

# CHAPTER 4: Double-crested Cormorant Management in the Columbia River Estuary

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# Double-crested Cormorant Colony Size on East Sand Island

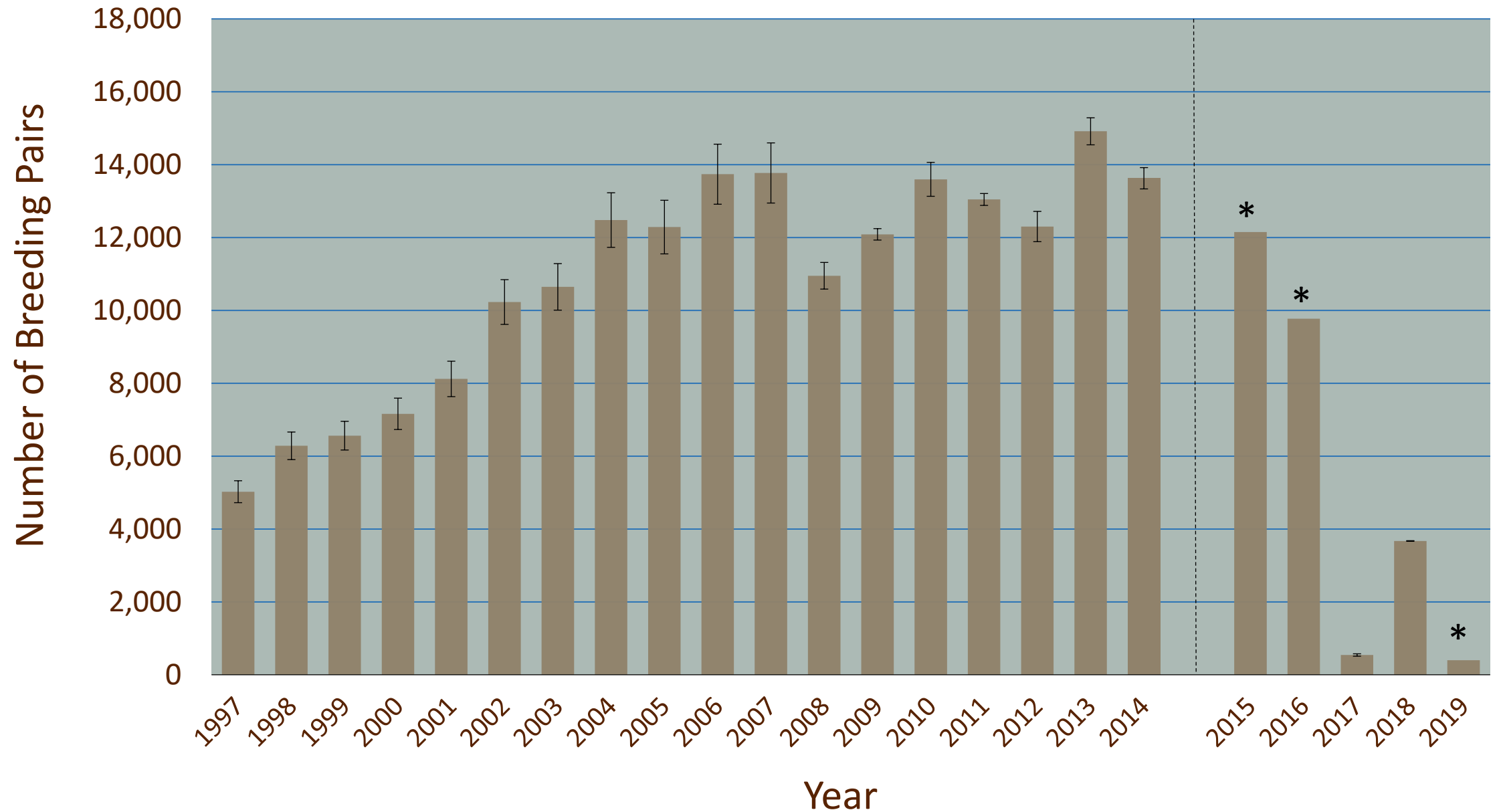


Table 6. Average annual predation rates on salmonid smolts (95% credible intervals) by double-crested cormorants nesting on East Sand Island pre-management and during Phase I and Phase II of management. Asterisks denote statistically credible differences.

Salmonid ESU/DPS	Pre-management	Phase I	Phase II
	2003–2014	2015–2017	2018
UCR Steelhead	6.3% (5.5–7.2%)	5.8% (4.5–8.1%)	0.7% (0.4–1.4%)*
UCR Sp Chinook Salmon	3.8% (3.2–4.6%)	4.1% (3.2–5.8%)	0.6% (0.3–1.2%)*
SR Steelhead	7.2% (6.3–8.5%)	6.8% (5.3–9.4%)	0.5% (0.3–0.9%)*
SR Sp/Su Chinook Salmon	4.6% (4.1–5.3%)	6.8% (5.3–9.4%)	0.5% (0.3–0.8%)*
SR Fall Chinook Salmon	2.7% (2.3–3.2%)	3.7% (2.6–5.4%)	0.9% (0.5–1.6%)*
SR Sockeye Salmon	4.2% (3.3–5.3%)	2.4% (1.4–4.0%)	0.9% (0.4–1.9%)*
MCR Steelhead	7.5% (6.3–9.3%)	5.4% (4.0–7.0%)	0.4% (0.1–1.0%)*
UWR Sp Chinook Salmon	1.8% (1.3–2.6%)	1.4% (0.6–2.9%)	NA
LCR Steelhead	5.4% (4.5–6.3%)	5.0% (3.7–6.9%)	0.6% (0.3–1.0%)*
LCR Chinook Salmon	27.5% (24.3–30.7%)*	8.7% (6.2–12.1%)*	7.3% (4.8–11.6%)*
LCR Coho Salmon	15.0% (12.2–18.1%)*	0.2% (0.0–0.7%)*	0.3% (0.1–0.8%)*

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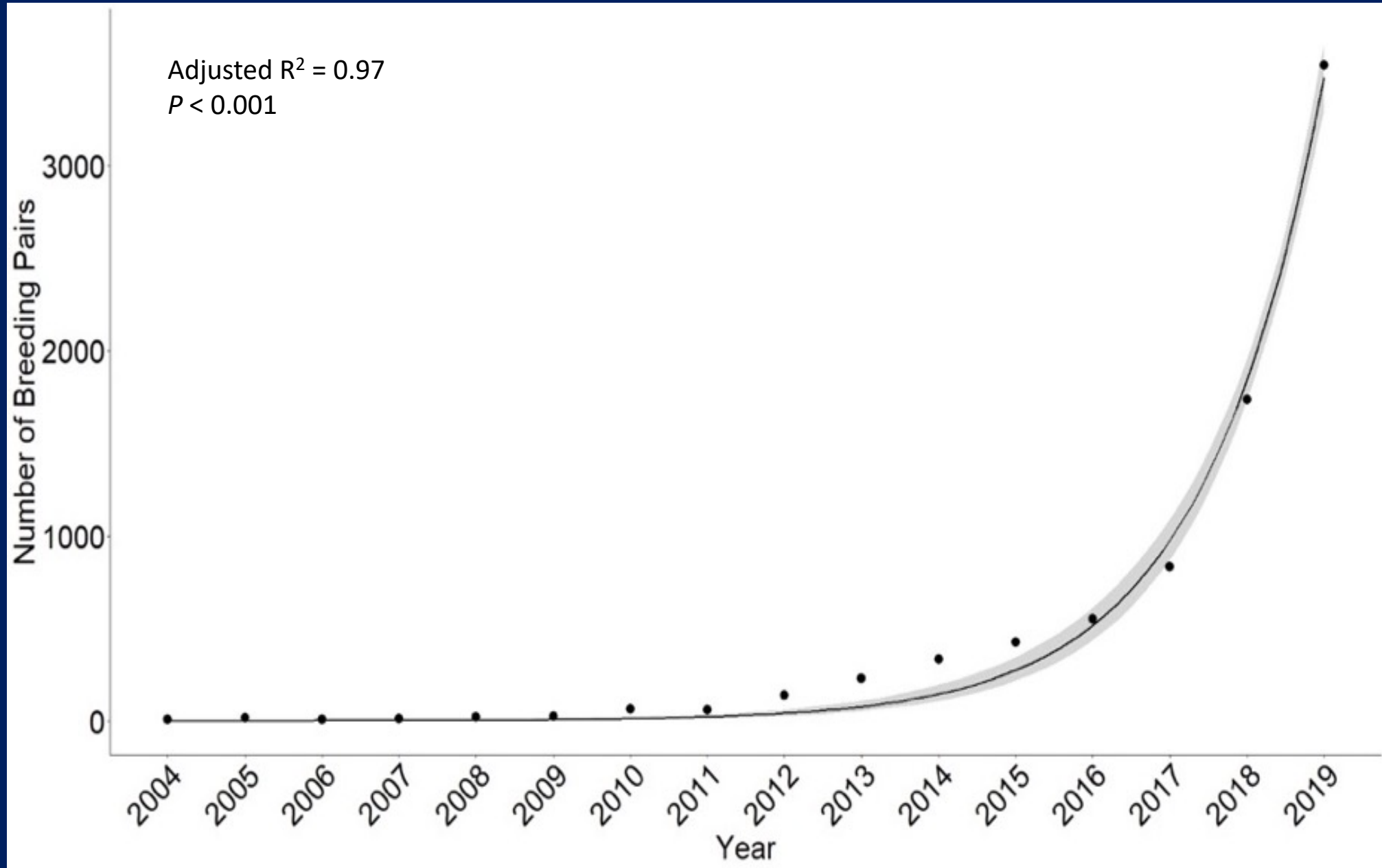
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# Double-crested Cormorant Colony Size on the Astoria-Megler Bridge



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- The objective of the *Cormorant Management Plan* to limit predation on salmonid smolts by reducing the size of the double-crested cormorant colony on East Sand Island to no more than 5,380–5,939 breeding pairs during Phase I of the Plan was achieved earlier than expected

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- The *Cormorant Management Plan* has been completed without the Pacific Flyway population of double-crested cormorants declining below levels anticipated by the U.S. Fish and Wildlife Service

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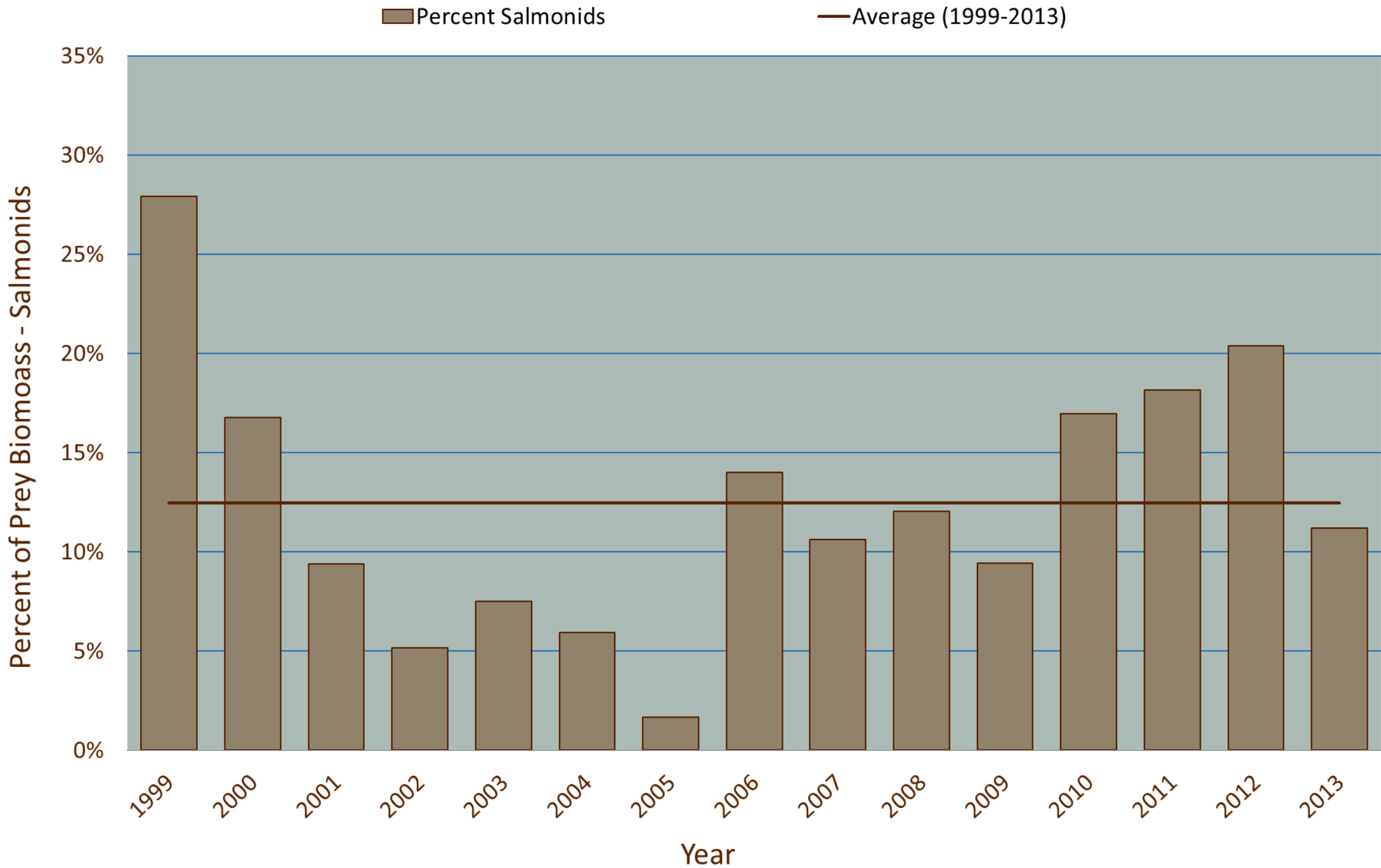
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  - Preventing formation of other breeding colonies of double-crested cormorants in the Columbia River estuary, especially upstream of East Sand Island
  - Continuing to monitor the Pacific Flyway population of double-crested cormorants for early detection of major unanticipated population declines

# Back-up Slides

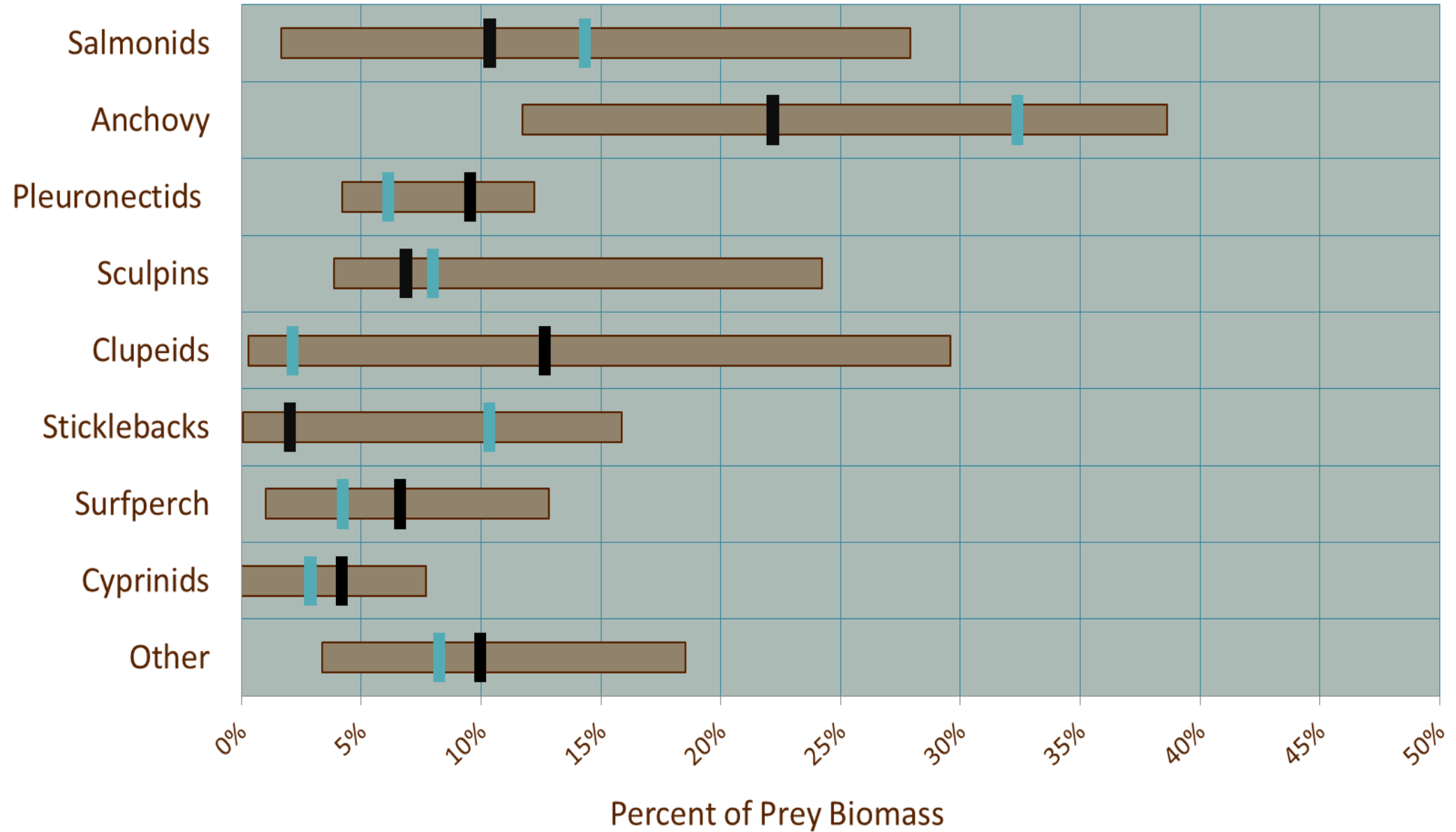


Table 10. Maximum allowable lethal take authorized under permit and actual take of double-crested cormorant adults, double-crested cormorant nests oiled, and double-crested cormorant eggs destroyed as part of implementation of the *Double-crested Cormorant Management Plan*.

	Maximum Permitted Take			Actual Take (% of permitted take)		
Year	<u>Adults</u>	<u>Nests</u>	<u>Eggs</u>	<u>Adults</u>	<u>Nests</u>	<u>Eggs</u>
<b>2015</b>	3,489	5,879	--	2,346 (67%)	5,089 (87%)	--
<b>2016</b>	3,114	5,247	--	2,982 (96%)	1,092 (21%)	--
<b>2017</b>	2,408	4,058	--	248 (10%)	0 (0%)	--
<b>2018</b>	0	0	500	NA	NA	3 (0.6%)
<b>Total</b>	9,011	15,184	500	5,576	6,181	3



■ Range (1999-2013)   ■ Average (1999-2005)   ■ Average (2006-2013)



■ Range (1998-2013)

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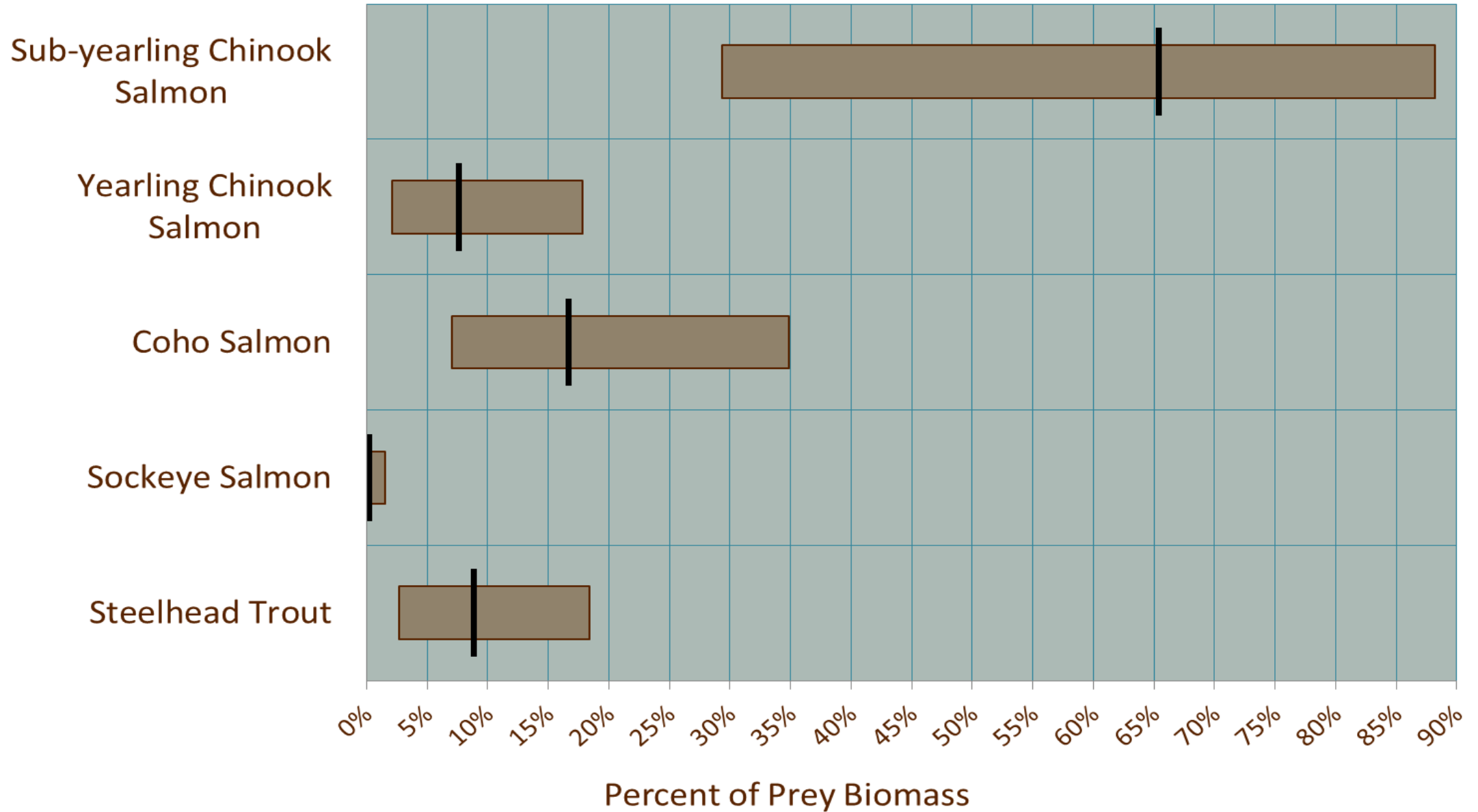
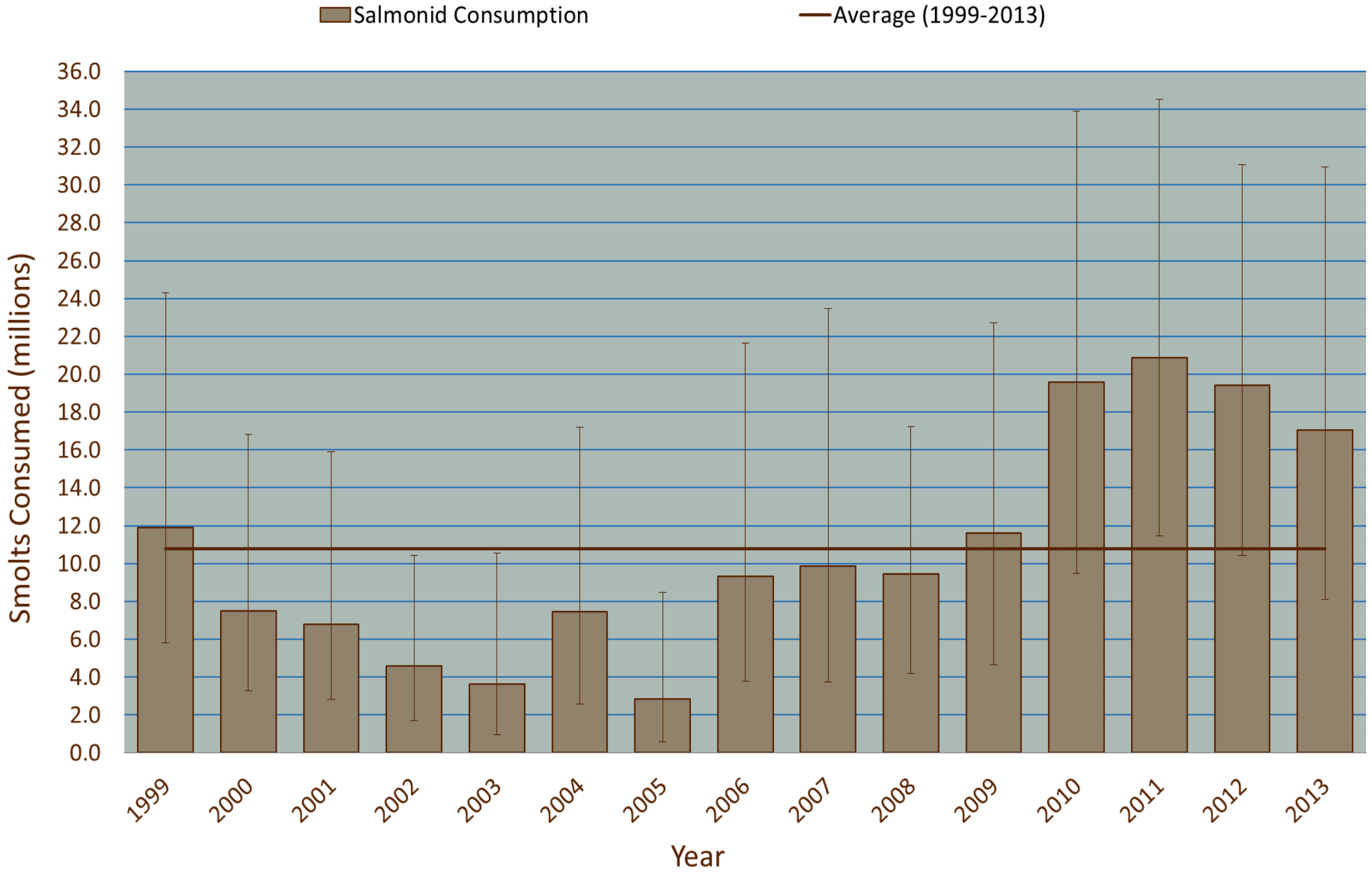
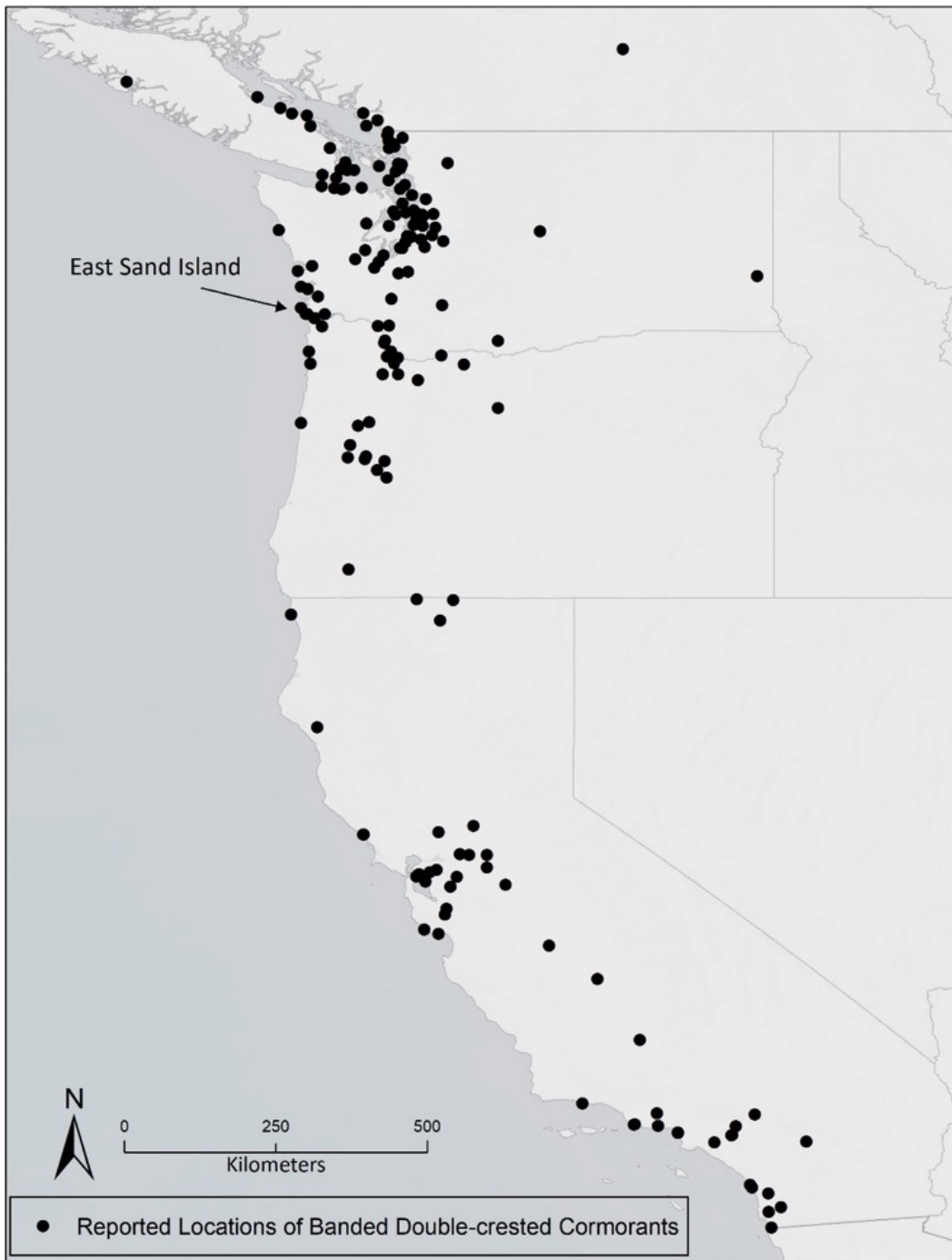


Table 4.1. Proportional breakdown (by frequency) of salmonids by species/age-class in stomachs of double-crested cormorants collected near East Sand Island in the Columbia River estuary during 2000 – 2013.

Species/Age-class	Time Period			
	3/27–5/7	5/8–6/4	6/5–7/2	7/3–7/30
Sub-yearling Chinook	0.03	0.18	0.87	0.91
Yearling Chinook	0.10	0.19	0.03	0.00
Coho Salmon	0.54	0.32	0.03	0.01
Sockeye Salmon	0.00	0.02	0.00	0.00
Steelhead	0.33	0.29	0.07	0.08
# of Identified Juvenile Salmonids	68	94	35	25

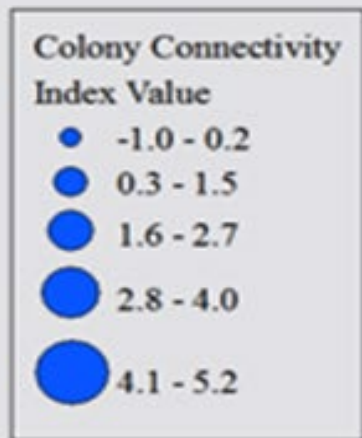






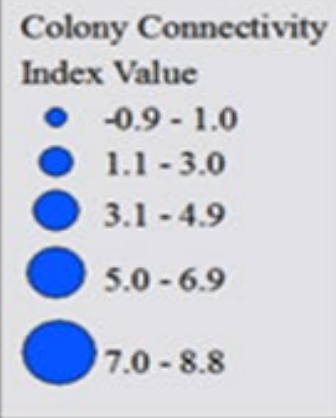
A

Breeding Season



B

Non-Breeding Season











# Former Cormorant Nesting Area on East Sand Island



