Oh, crap! Was that TODAY?
REGAN

Winter Distribution of SRKW's

By Ken Balcomb for NMFS/DFO Orca Salmon Workshop

Vancouver, BC 13-15 March 2012

Acknowledgements

- Dave Ellifrit
- Erin Heydenreich
- Mark Malleson
- Mark Sears
- Howard Garrett
- Susan Berta
- John Durban
- Kim Parsons
- Jeanne Hyde
- Brad Hanson
- John Ford
- NOAA Observers
- US Coast Guard
- US Navy
- Bird people
- Whale-watchers
- Ferry people
- Waterfront homeowners

And, of course, the whales,...

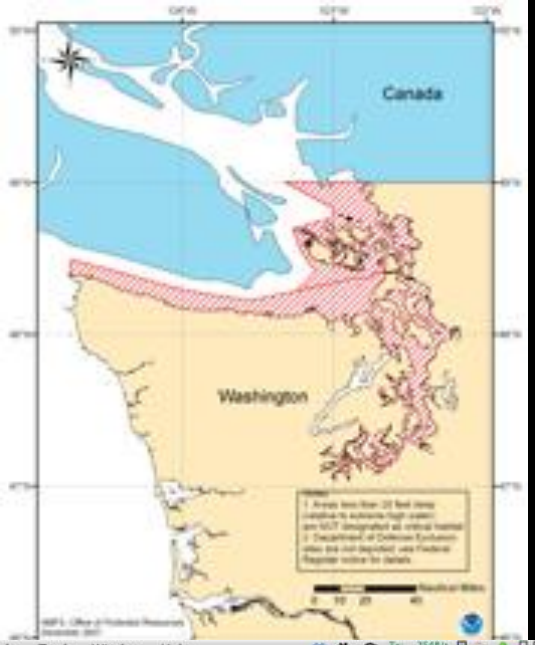
These “resident” whales are rushing toward Vancouver,... for this meeting?

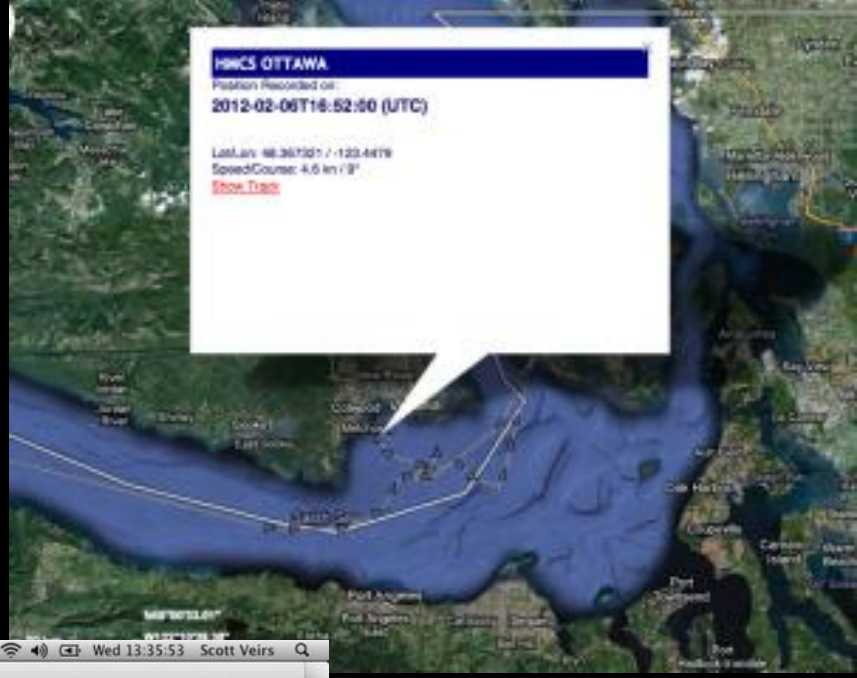
No, they are probably after Fraser River Chinook salmon.

Another ecotype, “Transient” killer whales, eat marine mammals.

So,… what is the distribution of “Resident” Killer Whales?

First I Google searched for images of SRKW habitat,…


Canada
Washington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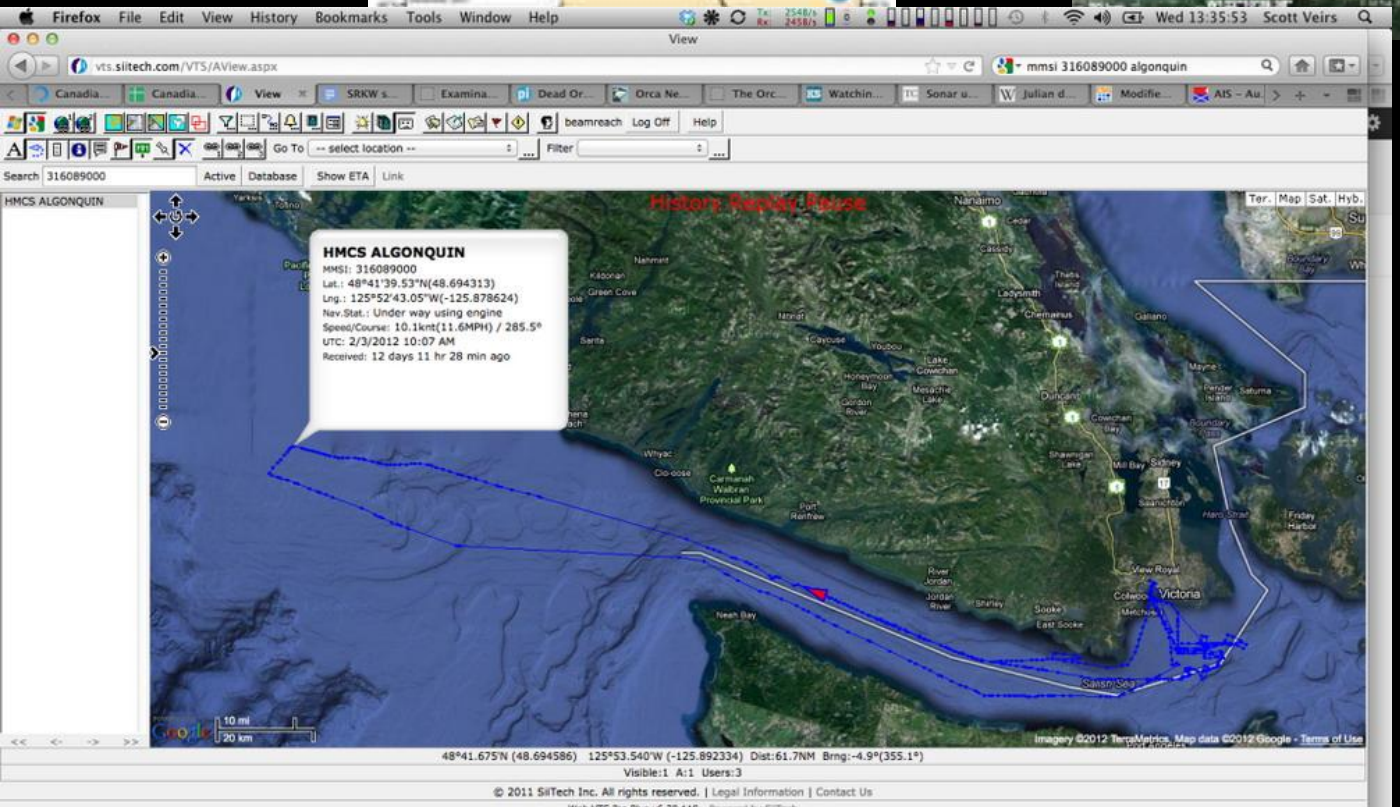
Show Track


Firefox File Edit View History Bookmarks Tools Window Help
Wed 13:35:53 Scott Veirs
View
vts.siitech.com/VTS/AView.aspx
mmsi 316089000 algonquin
beamreach Log Off Help
Go To -- select location --
Filter
Search 316089000
Active Database Show ETA Link
HMCS ALGONQUIN
History Replay Pause
HMCS ALGONQUIN
MMSI: 316089000
Lat.: 48°41'39.53"N(48.694313)
Lng.: 125°52'43.05"W(-125.878624)
Nav.Stat.: Under way using engine
Speed/Course: 10.1knt(11.6MPH) / 285.5°
UTC: 2/3/2012 10:07 AM
Received: 12 days 11 hr 28 min ago
Ter. Map Sat. Hyb.
Nanaimo
Victoria
Imagery ©2012 TerraMetrics, Map data ©2012 Google - Terms of Use
48°41.675'N (48.694586) 125°53.540'W (-125.892334) Dist:61.7NM Brng:-4.9°(355.1°)
Visible:1 A:1 Users:3
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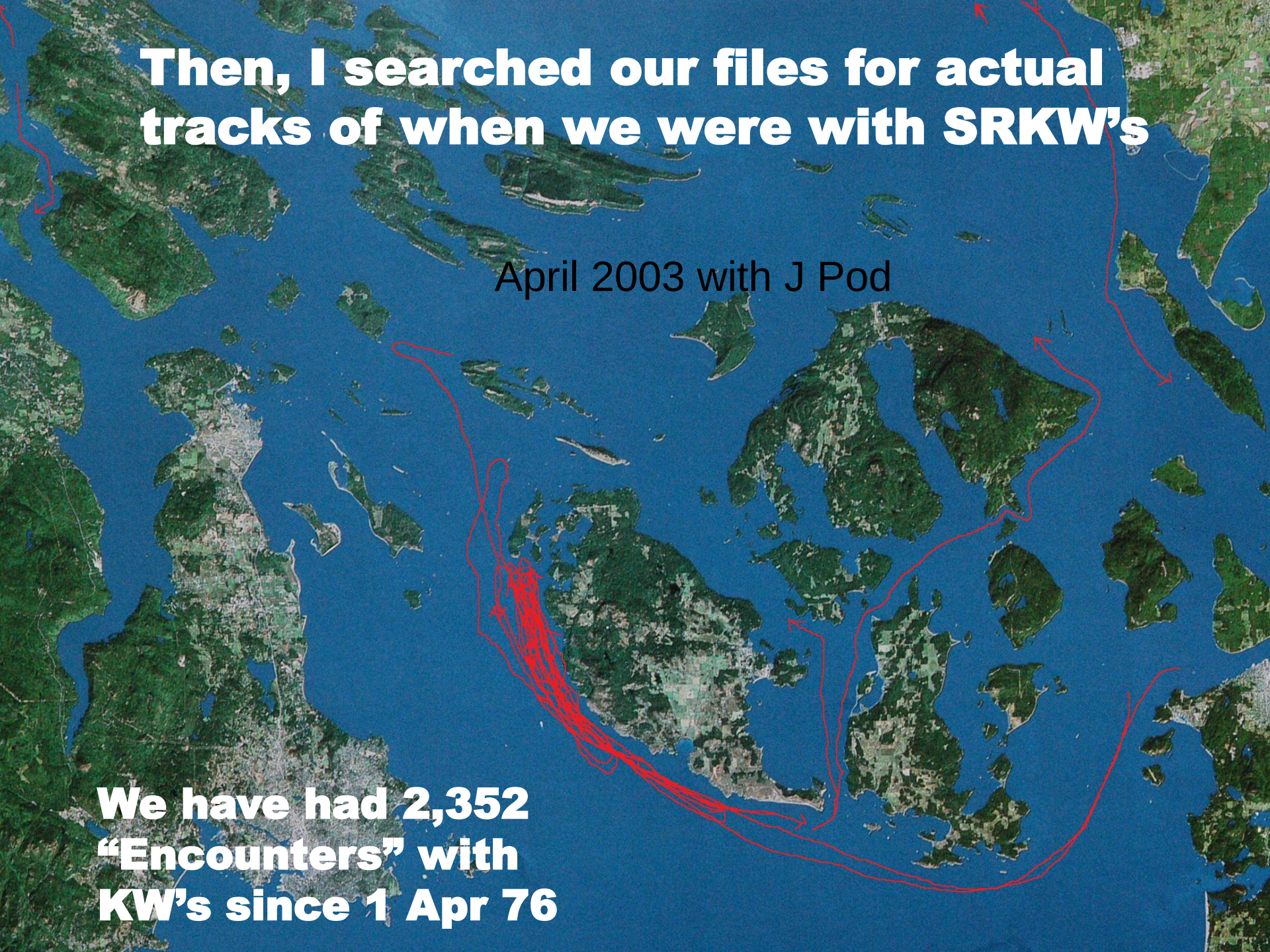
Then, I searched our files for actual tracks of when we were with SRKW's

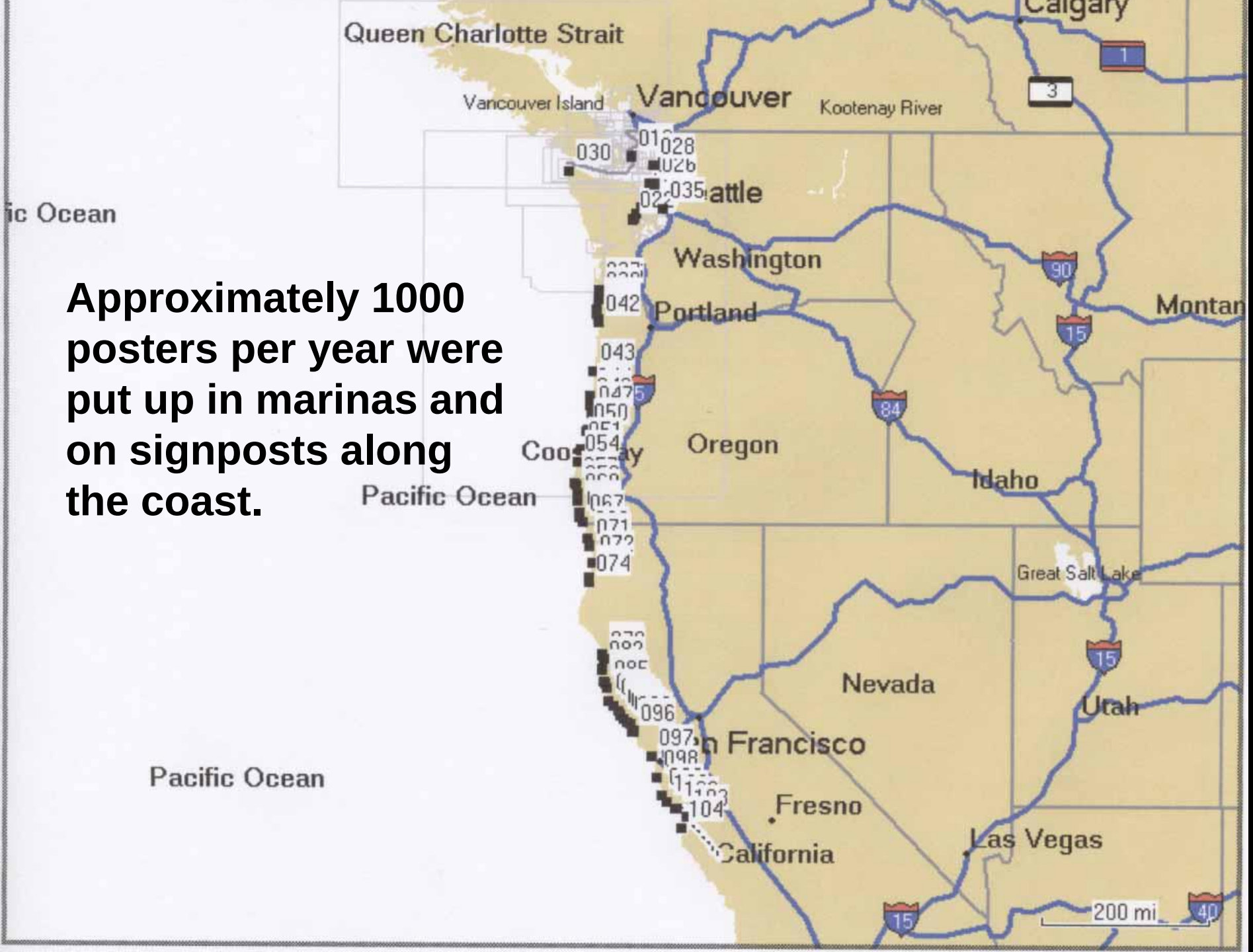
April 2003 with J Pod



We have had 2,352 "Encounters" with KW's since 1 Apr 76

Then, I hit the road,...

In order to find out what the people might know, I distributed posters all along the coast from WA to CA seeking public reports of killer whale sightings.

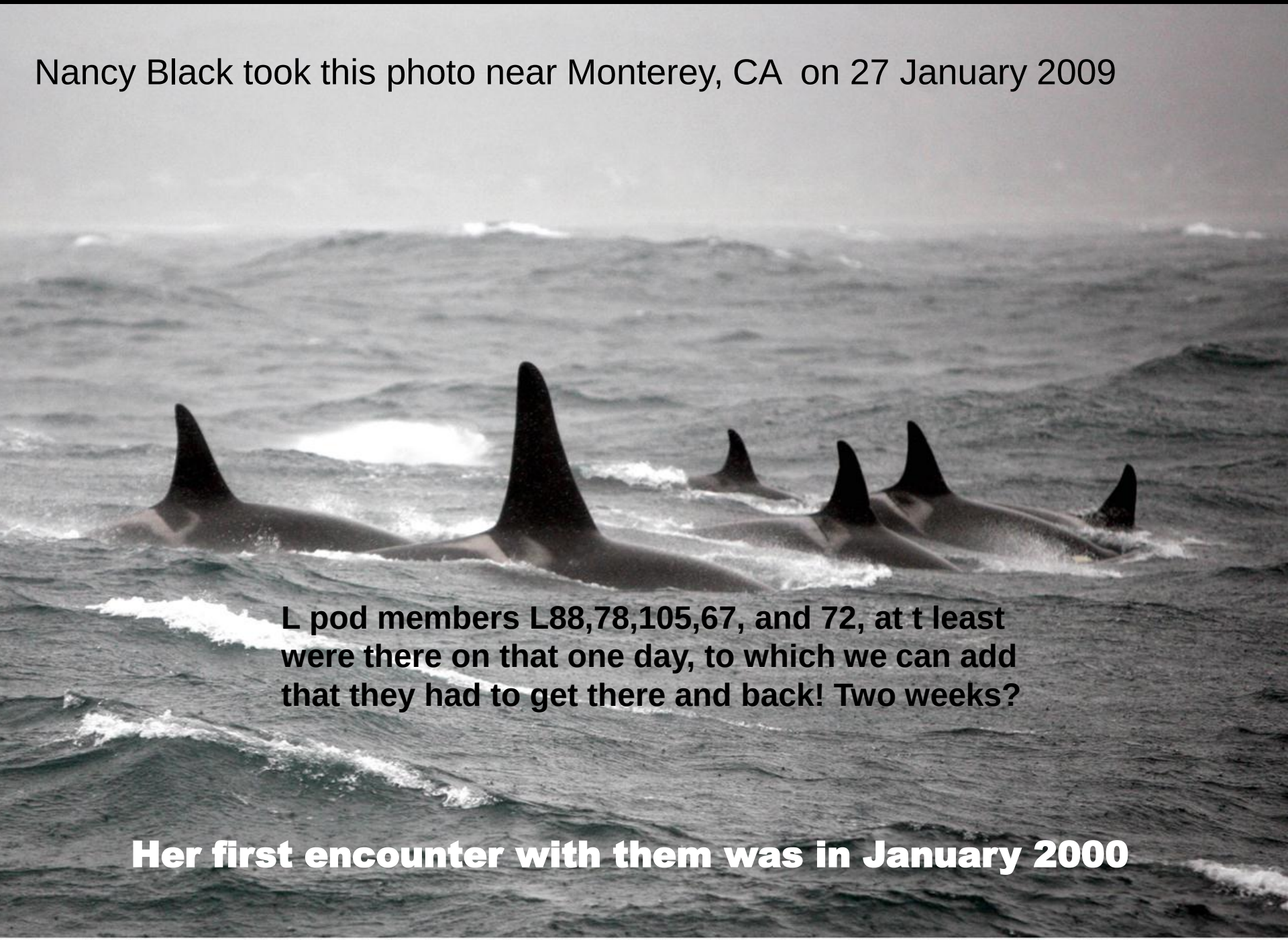


Approximately 1000 posters per year were put up in marinas and on signposts along the coast.

Photographs were solicited and obtained serendipitously from whalewatchers and seafarers, for example this one from Newport, Oregon

This early photograph from Newport, Oregon evidenced that our SRKW's went at least that far along the coast.

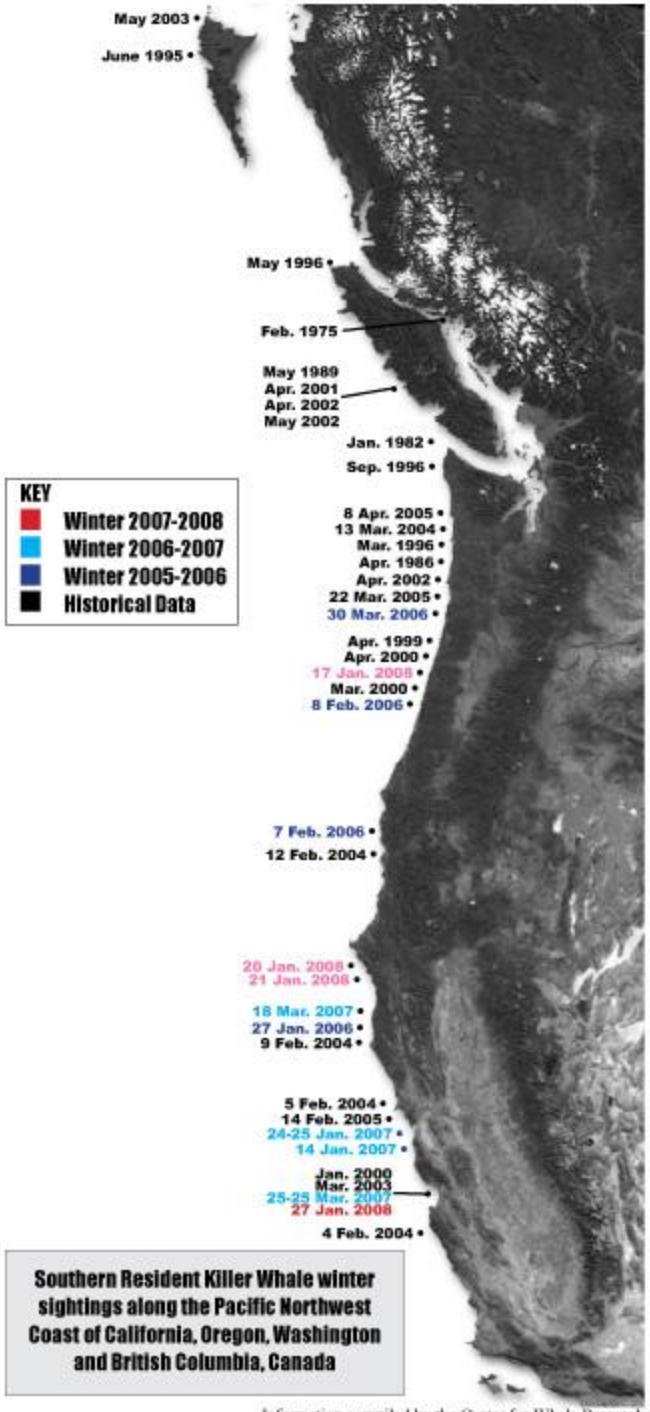
Nancy Black took this photo near Monterey, CA on 27 January 2009



L pod members L88,78,105,67, and 72, at t least were there on that one day, to which we can add that they had to get there and back! Two weeks?

Her first encounter with them was in January 2000

lit: Nancy Black/Monterey Bay Whale Watch. Cutline: From left, L-88, L-78, L-105, L-67 and L72 surface southbound off Cypress Point, California, January 27, 2008

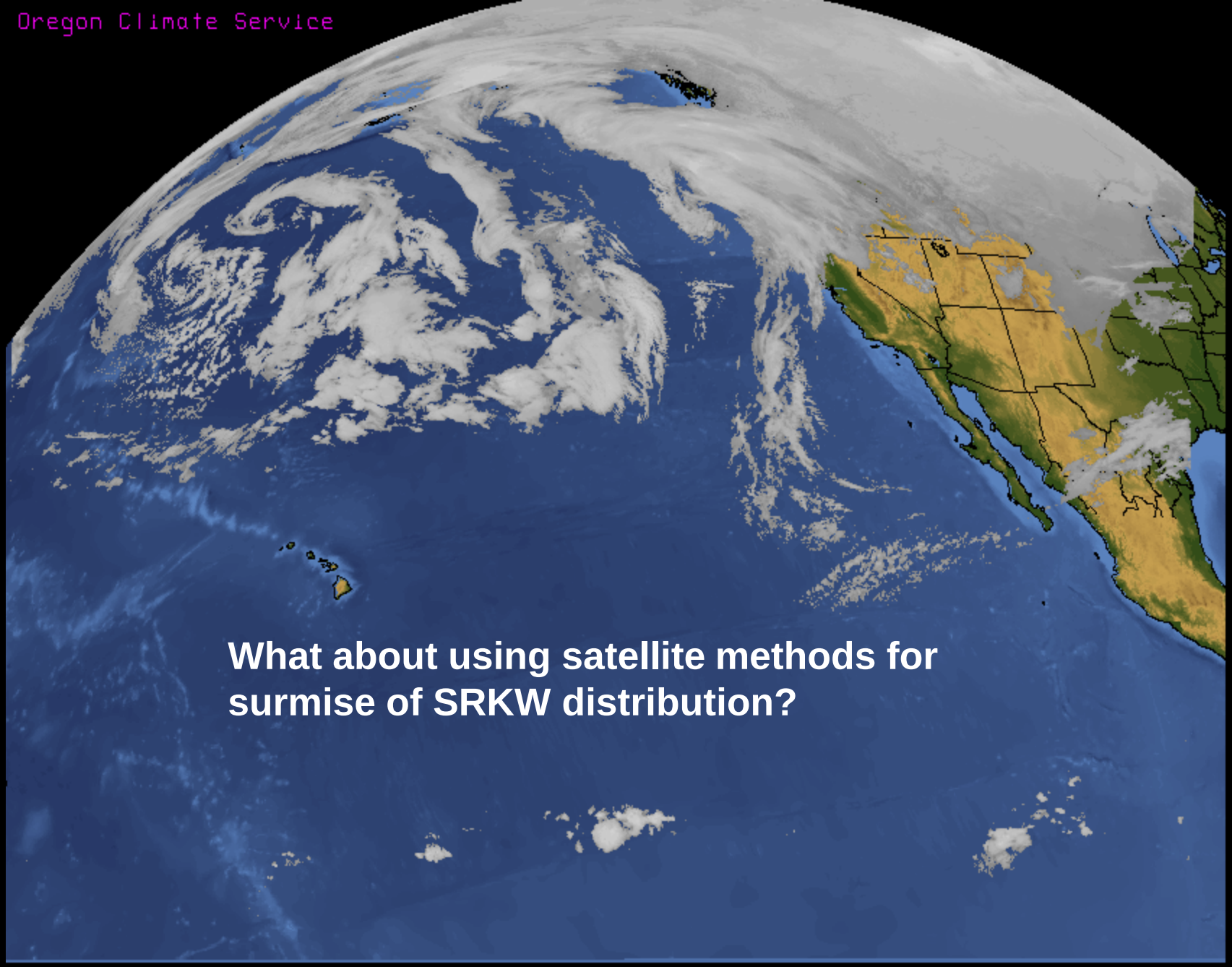


In fact, as best we can determine during each of the past eleven winters a majority of the SRKW's (L and sometimes K pod) have departed the inland marine waters of the Salish Sea in December or January and many have traveled south as far as Monterey Bay, California by late January or February. Their return north typically brings them to the OR/WA border by April or May although in some years they may travel as far north as the Queen Charlotte Islands by May (and SEAK in June!!). Their travels are variable, as in the example of K pod being seen in Knight Inlet in Spring a couple of years ago. Typically, all of the SRKW's return to the inland marine waters of Georgia Strait and Puget Sound by June or July each year, and travel in and out of the Strait of Juan de Fuca with almost weekly regularity through the summer and early autumn months.

The map to the left requires updating for 2009-2012, but the distribution is much the same.

Summary of Sighting Reports 2007-2012

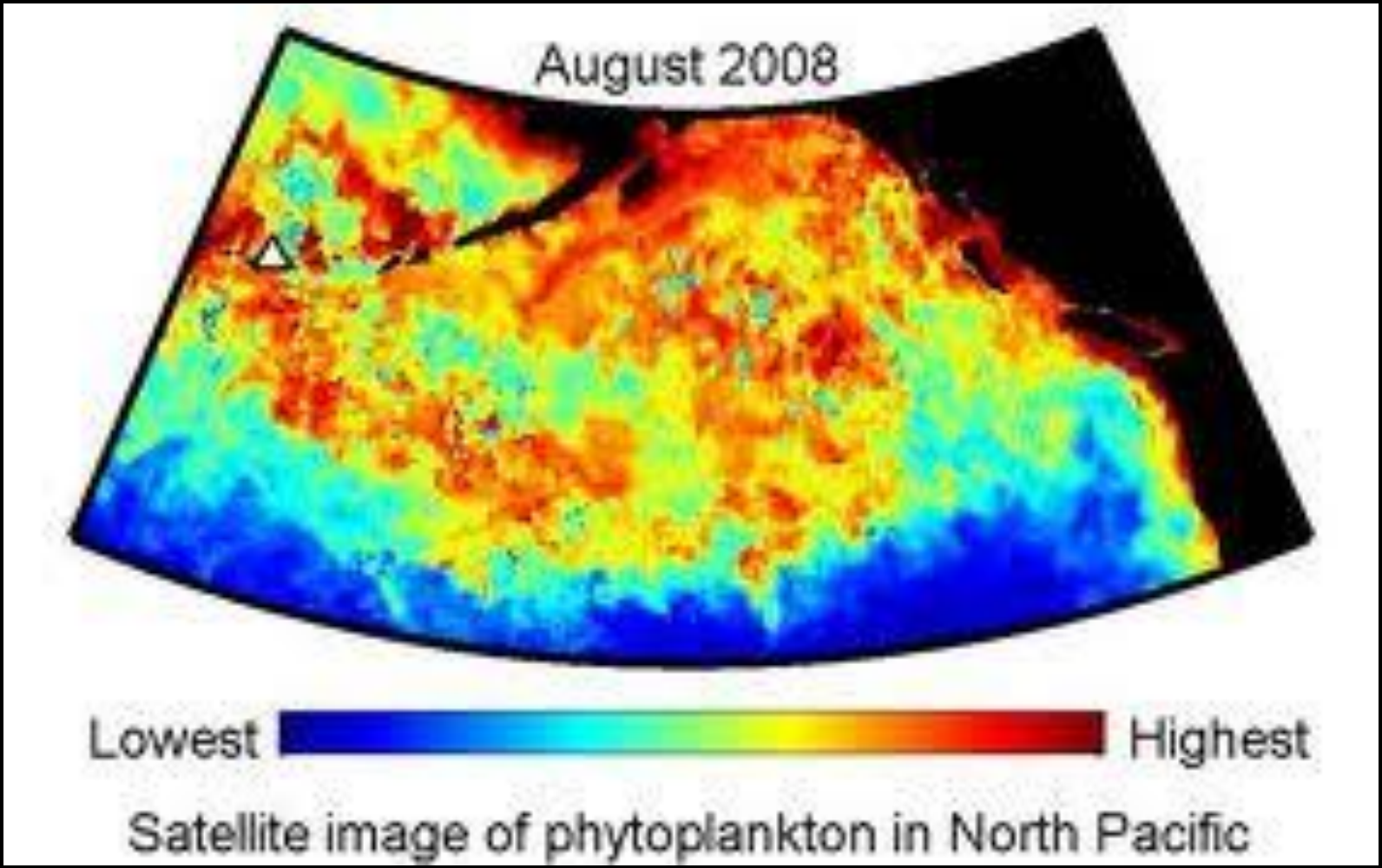
- 6,094 whale sighting reports from public
- 372 of these from outer coast
- CA transient = 29
- Southern residents = 24
- Northern residents = 1
- Offshores = 4
- Known transients = 11
- Unknown transients = 30



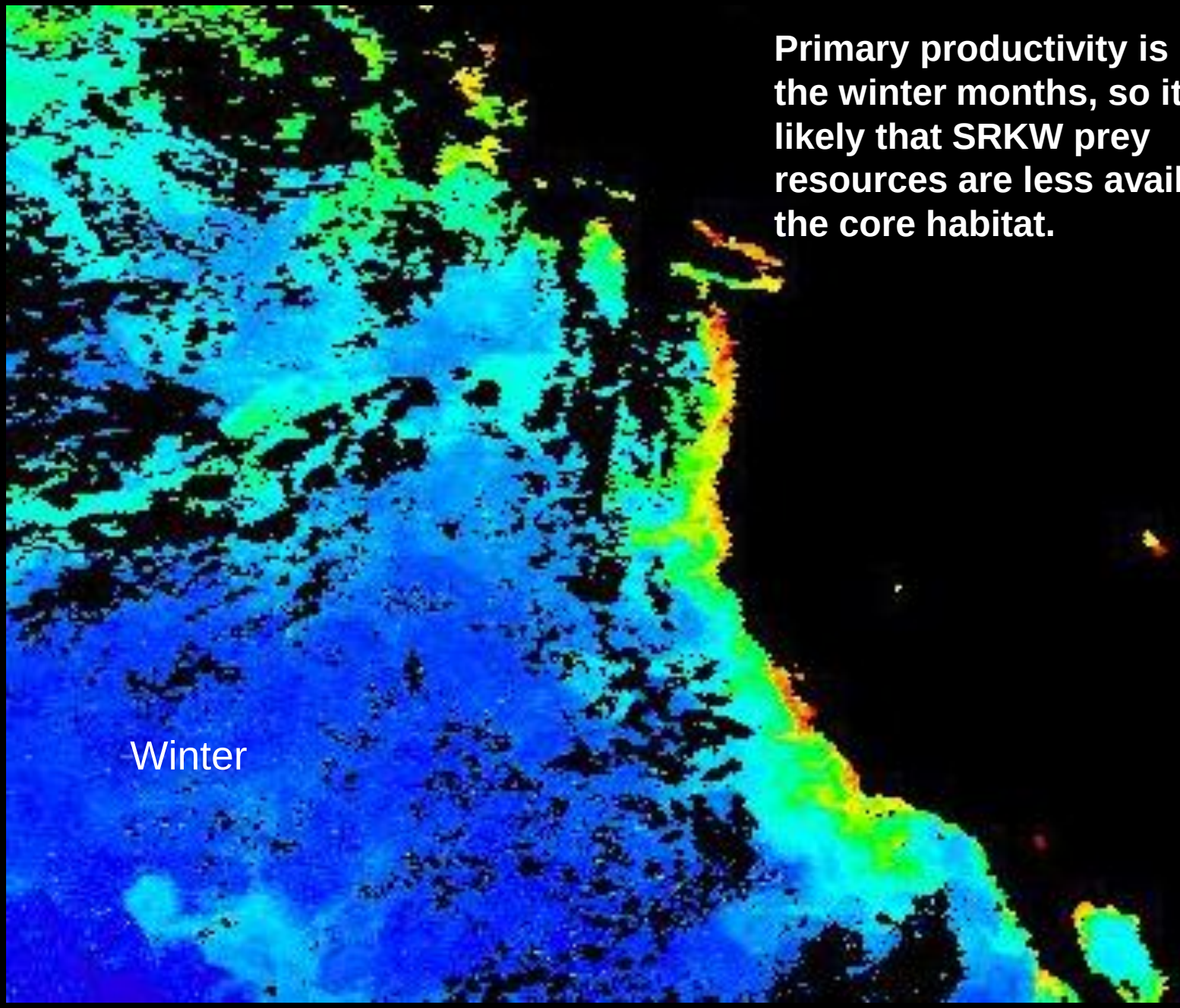
What about using satellite methods for surmise of SRKW distribution?

We know that killer whales are at the top of the food web, so lets look at

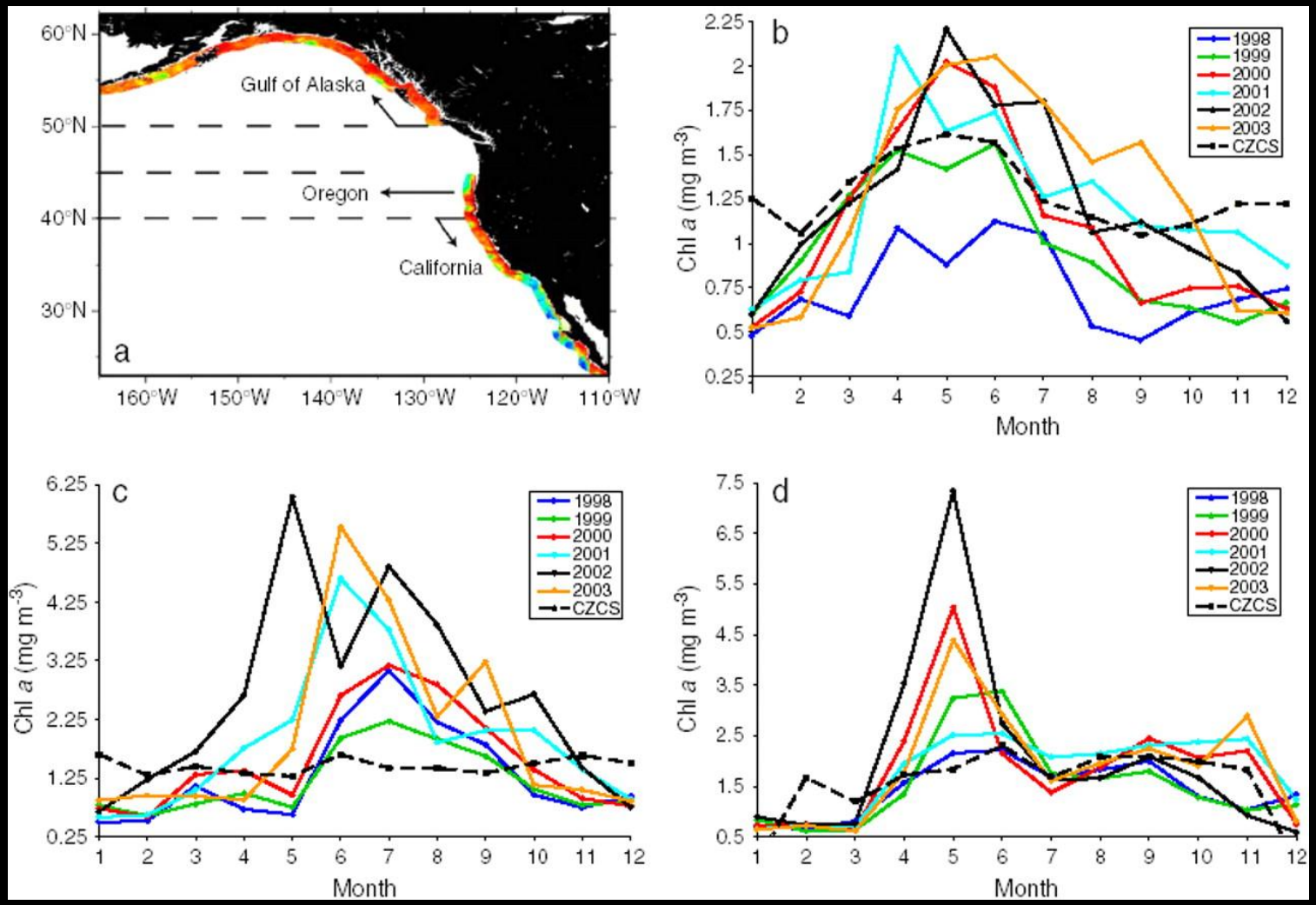
Primary Productivity

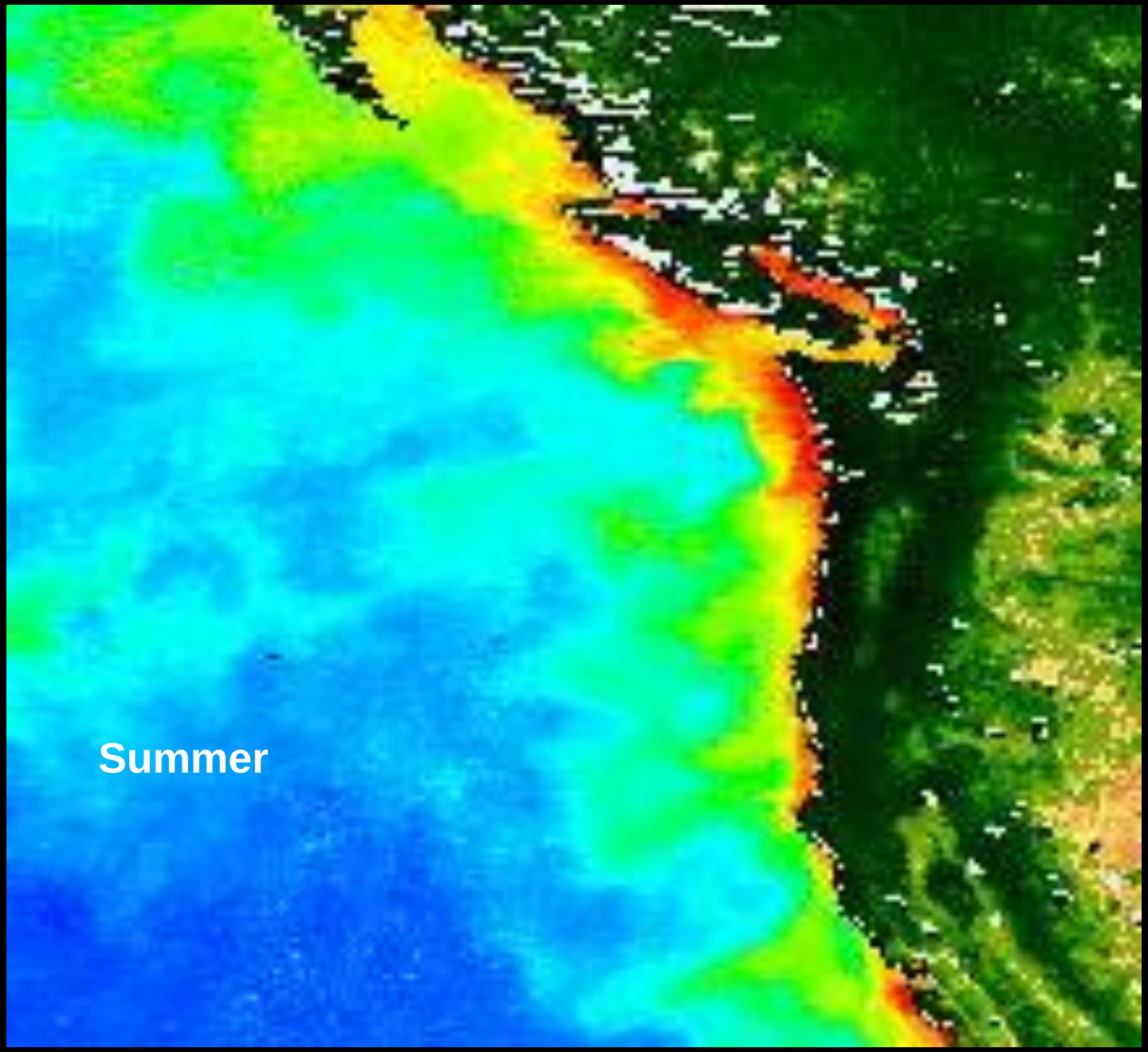


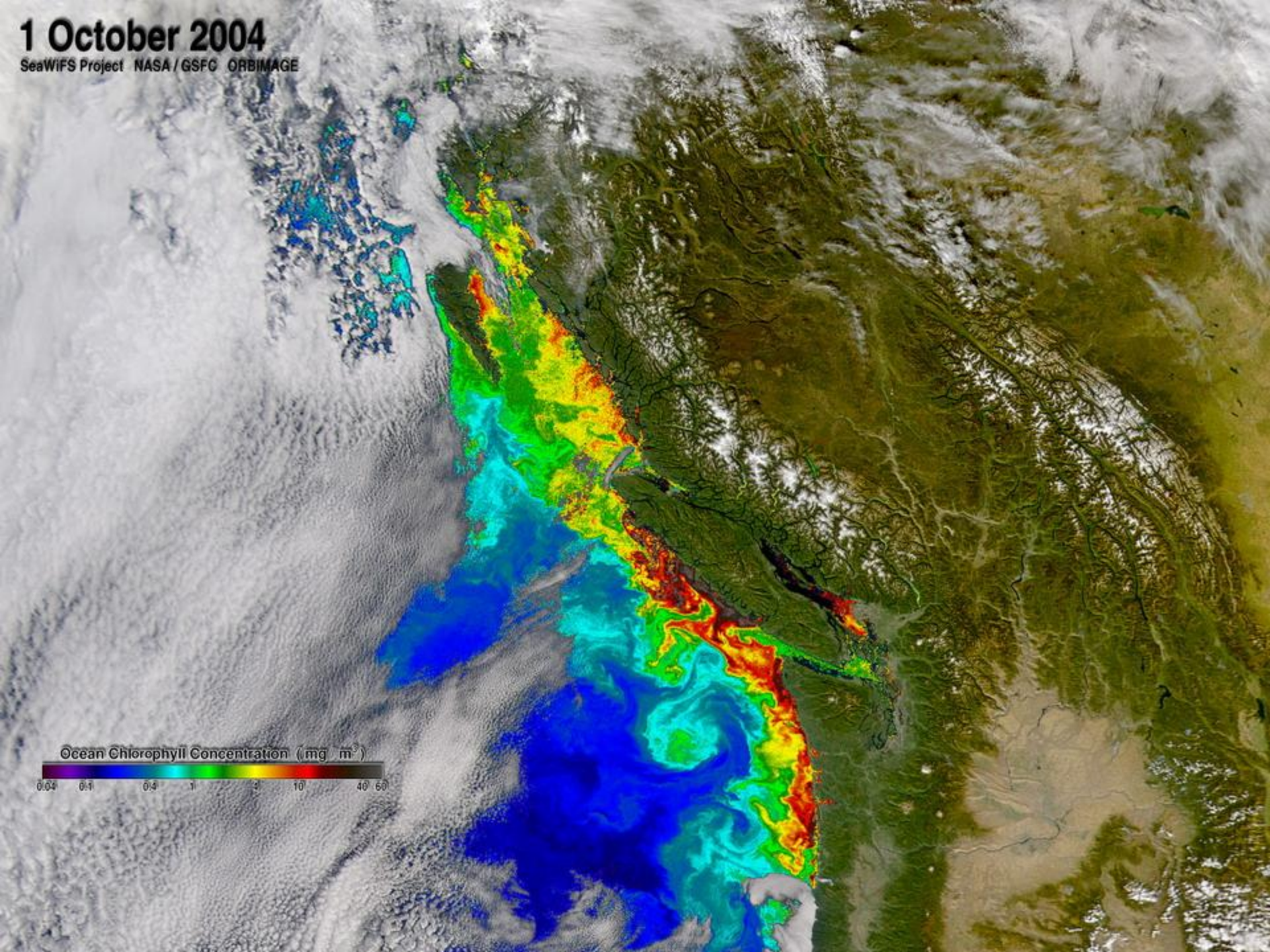
Satellite image of phytoplankton in North Pacific



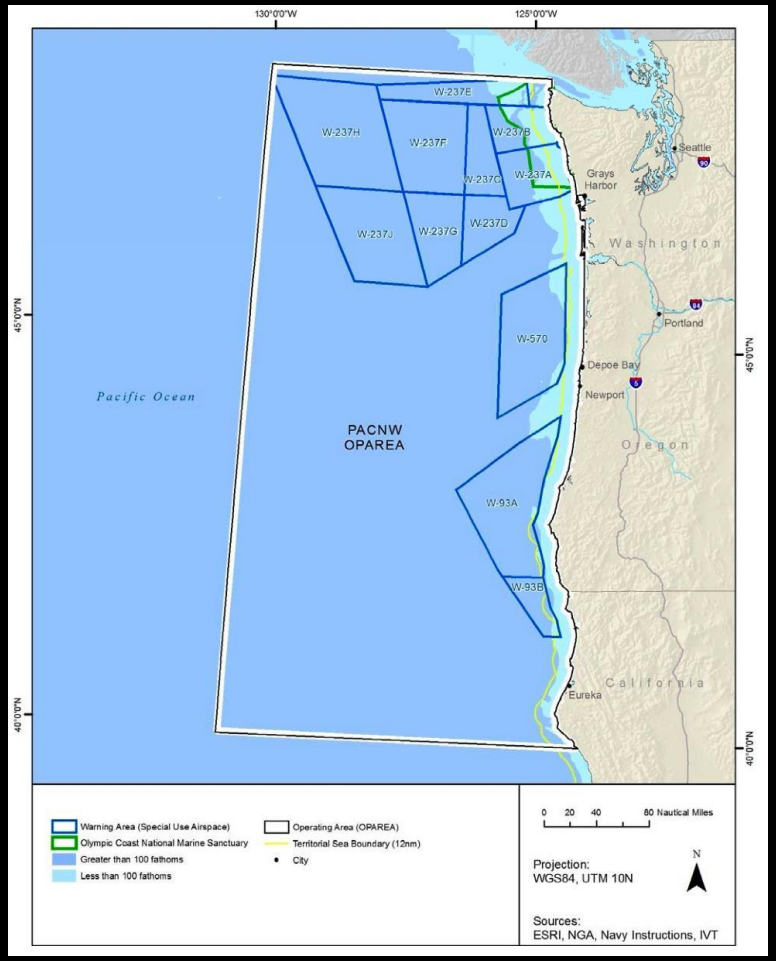
Primary productivity is less in the winter months, so it is likely that SRKW prey resources are less available in the core habitat.


a
60°N
50°N
40°N
30°N
Gulf of Alaska
Oregon
California
160°W
150°W
140°W
130°W
120°W
110°W
b
c
d
Chl a (mg m-3)
Month
1998
1999
2000
2001
2002
2003
CZCS


Summer


1 October 2004
SeaWiFS Project NASA / GSFC ORBIMAGE
Ocean Chlorophyll Concentration (mg m⁻³)
0.04 0.1 0.4 1 2 10 40 60

Pacific Northwest Training Areas



MK 82 500 pound bomb

contains 192 lbs of Tritonol high explosive

- 96 MK 82 bombs per year are dropped during VP training missions in W237 and W570. Approximately 24% are live, and the remaining 76% are concrete and steel. 96% of the ordnance explodes in the top five feet of the water column.

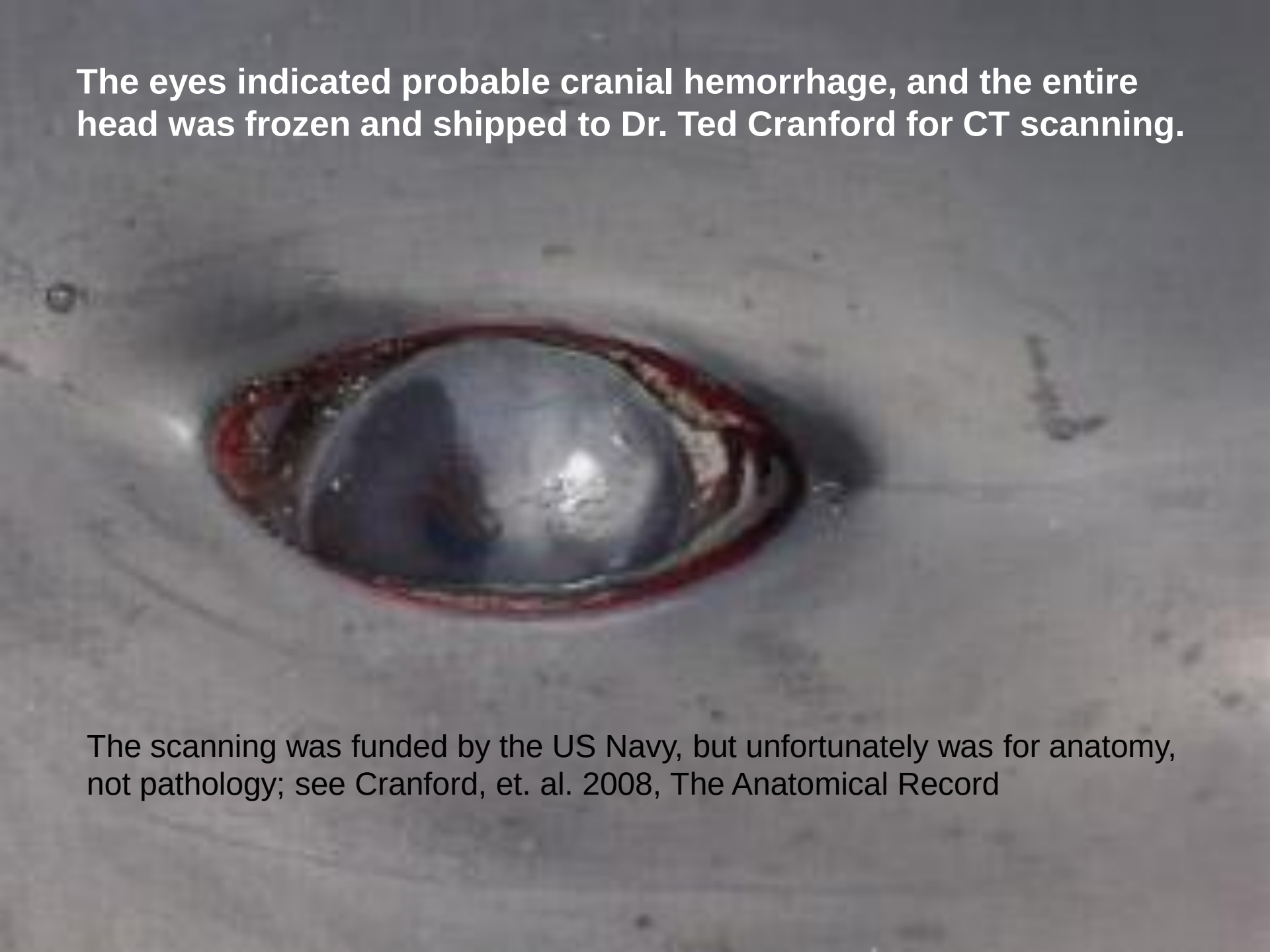
Is this the result?

L60 washed in at Long Beach, WA April 2002

A month earlier: Cuvier's beaked Whale 13 March 2002

This one came in alive, but died thrashing on the beach.

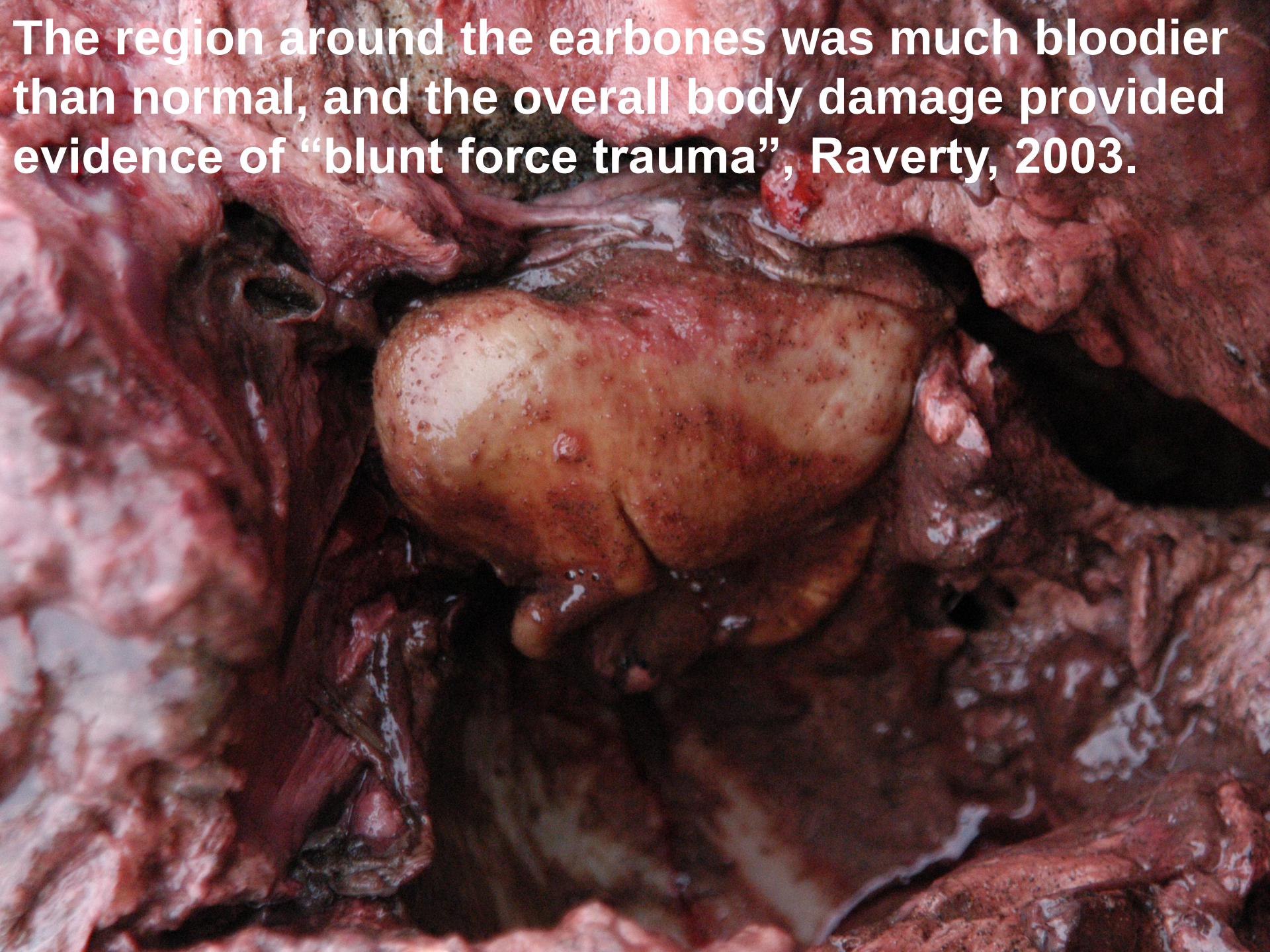
The eyes indicated probable cranial hemorrhage, and the entire head was frozen and shipped to Dr. Ted Cranford for CT scanning.



The scanning was funded by the US Navy, but unfortunately was for anatomy, not pathology; see Cranford, et. al. 2008, The Anatomical Record

A Baird's beaked whale washed in at La Push 29 January 2003

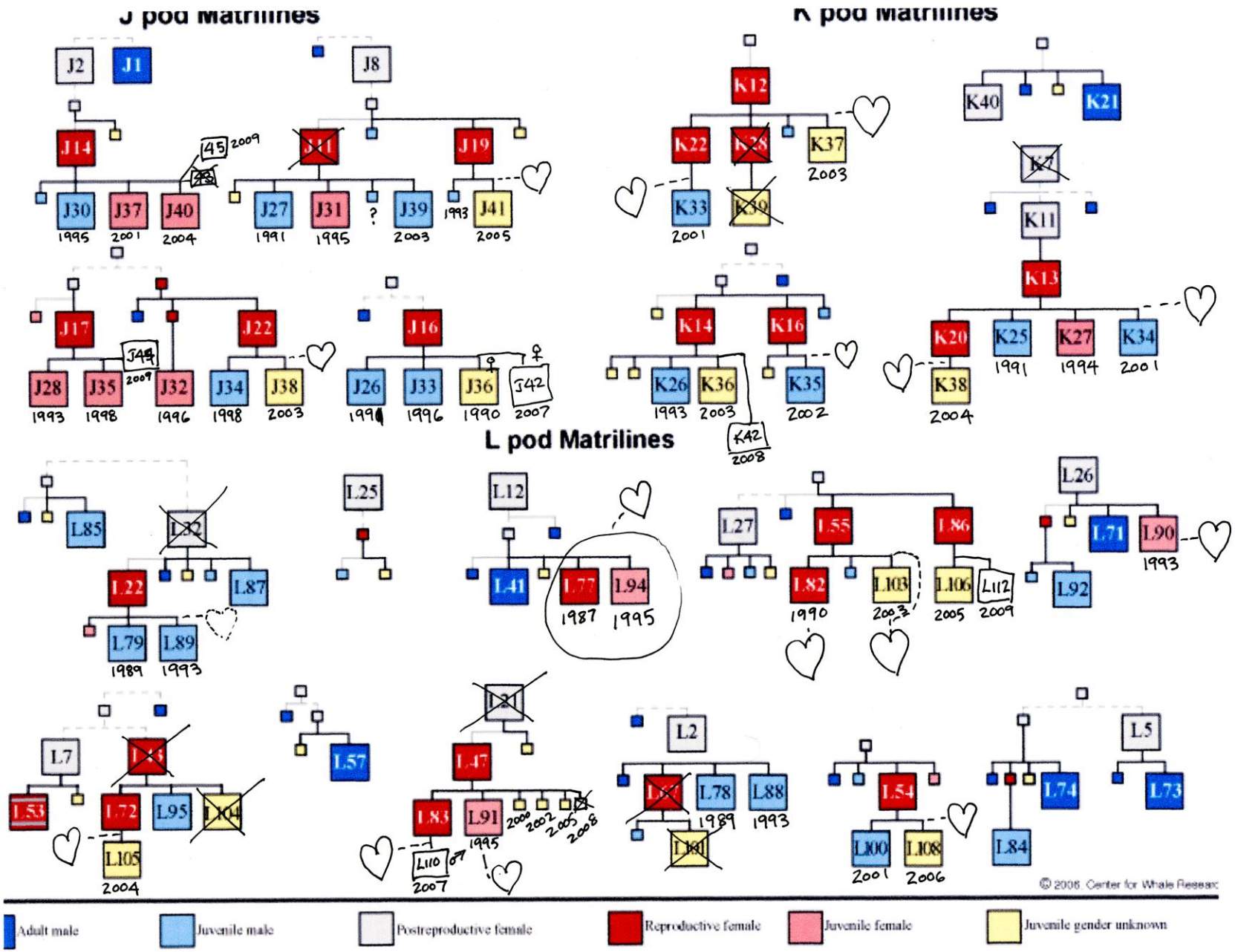
I dissected out the earbones on January 31
and provided them to NMFS for analysis.


The region around the earbones was much bloodier than normal, and the overall body damage provided evidence of “blunt force trauma”, Raverty, 2003.

Now, L112 11 February 2012

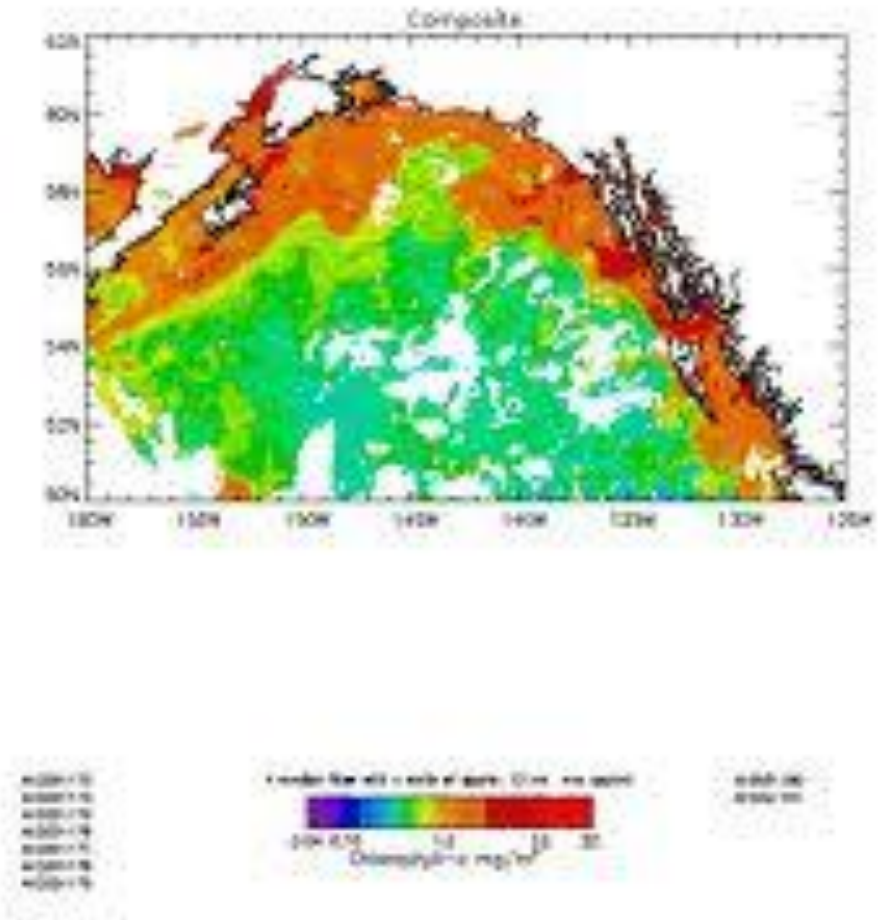
L112 Necropsy 6-7
March 2012

The End



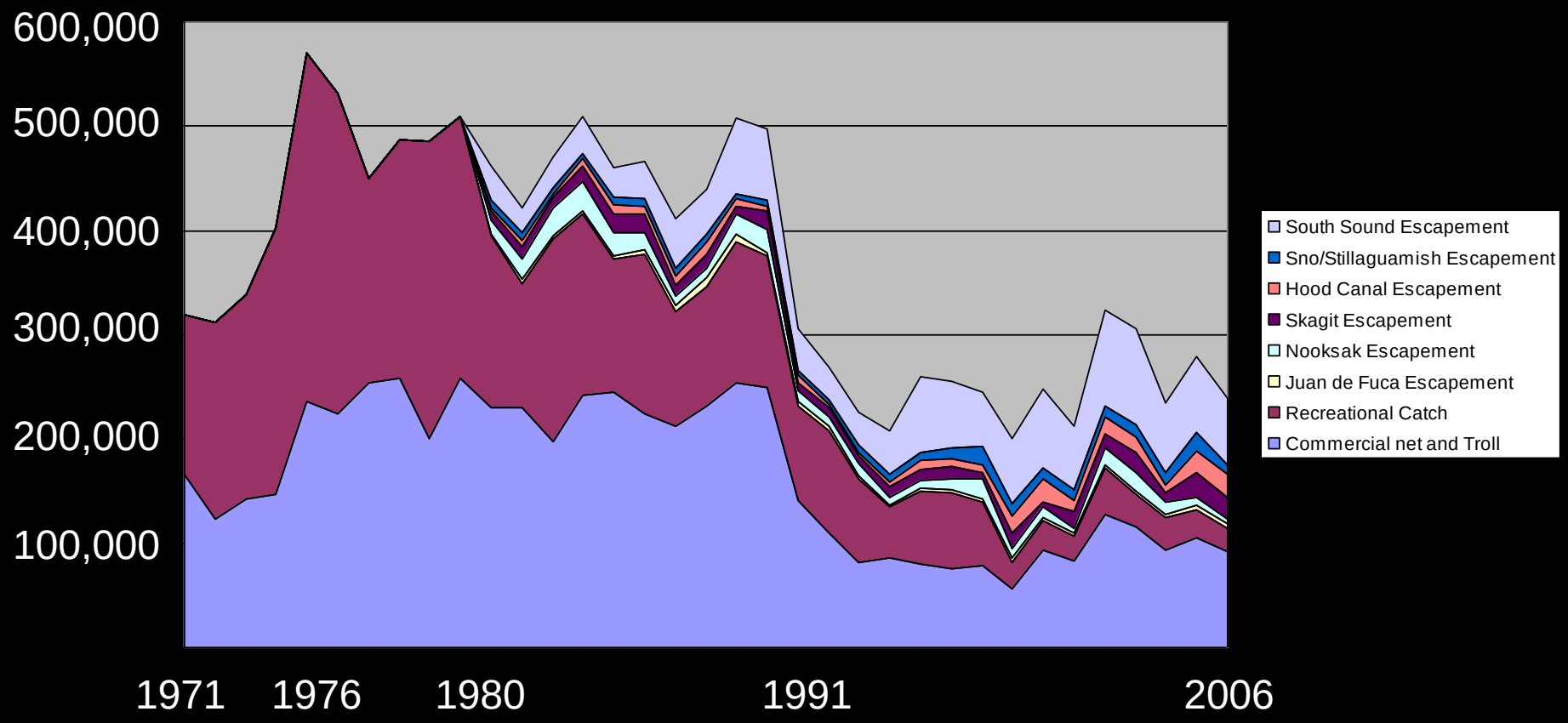
Draft Update for 2009 and potential prognosis (hearts) for remainder of 2009 and 2010.
We could see up to 15 or 16 new calves in next 24 months, of which maybe 9 survive.

Where have the fish gone?


Composite

Puget Sound Chinook Populations

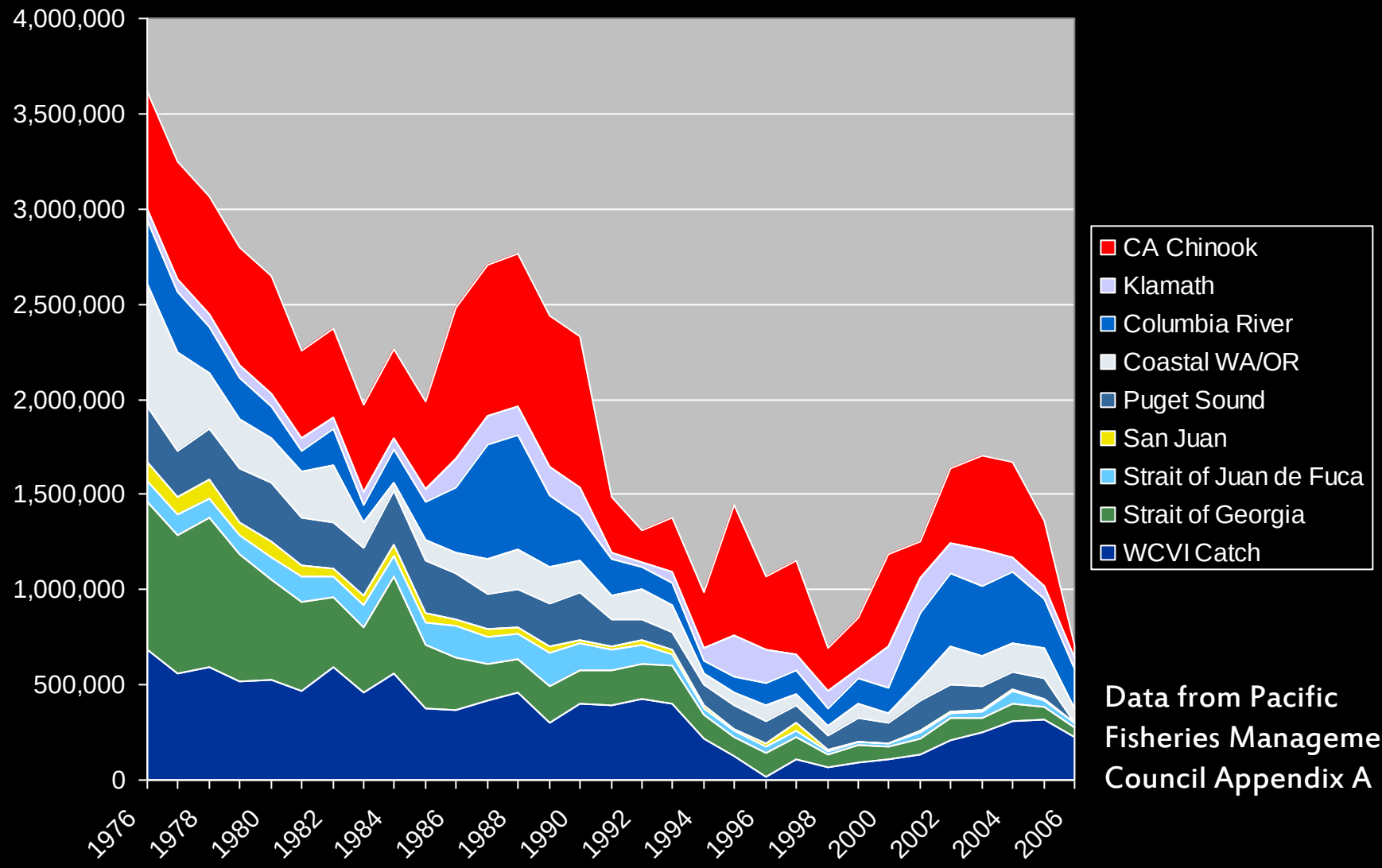
Data from Pacific Fisheries Management Council



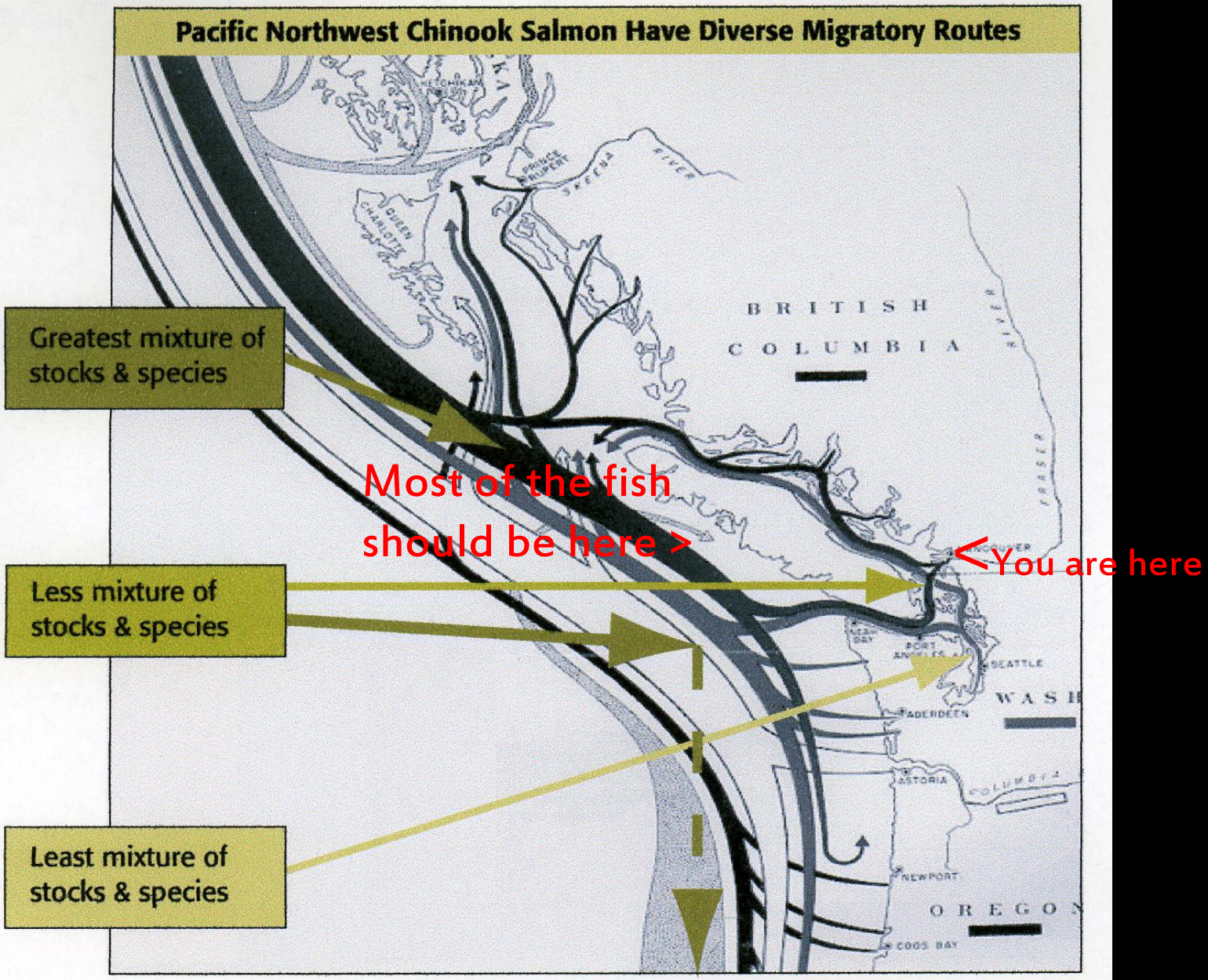
Graphic summary by K.C. Balcomb

Virtually all of the Puget Sound natural Chinook runs are a fraction of their former abundance. Of 31 historical populations, nine are Extinct!

Chinook Harvest 1976-2006

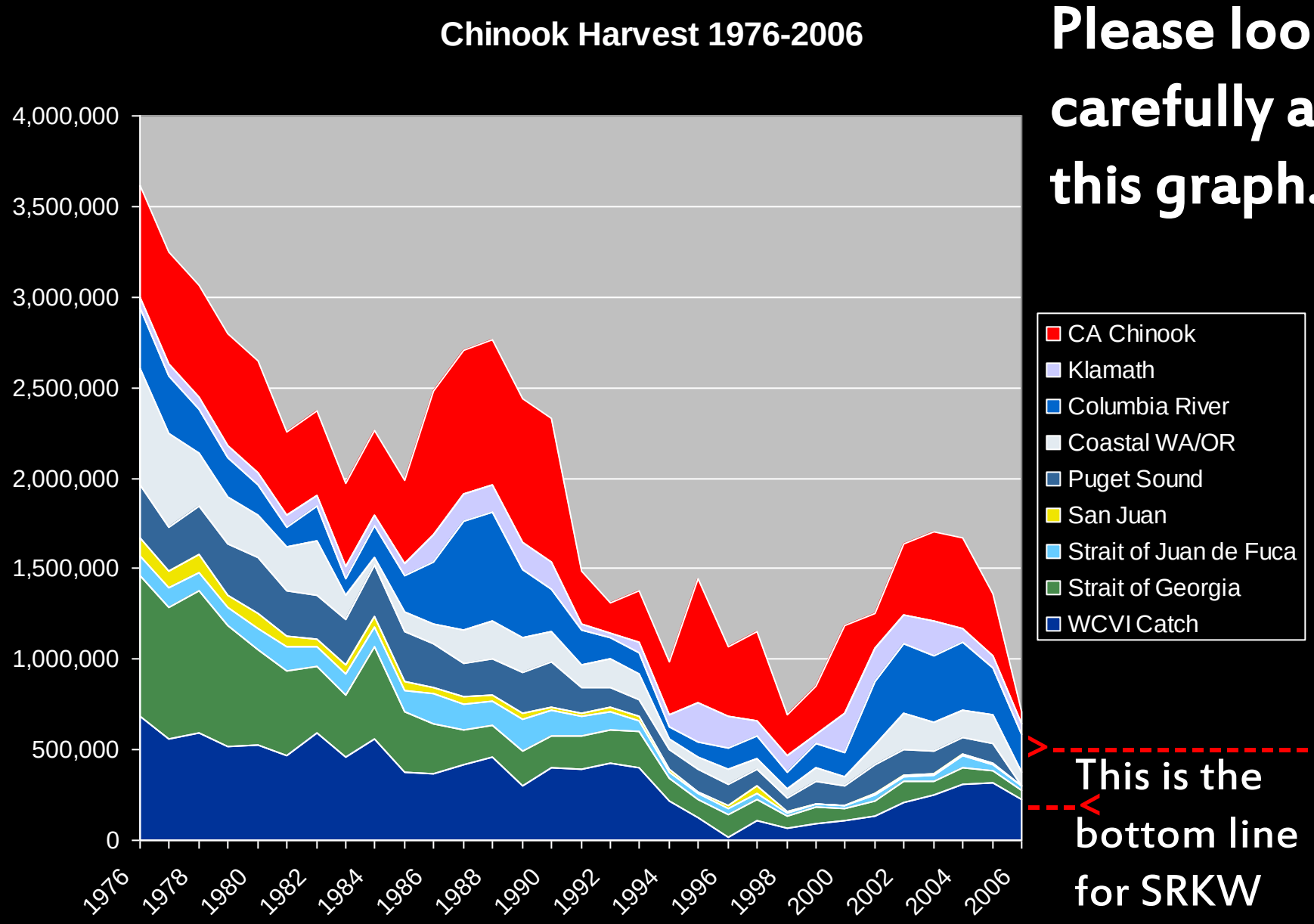


Data from Pacific Fisheries Management Council Appendix A



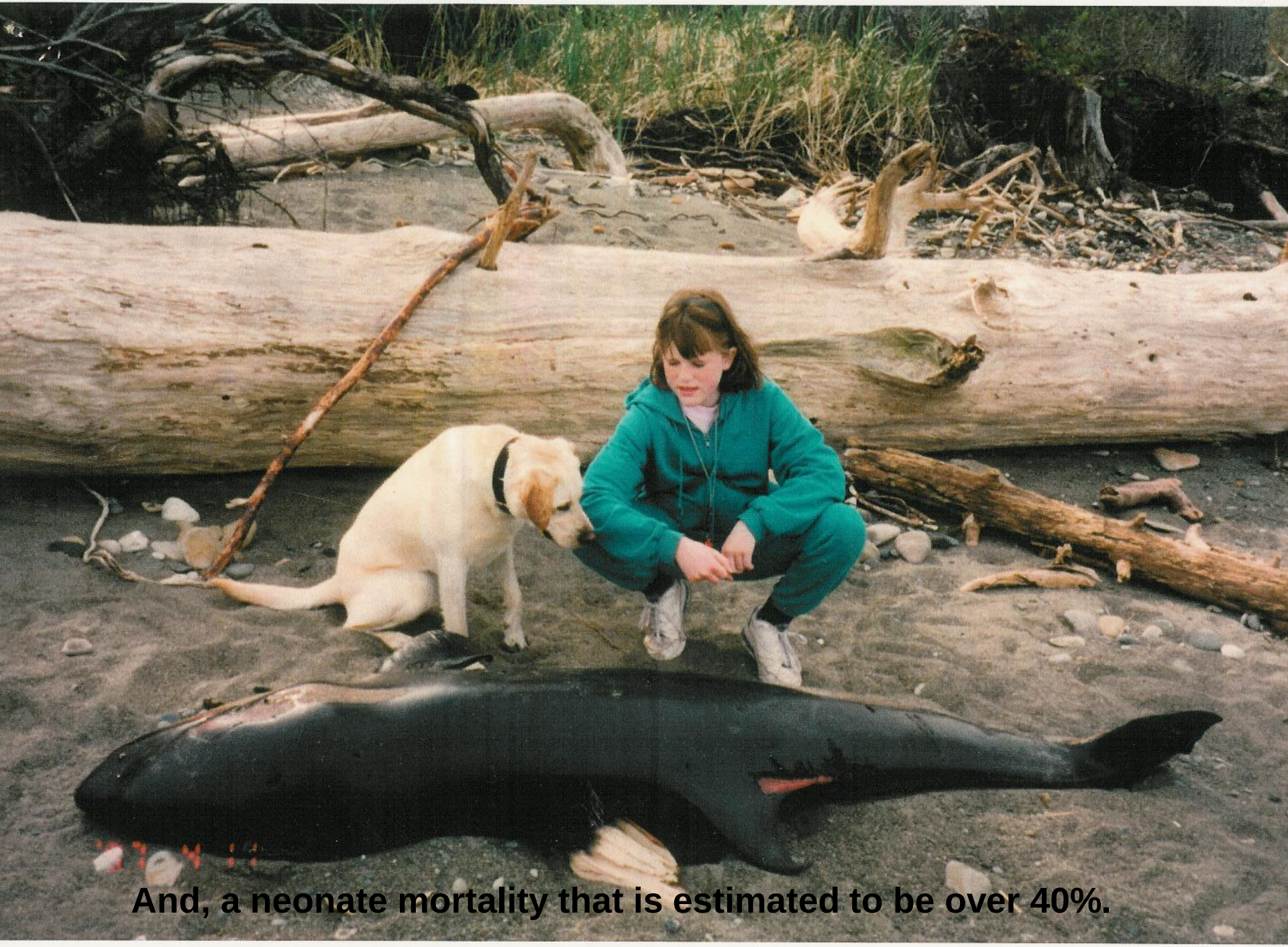
Simplified map of Chinook migratory routes (stolen from a book)

More than half of the stocks of Chinook salmon are now Extinct or Endangered by human activity.

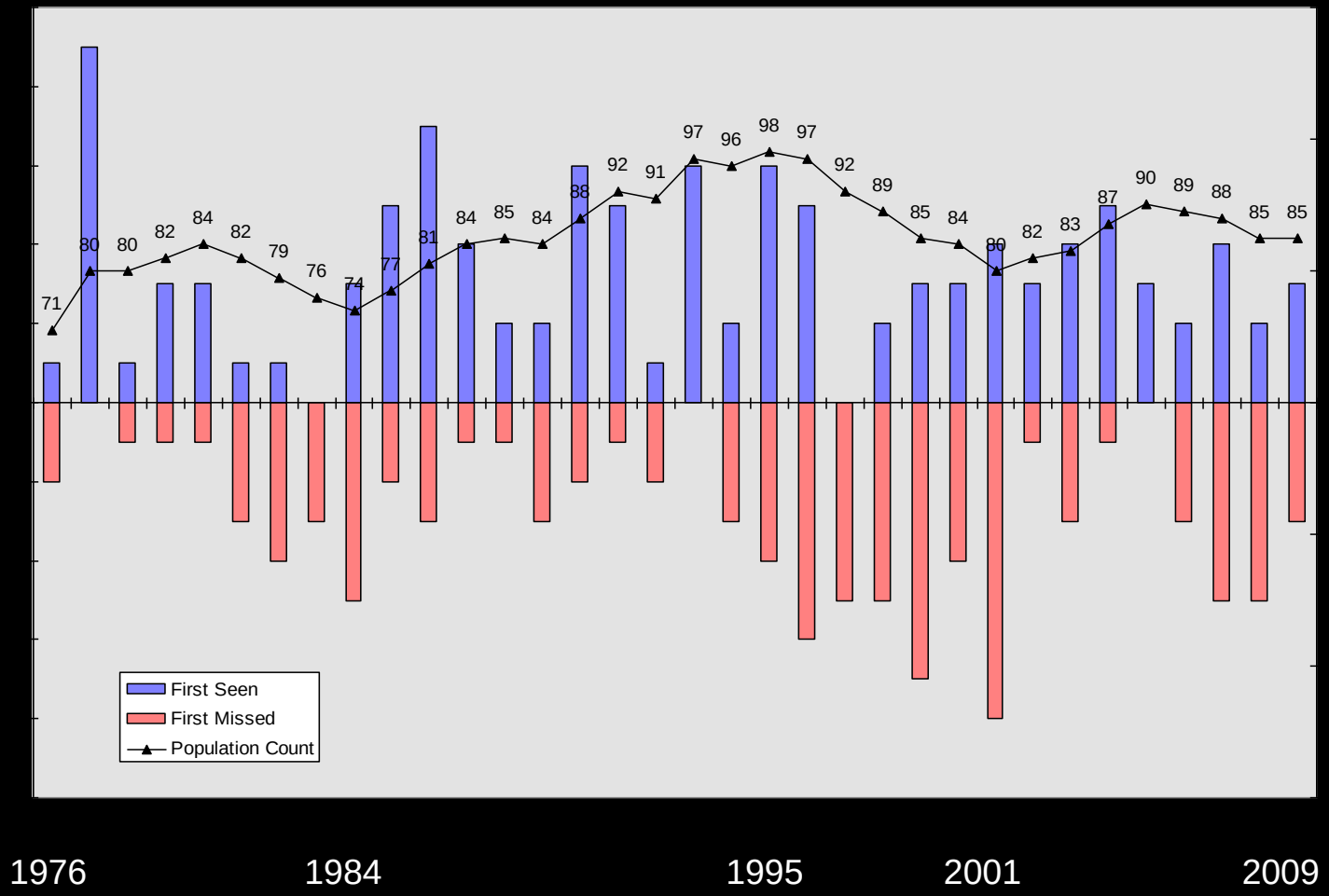


Please look carefully at this graph.

This is the bottom line for SRKW survival!

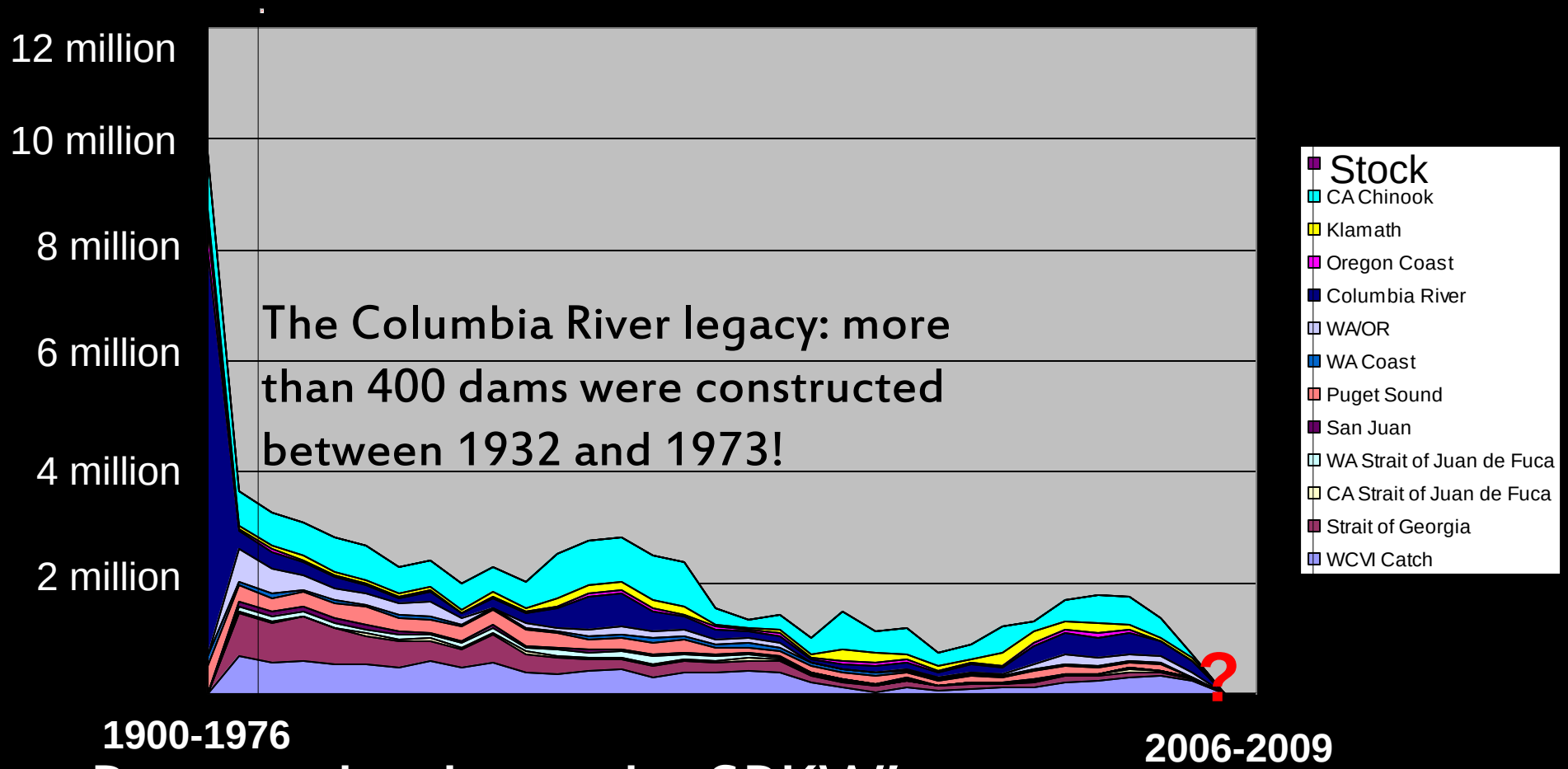


And, a neonate mortality that is estimated to be over 40%.



This is the SRKW population graph since 1976.

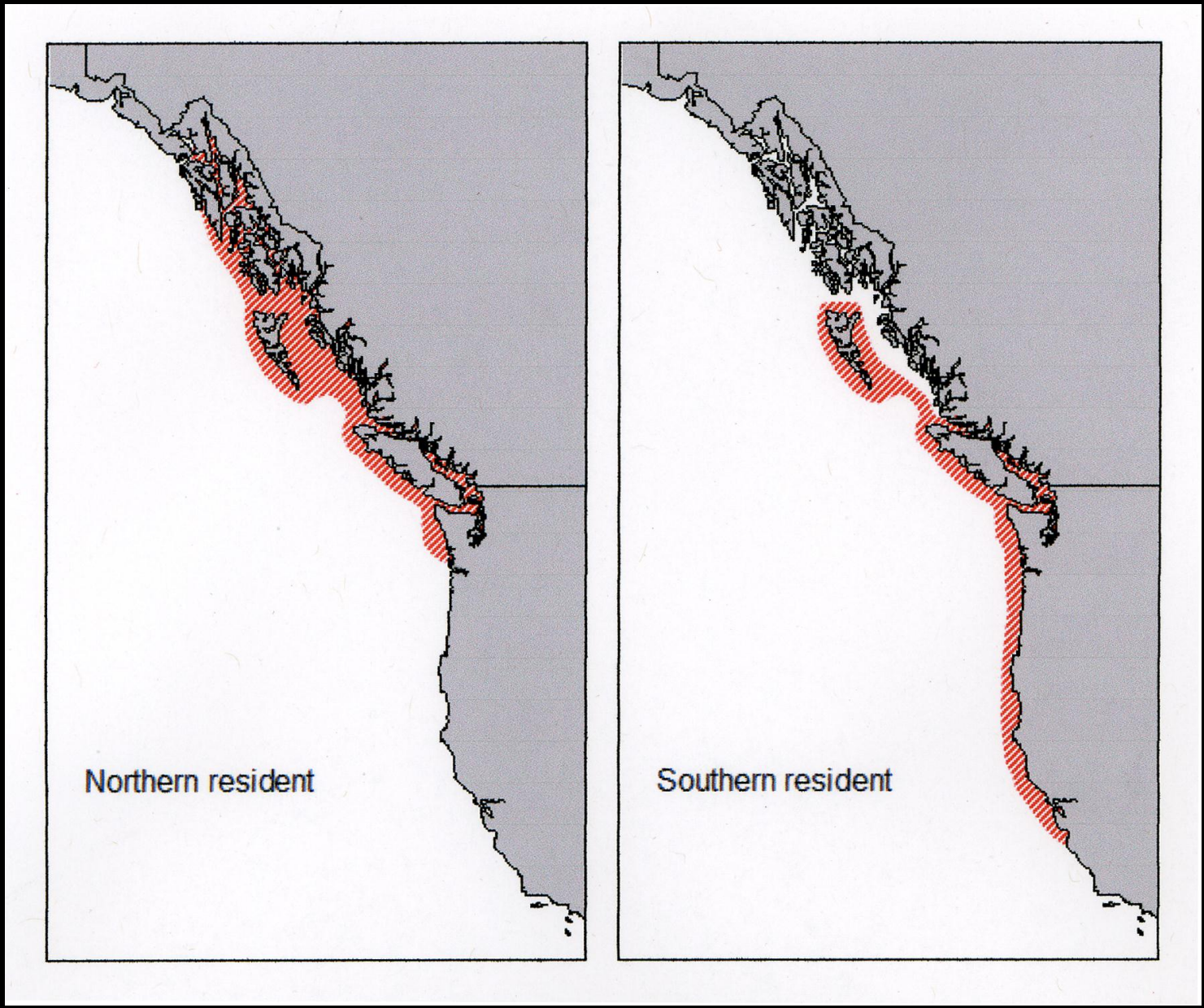
California to British Columbia Chinook Harvest 1900-2006



Prior to the dams, the SRKW's were more numerous, but they came through a "bottleneck".!

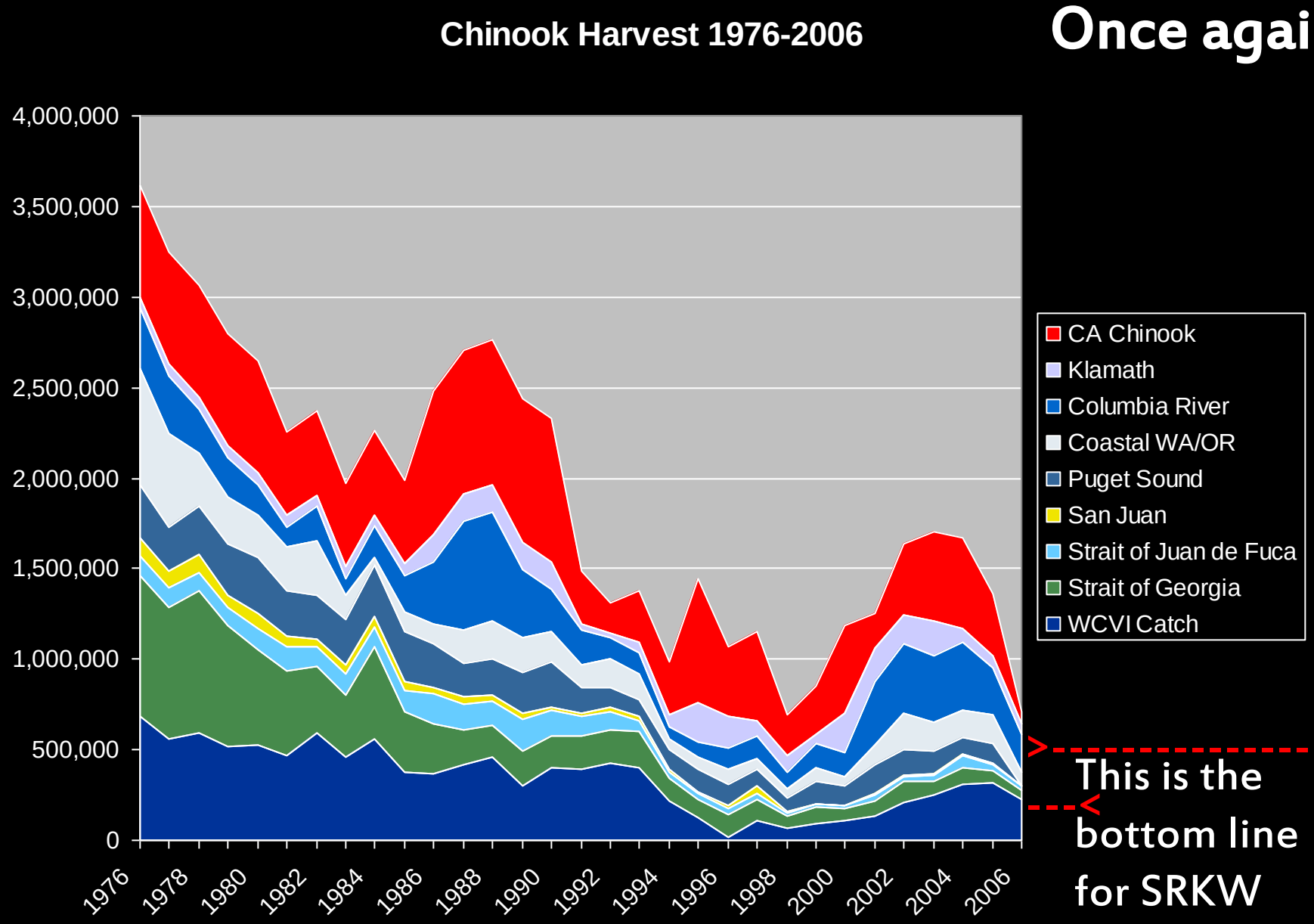
한진 베르린
HANJIN BERLIN

Pacific Ocean
Queen Charlotte Strait
Calgary
Vancouver Island
Vancouver
Kootenay River
030
028
035
Washington
042
Portland
043
Oregon
Idaho
Pacific Ocean
074
Great Salt Lake
Nevada
Utah
096
097
Francisco
Pacific Ocean
104
Fresno
California
Las Vegas
200 mi



Our foraging range is large and critical to us.

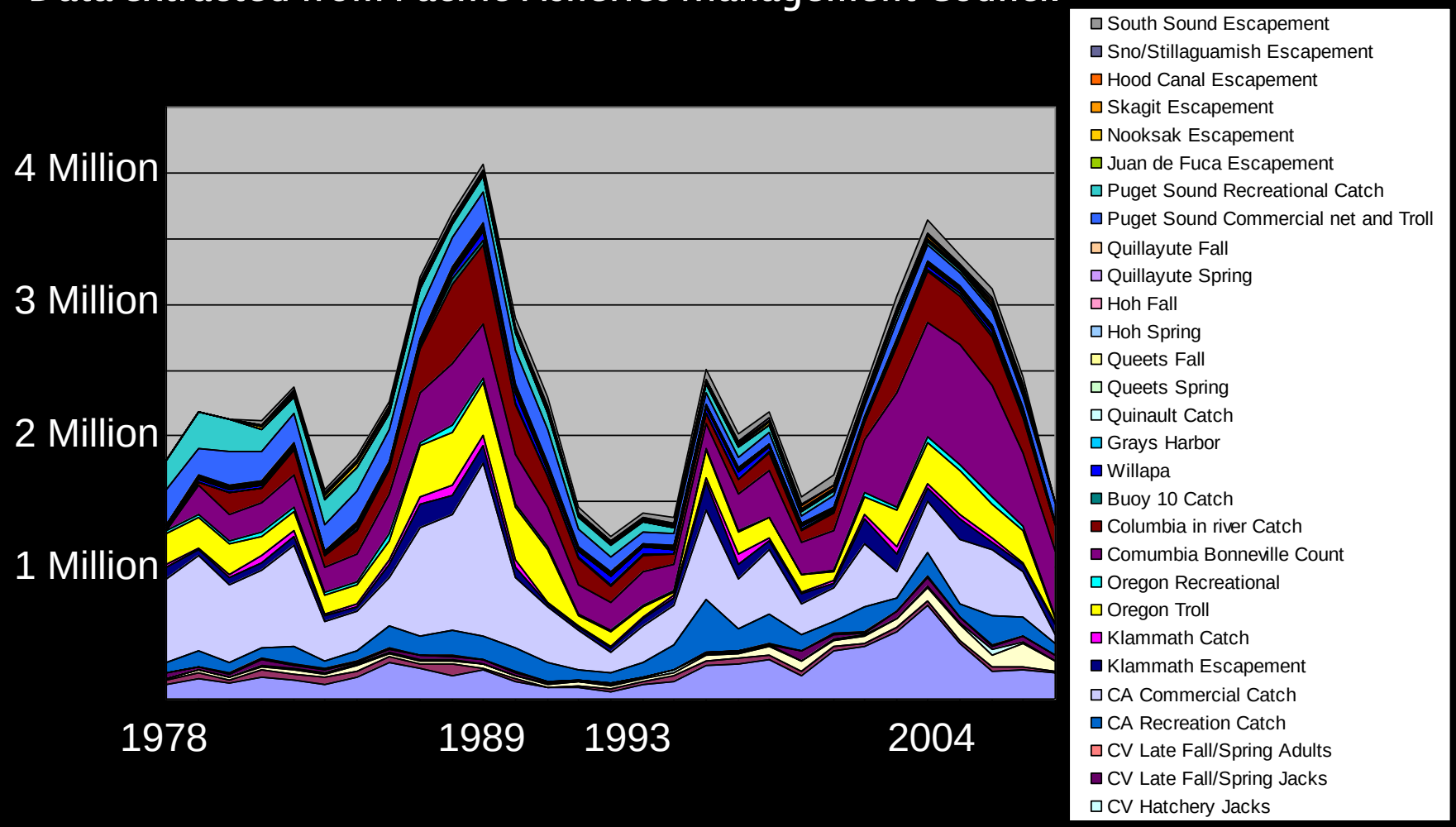
Once again,



This is the bottom line for SRKW survival!

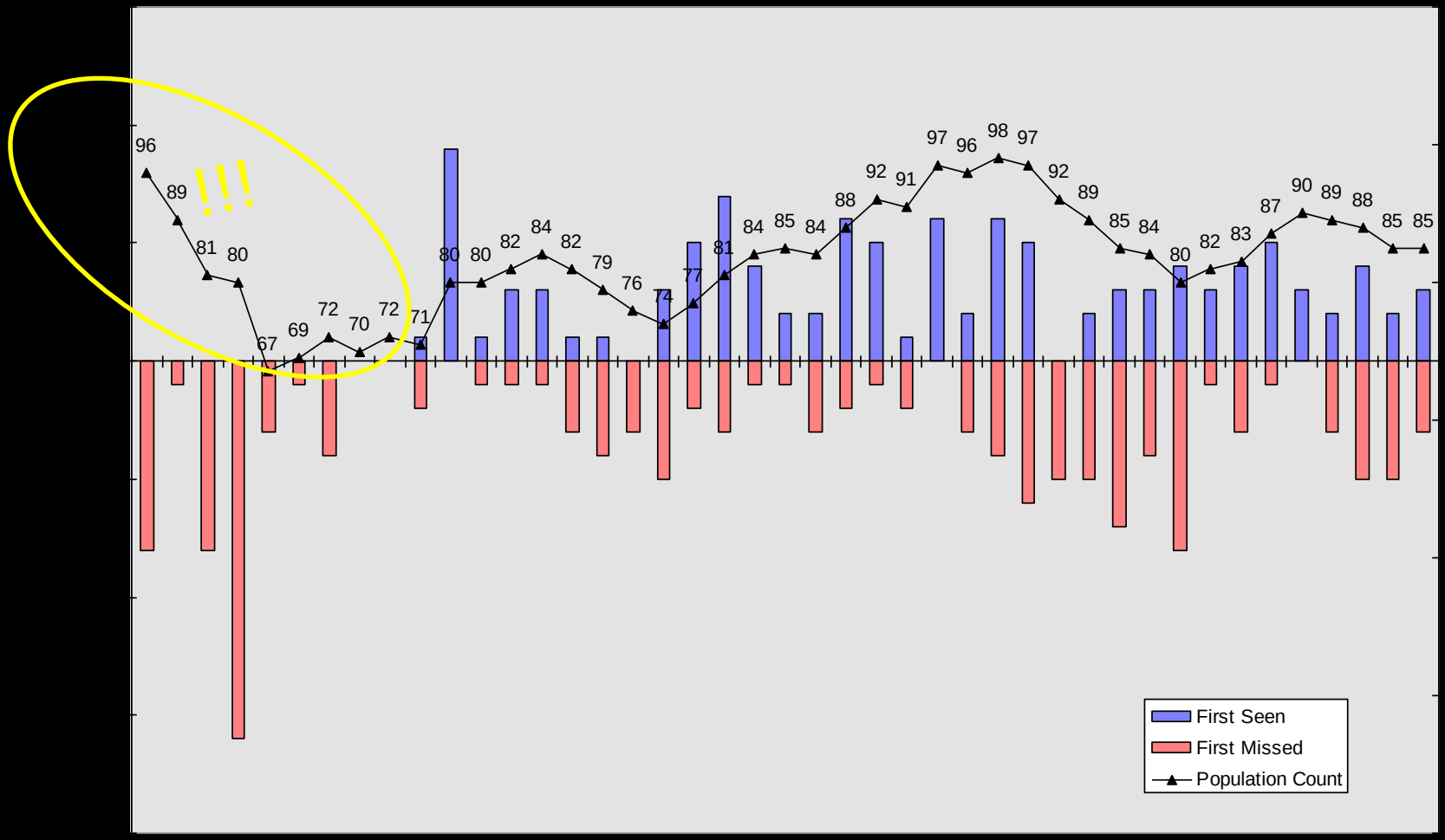
Recent Coastwide US Chinook population trends

Data extracted from Pacific Fisheries Management Council



Total population graphic summary by K.C. Balcomb

Off Newport, Oregon



Our population was over 100 before captures began in the 1960's.