

PROJECT CROOS

Collaborative Research on Oregon Ocean Salmon

www.PacificFishTrax.org & www.projectCROOS.com

Genetic Stock Identification Project Summary *(as of January 10, 2010)*

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Project CROOS applies genetic stock identification techniques to study the at-sea distribution and migratory timing patterns of Chinook salmon stocks encountered off the coast of Oregon. Fish harvest locations and fishing effort data are collected at precise spatial and temporal scales. Stock composition in mixed-stock fishery samples and assignment of individuals to specific regions or rivers are estimated by applying the Genetic Analysis of Pacific Salmonids (GAPS) standardized microsatellite baseline¹. These results can be used by fisheries managers to guide decisions aimed at reducing harvest of stocks of concern. In partnership with Oceanography researchers at Oregon State University, individual stock of origin estimates are being coupled with physical oceanographic conditions to investigate factors that contribute to Chinook distribution. Methods are being developed to determine if individual stocks are more closely associated with their river cohorts than with other stocks. Additional research includes the genetic basis of migratory timing and navigation of adult Chinook salmon. More information on genetic research can be found at <http://marineresearch.oregonstate.edu/genetics/index.htm>

Progress

- ⇒ Over 8000 Chinook salmon samples have been collected with accompanying fine-scale distribution data. Of these, over 7,200 were genotyped (2006-2007) and analyzed.
- ⇒ Other collaborative projects include: NOAA Northwest Fishery Science Center research cruises (2008); dock-side sampling and genotyping Chinook salmon harvested in the Cape Falcon, OR to Leadbetter Point, WA commercial and recreational fisheries with Oregon Department of Fish and Wildlife, Washington Department of Fish and Wildlife, and the Columbia River Inter-Tribal Fish Commission (2008); analysis of Chinook salmon incidentally caught in the Pacific Whiting fishery (2008 and ongoing 2009).
- ⇒ Due to the complete closure of commercial troll Chinook fishery south of Cape Falcon, Oregon, there was no at-sea data collection in 2008 or 2009, however data collection will resume in 2010 if the season permits.

Results to Date

- ⇒ Stock of origin estimates were provided within 24 - 48 hours of receipt by laboratory.
- ⇒ Harvest location, fishing effort, and genetic mixed stock analysis results indicate stock composition and distribution varies substantially over space and time.
- ⇒ Genotypes will be made available to the fisheries management community through the www.pacificfishtrax.org, an interactive, “real time”, and “market driven” website for fishery managers, scientists, fishermen, consumers, marketers, educators, and the public.
- ⇒ A detailed report on genetic findings by Project CROOS for years 2006-2007 can be found at <http://www.pacificfishtrax.org/about-us/reports-and-publications>.
- ⇒ A report on Chinook salmon incidentally caught in the Hake fishery is available on Pacific Fish Trax website.

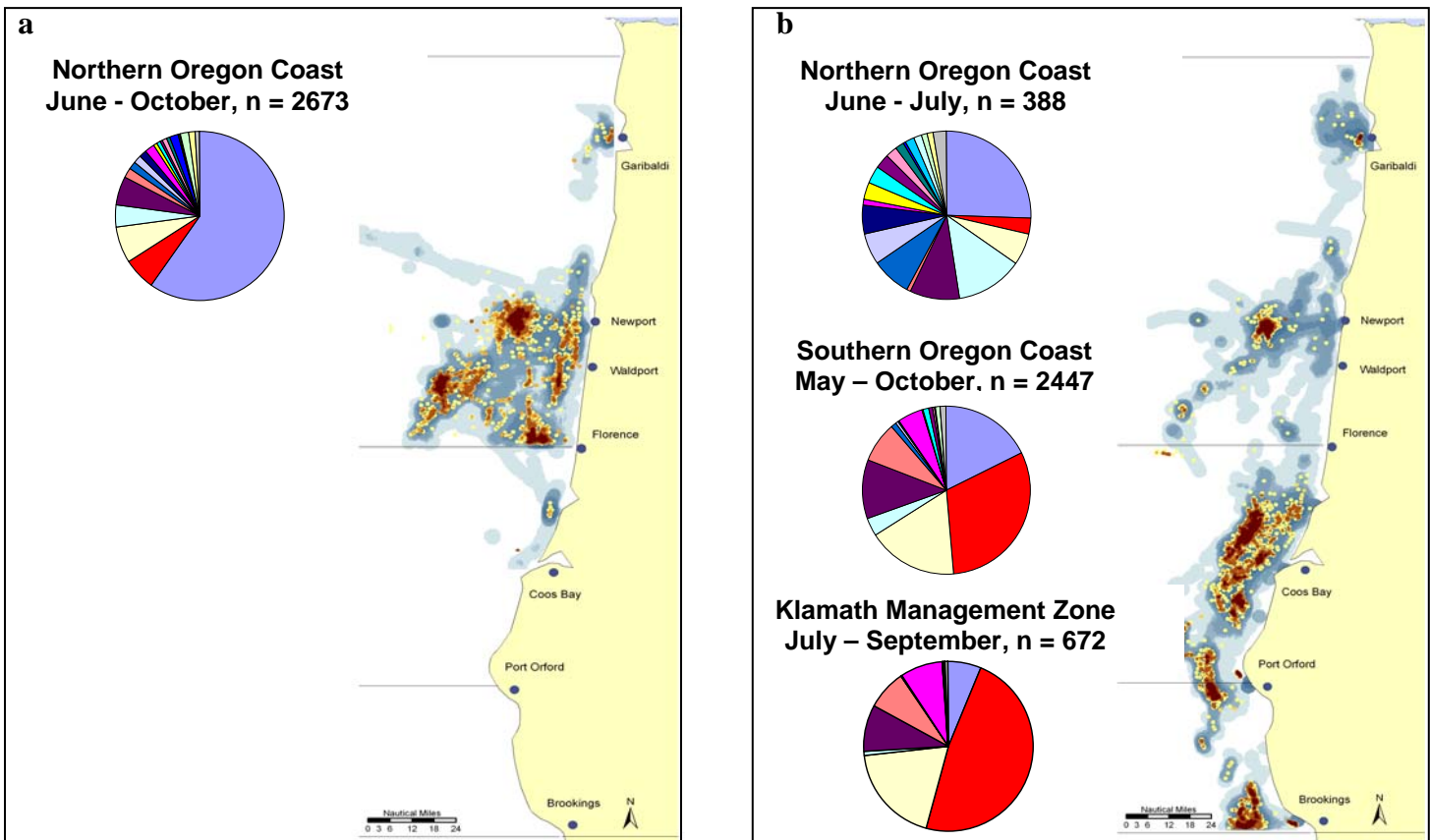
Future Actions

Project CROOS will resume at-sea research upon receipt of allocation of fish to fisheries research, during closed times, by the Pacific Fisheries Management Council or during an open Chinook salmon fishery. Meanwhile, the field of genetic stock identification progresses through development of a new baseline utilizing a new class of markers, SNPs (single-nucleotide polymorphisms) aimed at improving throughput and reducing costs for

¹ Primary funding for the GAPS baseline was provided by the U.S. Department of Commerce, NOAA, NMFS, funds appropriated to the U.S. section of the Pacific Salmon Treaty. We thank the GAPS consortium for valuable guidance and advice, and for collaboration on sample sharing and baseline construction.

genetic analysis. Funds are being pursued to SNP-type baseline populations in Oregon. SNP-typing is currently being accomplished by other GAPS laboratories coast-wide.

Figure 1. Fishing effort and fish harvest locations plotted as density for sampling conducted during the 2006 (a) and 2007 (b) CROOS commercial troll fishing season. Yearly stock compositions were calculated using the average of all monthly stock mixture proportions estimated with GAPS baseline v 2.1 and program ONCOR (Kalinowski, <http://www.montana.edu/kalinowski/Software/ONCOR.htm>). Stocks that contributed to a minimum of 1% in any mixture in any fisheries management zone are shown in the key below.



Stock Key

- | | |
|--|---|
| <ul style="list-style-type: none"> Central Valley fall (fsp) Klamath R. Rogue R. U Columbia R. su/fall Mid Oregon Coast N California/S Oregon Mid Columbia R. tule L Columbia R. fall S Puget Sound California Coast | <ul style="list-style-type: none"> L Columbia R. sp Deschutes R. fall Snake R. fa N Puget Sound Hood Canal Central Valley spring Mid Fraser R. S Thompson R. N Oregon Coast L Fraser R. Stocks <1% |
|--|---|

Vessel effort

- high
- ↑
- low

Fish Harvest Rates

- high
- ↑
- low