Human-mediated evolution in Chinook salmon

Human activities along the Snake River have brought on environmental changes, leading to the alteration of juvenile life history strategies by Snake River Fall-run Chinook salmon. The salmon are now smolting as yearlings rather than subyearlings in larger proportions. However, it is unknown if this change in life history strategy is associated with genetics. In order to assess the heritability of this life history change, Waples et al. used juvenile growth and migration rates, genetic information, and life history modeling of Chinook salmon. Results suggest that altered juvenile life history traits could be partially explained by evolution. This has important implications for management as maintaining genetic diversity of run timing within the population is important to ensure that it can respond to environmental change.

Photo courtesy of NWFSC

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Shipping noise poses risk to baleen whales

Redfern et al. used shipping traffic data to estimate noise levels in waters off Southern California. They found multiple areas where elevated low-frequency noise overlapped with important blue, fin, and humpback whale feeding grounds and other areas expected to have higher whale densities. They also found that the Channel Islands National Marine Sanctuary contained noisy and quieter areas. Although the Sanctuary does not regulate noise, the quieter areas occur in designated ship avoidance zones that help reduce risks of grounding and pollution. This designation demonstrates that there may be effective strategies to mitigate the risks of noise to marine species. This research provides a framework that can be used to evaluate how shipping traffic affects acoustic environments and a tool to explore existing and future management strategies. Read a press release about this article here.

Photo courtesy of NOAA, Jessica Morten

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Marine mammal predation on Chinook salmon

Predator-prey interactions are important controls on the size of animal populations, and these interactions between recovering species pose a conservation challenge. The recovery success of three protected pinniped species (California and stellar sea lions and harbor seals) and killer whales could be inhibiting the recovery of Chinook salmon in the Puget Sound due to predation. Using diet and bioenergetics models, Chasco et al. suggest that much of the Chinook mortality associated with predation occurs at early life stages and that there has been a significant increase in the consumption of Chinook salmon by pinnipeds from 1970 to 2015 (68 to 625 metric tons).

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Habitat shift in juvenile life stage of loggerheads

For loggerhead sea turtles, there is a limited understanding of how habitat use changes with life stage, which is necessary for the assessment of population trends and life history strategies for highly migratory species. Skeletochronology and stable nitrogen isotope (δ15N) patterns were used to assess habitat use of juvenile loggerhead sea turtles. Turner Tomaszewicz et al. found that juveniles did use different habitats (oceanic central North Pacific vs. neritic east Pacific) at different life stages. These two regions are highly variable with respect to food availability, energy requirements, and threats, which could affect life history parameters.

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This newsletter is intended to summarize the latest research on protected species from scientific publications that include one or more NOAA Fisheries authors. It will be distributed quarterly with alternate issues highlighting research from the East and West Coasts centers and offices.

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