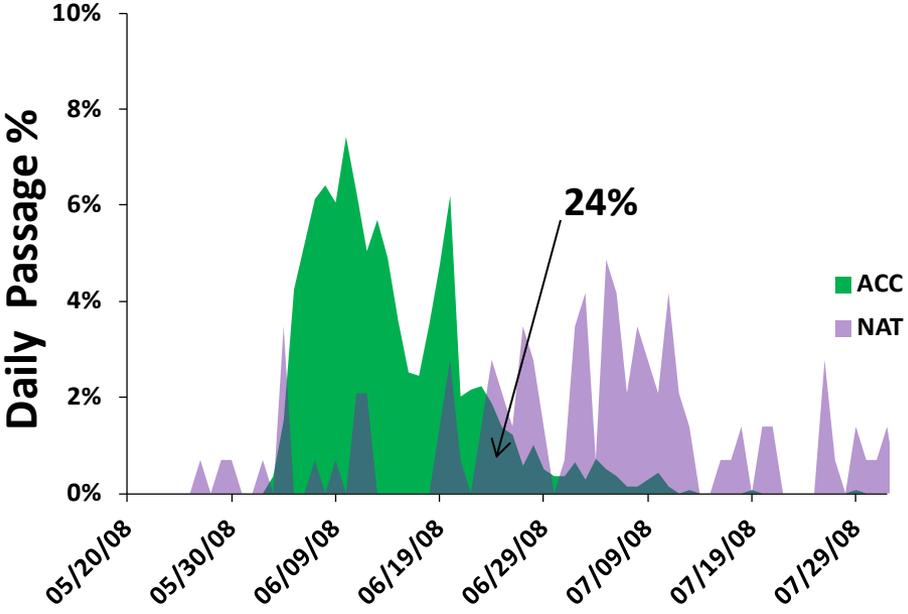


Niche Overlap



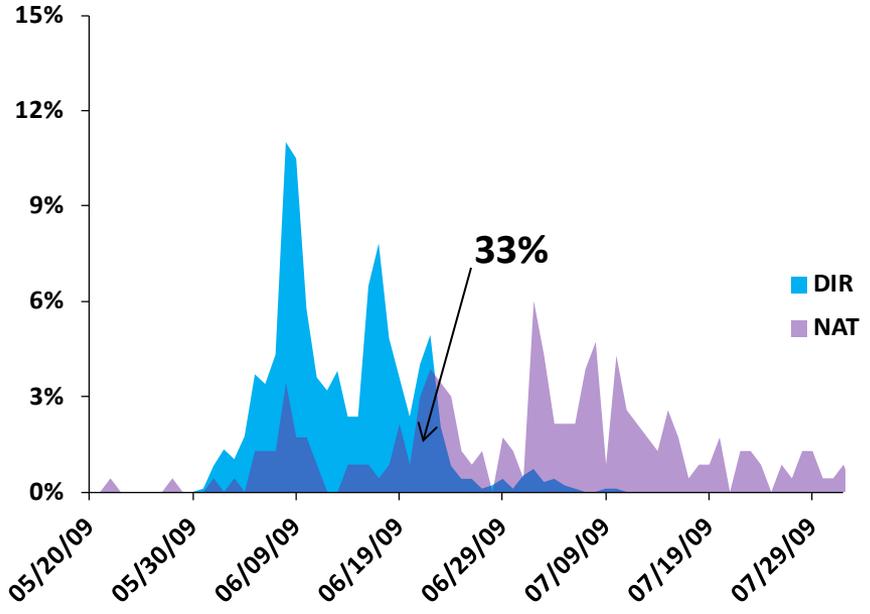
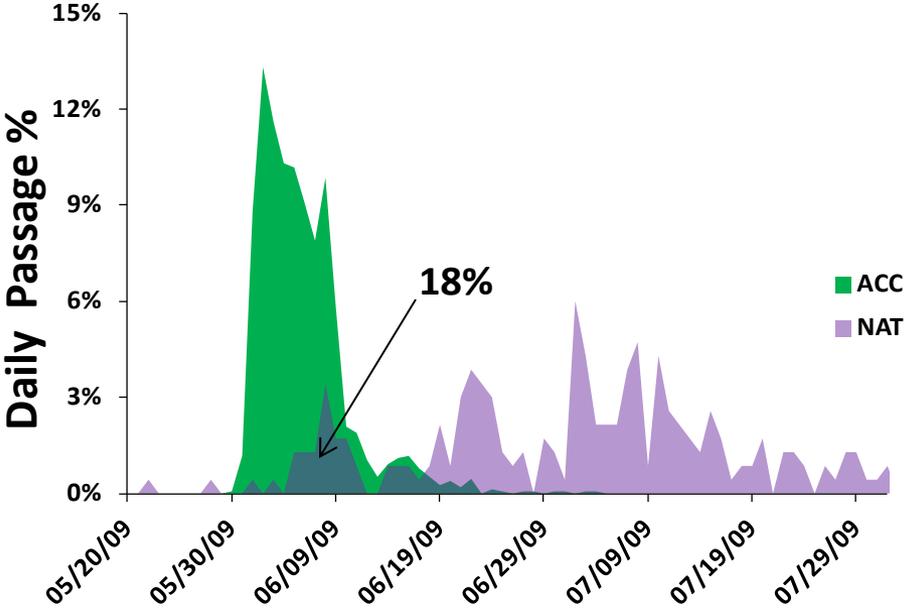
Niche Overlap

(2008)



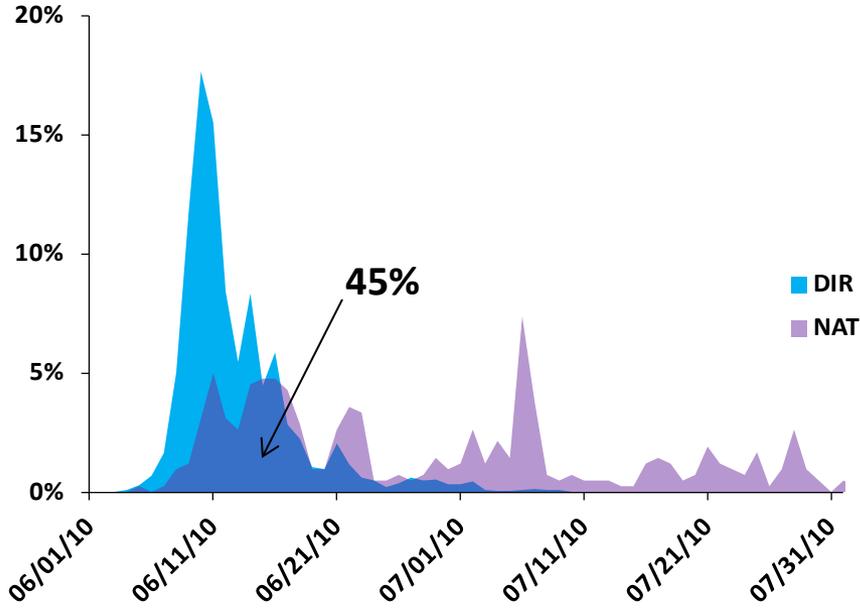
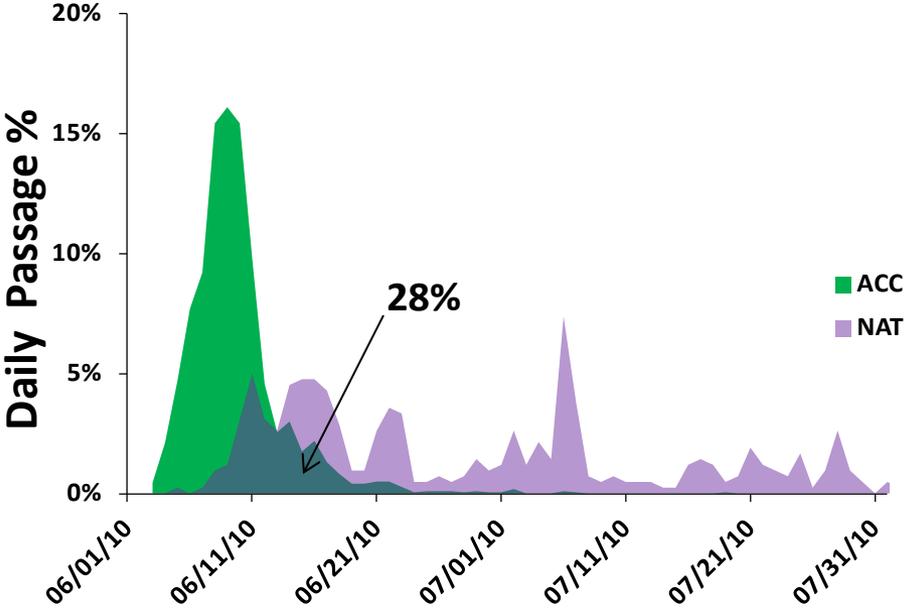
Niche Overlap

(2009)



Niche Overlap

(2010)



Outcomes

- Acclimation increased rate of seaward movement
- Acclimation increased juvenile survival
- Acclimation decreased potential interaction with natural counterparts
- Acclimation increased SARs (preliminary)



Questions?

