Chapter 7: Floodplain Monitoring

Overview

Chinook Salmon

We reared juvenile Chinook salmon for two consecutive flood seasons within various habitats of the Cosumnes River and its floodplain (California) to compare growth rates of in river and newly created floodplain habitats. Fish were placed in enclosures in several different habitat types on the floodplain and in the river during times when wild salmon would naturally be rearing in floodplain habitats. We found significant differences in growth rates between salmon rearing in floodplain and river sites. Salmon reared in seasonally inundated habitats with annual terrestrial vegetation showed higher growth rates than those reared in a perennial pond on the floodplain. Growth of fish in the river upstream of the floodplain varied with flow and turbidity in the river. When flows and turbidity were high, there was little growth and high mortality, but when the flows were low and clear, the fish grew rapidly. Fish in tidal river habitat below the floodplain in showed very poor growth rates. Overall, ephemeral floodplain habitats supported higher growth rates for juvenile Chinook salmon than more permanent habitats in either the floodplain or river.

[Ephemeral floodplain habitats provide best growth conditions for juvenile Chinook salmon in a California river, Jeffres, C.A.](http://baydelta.ucdavis.edu/files/crg/reports/Jeffres_MS.pdf)

Native and Alien Fishes

Fishes were sampled on the restored floodplain of the Cosumnes River in Central California for seven years (1998-2002. 2004-2005) during the winter-spring flooding season. 33 species of fish were captured in the flood waters, the river, and an intersecting slough. 18 species were present all years in all three habitats. The fishes fell into five groups according to how they used the floodplain: (1) floodplain spawners, (2) river spawners, (3) floodplain foragers, (4) floodplain pond fishes, and (5) inadvertent users. Eight of the abundant species were natives, while the rest were aliens. There was a consistent pattern of floodplain use, although it was modified annually by the timing and extent of flooding. The first fish to appear on the floodplain were floodplain foragers, inadvertent users, and juvenile Chinook salmon (river spawners). The next fish to appear were adult floodplain spawners, principally Sacramento splittail and common carp, although small numbers of foragers and inadvertent users from were also present. Juvenile splittail and common carp quickly grew large enough to dominate floodplain fish samples, along with juvenile Sacramento sucker and pikeminnow (river spawners).

[Patterns in the use of a restored Califoria floodplain by native and alien fishes, Moyle, P.B., Crain, P.K., Witener, K.](http://baydelta.ucdavis.edu/files/crg/reports/MoyleFloodplainfishMS-26nov.pdf)

Documents

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* Moyle, P.B., R. D. Baxter, T. Sommer, T. C. Foin, and S. A. Matern. 2004. Biology and population dynamics of Sacramento Splittail (*Pogonichthys macrolepidotus*) in the San Francisco Estuary: a review. San Francisco Estuary and Watershed Science [online serial] 2(2):1-47.
* [A Geomorphic Monitoring and Adaptive Assessment Framework to Assess the Effect of Lowland Floodplain River Restoration on Channel–Floodplain Sediment Continuity Florsheim, J.L., Mount, J.F., Constantine, C.R. (River Research and Applications, 2006).](http://baydelta.ucdavis.edu/files/crg/reports/pubs/RRA.pdf)
* [The Geomorphic dynamics and environmental history of an upper deltaic floodplain tract in the Sacramento–San Joaquin Delta, California, USA, Brown, K.J., Pasternack, G.B.](http://baydelta.ucdavis.edu/files/crg/reports/floodplain_Brown2004.pdf)
* [Natural and anthropogenic geochemical signatures of ?oodplain and deltaic sedimentary strata, Sacramento–San Joaquin Delta, California, USA, Pasternack, G.B., Brown, K.J.](http://baydelta.ucdavis.edu/files/crg/reports/floodplain_Pasternack2005.pdf)
* A palaeoenvironmental reconstruction to aid in the restoration of floodplain and wetland habitat on an upper deltaic plain, California, USA, Brown and Pasternack (Environmental Conservation 2006)