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1991 SOCKEYE CULTURE WORKSHOP

ALASKA DEPARTMENT OF FISH & GAME
Division of Fisheries Rehabilitation, Enhancement, and Development*

*As of July 1, 1993, F.R.E.D. Division will be known as Commercial Fisheries Management & Development Division

Proceedings of the 1991 Alaska Sockeye Salmon Enhancement Meeting

Sitka, Alaska

24 and 25 October 1991

The Annual Alaska Sockeye Salmon Enhancement Meeting is an informal forum for the exchange of information about sockeye salmon enhancement. The Proceedings from this meeting are informal records and are not to be interpreted or quoted as a juried publication. In order to make the information as timely and useful as possible, presentations were sometimes made from original data and field notes while others were project updates using preliminary or incomplete data from ongoing work. The contents of these proceedings are a combination of materials provided by the speakers as well as narrative reconstructed from notes (in italics) taken by Katherine Aschaffenburg, Terry Ellison, and John Burke.

Sockeye Enhancement Meeting
Agenda

October 24; Sockeye Culture

8:00; Coffee

8:10; Welcome, Moderator, Terry Ellison

8:20; Keynote address, Robert Burkett

Yearling smolt production

8:40; Main Bay Hatchery update, John Burke

9:10; Pitt River Hatchery update, Dave Harding

9:30; Adult ripening at Main Bay Hatchery, Karen Robinette/Tony Carter

9:50; Yearling smolt and presmolt at Snettisham, John McNair

10:10; Break

10:25; Wenatchee River sockeye project update, Kathy Hopper/Mark Babiar

Underyearling Smolt

10:50; SSRAA underyearling smolt program update, Don Amend/Bill Halloran

11:20; Auke Creek underyearling smolt research update, Bill Heard/Jerry Taylor

11:40; Kodiak underyearling smolt programs, Lorne White/Steve Honnald

12:00; Lunch

Fry production

1:15; Snettisham CIF update (thermal tagging), Carol Coyle

1:40; In-Lake incubation of sockeye salmon adults at Redoubt Lake, Steve Reifenstuhl

2:00; New spawning containers for isolation and disinfection, Jeff Hetrick

2:20; U.V. Disinfection, Mike Blake

2:40; Break

3:00; Open forum on sockeye culture, Ken Roberson

Sockeye bioenhancement, rehabilitation, life history, and IHNV

8:00; Coffee

8:15; Introduction to Day 2, Terry Ellison

8:25; Snake River sockeye rehabilitation, Keith Johnson

8:55; Current status of Cedar River sockeye enhancement, Bob Gerke

9:25; IHN update for Alaska (Chenik Lake), Jill Follett

9:45; IHN, recent developments, overview, Ted Meyers

10:05; Break

10:20; Early marine life history of sockeye (Auke Bay), Joe Orsi

Case Histories

10:40; Hugh Smith Lake, enhancement and management, Doug Mecum/Phil Dougherty

11:00; Big Lake, sockeye coho interactions, Larry Peltz

11:25; Virginia Lake, fry plant timing and consequences, Mike Haddix

11:50; Esther Pass and Pass Lakes, fry and presmolt, Greg Carpenter

12:15; Lunch

1:30; Speel Lake, Ron Josephson/Scott Kelley

1:50; Sweetheart Lake, Rich Yanuze

2:10; Redoubt Lake, Don Dennerline

2:30; Break

2:45; Open forum, Ken Roberson

End of forum; Set next years meeting time and place, closing remarks, Terry Ellison

Rehabilitation of a Natural Sockeye Salmon Population Through Lake Enrichment, Redoubt Lake 1982-1991

by

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Historically, adult sockeye salmon escapement into Redoubt Lake exceeded 100,000 fish, but declined steadily over the last century. The initial decline is most likely the result of over harvest, with subsequent declines theoretically resulting from decreased nutrient inputs to the system through the reduction in the number of adult carcasses available for decomposition.

As a result of a feasibility study conducted in 1980, which revealed low numbers of zooplankters (781/m^3) and nutrient levels (total phosphorous <2.8 ug/l), Redoubt Lake was included in the ADF&G-FRED Division lake enrichment rehabilitation program. A detailed pre-enrichment study initiated in 1982 to assess the physical, chemical and biological production characteristics of the lake confirmed the results of the 1980 study. In 1984, applications of inorganic fertilizer were initiated to stimulate primary and secondary production, consequently increasing food available to lake rearing sockeye juveniles. Fertilizer was applied to the lake during 1984-1987, 1990 and 1991.

Mean smolt length increased significantly ($P<0.001$) after fertilization. Mean length of age I and age II smolts increased from 72.3 to 78.8 mm, and 76.3 to 103.3 mm respectively. Adult sockeye salmon escapement averaged 7,440 fish/year (N=7, range 442-13,581) for fish produced from years with no fertilizer added and 49,326 fish/year (N=3, range 29,945-72,781) for fish produced from years when fertilizer was added.

The empirical sockeye salmon production model developed for coastal Alaskan lakes, estimates that Redoubt Lake is capable of producing 325,000 adult sockeye annually. Observed smolt sizes and expected survival rates for various life stages, has allowed the reasonable prediction of the number of adults that will return. Returns exceeding 150,000 are expected in 1995 and 1996. Future studies planned at Redoubt Lake to relate in-lake and marine survival rates with limnological parameters will provide information to refine the production model and evaluate the success of the enrichment project.