Estuaries 4:285 (1981)

1539

long-term study (initial funding for five years) will provide data to answer specific core questions: 1) patterns and control of primary production, 2) long-term population dynamics, 3) patterns and control of organic and inorganic constituents, and 4) influence of environmental disturbances. In addition, other investigators are encouraged to use these data in designing their own research projects which are relative to estuarine-marshland dynamics.

ABSTRACT UNAVAILABLE

Modeling Carbon and Nitrogen Movement Between Salt Marsh and Estuary

RICHARD G. WIEGERT
University of Georgia, Athens, GA

ALICE G. CHALMERS
University of Georgia Marine Institute, Sapelo Island, GA

COMPARISONS OF ANADROMOUS FISHES IN ESTUARIES

Convenor: Wesley J. Ebel

Invited Session

The Life History of Fall Run Juvenile Chinook Salmon, *Oncorhynchus tshawytscha*, in the Sacramento-San Joaquin Estuary of California

MARTIN A. KJELSON AND PAUL F. RAQUEL
U.S. Fish and Wildlife Service, Stockton, CA

FRANK W. FISHER
California Department of Fish and Game, Stockton, CA

Juvenile salmon studies emphasize the significance of estuarine rearing, analysis of water development project impacts, and identification of salmon water quality and flow needs. Young chinook utilize San Francisco Bay and the upper estuary (Delta) for both rearing and seaward migration. Trawl and seine surveys indicate that major recruitment of fry (30 to 50 mm) to the estuary begins in January with peak abundance in March. Coded wire nose tags, growth and feeding studies, and routine surveys document rearing between January and June. Growth rate ranges from 0.5 to 1.3 mm per day. Comparisons of estuarine and upstream growth rates are made through scale analysis. The timing and quantity of inflow to the Delta appears to determine the distribution and number of fry reared in the estuary and the survival of smolts. Peak migration of smolts (70 to 80 mm) occurs in May and June. Smolt migration rates range from 8 to 24 km per day. Major food items observed in juvenile chinook vary between the freshwater (cladocera, diptera) and saline (copepods, amphipods, fish larvae) portions of the estuary.

Juvenile Pacific Salmon in Estuaries: The Life Support System

M. C. HEALEY
Department of Fisheries and Oceans, Nanaimo, British Columbia, Canada

Three species of Pacific salmon (chum, chinook, and coho) spend significant time rearing in estuaries following their seaward migration. Chum are abundant in estuaries for two months in early spring, coho for two months in late spring, and chinook throughout the spring, summer, and autumn. The specific habitats occupied by each species vary with the size of the fish, the stage of the tide, and the time of year. Tidal creeks through marshes, the junction of major and minor distributaries in the intertidal zone and the delta front are favored habitats. The diet of juvenile salmon in estuaries reflects a mixture of preference and availability, and the availability of food varies significantly between years and between estuaries. Major prey tend to be highly concentrated in the boundary layer at the mud-water interface, and many are detritus feeders, indicating that the food web leading to juvenile salmon is detritus based. The value of an estuary as rearing habitat for juvenile salmon appears to be influenced by delta configuration, especially the presence of marshes, tidal creeks and dendritic channels, and by the efficiency with which allochthonous organic carbon is trapped.

The Role of Puget Sound and Washington Coastal Estuaries in the Life History of Pacific Salmon: An Unappreciated Function

CHARLES A. SIMENSTAD
University of Washington, Seattle, WA

KURT L. FRESH
Washington State Department of Fisheries, Olympia, WA

ERNEST O. SALO
University of Washington, Seattle, WA

Washington State has a diversity of estuaries, ranging from the more classic types, characteristic of the coastal estuaries, to Puget Sound, a continuum of estuaries with transitional habitats. Five species of Pacific salmon utilize these estuaries to varying degrees; chum and chinook use them extensively while coho

Estuaries 4:285 (1981)

long-term study (initial funding for five years) will provide data to answer specific core questions: 1) patterns and control of primary production, 2) long-term population dynamics, 3) patterns and control of organic and inorganic constituents, and 4) influence of environmental disturbances. In addition, other investigators are encouraged to use these data in designing their own research projects which are relative to estuarine-marshland dynamics.

ABSTRACT UNAVAILABLE

Modeling Carbon and Nitrogen Movement Between Salt Marsh and Estuary

RICHARD G. WIEGERT
University of Georgia, Athens, GA

ALICE G. CHALMERS
University of Georgia Marine Institute, Sapelo Island, GA

COMPARISONS OF ANADROMOUS FISHES IN ESTUARIES

Convenor: Wesley J. Ebel

Invited Session

The Life History of Fall Run Juvenile Chinook Salmon, *Oncorhynchus tshawytscha,* in the Sacramento-San Joaquin Estuary of California

MARTIN A. KJELSON AND PAUL F. RAQUEL
U.S. Fish and Wildlife Service, Stockton, CA

FRANK W. FISHER
California Department of Fish and Game, Stockton, CA

Juvenile salmon studies emphasize the significance of estuarine rearing, analysis of water development project impacts, and identification of salmon water quality and flow needs. Young chinook utilize San Francisco Bay and the upper estuary (Delta) for both rearing and seaward migration. Trawl and seine surveys indicate that major recruitment of fry (30 to 50 mm) to the estuary begins in January with peak abundance in March. Coded wire nose tags, growth and feeding studies, and routine surveys document rearing between January and June. Growth rate ranges from 0.5 to 1.3 mm per day. Comparisons of estuarine and upstream growth rates are made through scale analysis. The timing and quantity of inflow to the Delta appears to determine the distribution and number of fry reared in the estuary and the survival of smolts. Peak migration of smolts (70 to 80 mm) occurs in May and June. Smolt migration rates range from 8 to 24 km per day. Major food items observed in juvenile chinook vary between the freshwater (cladocera, diptera) and saline (copepods, amphipods, fish larvae) portions of the estuary.

Juvenile Pacific Salmon in Estuaries: The Life Support System

M. C. HEALEY
Department of Fisheries and Oceans, Nanaimo, British Columbia, Canada

Three species of Pacific salmon (chum, chinook, and coho) spend significant time rearing in estuaries following their seaward migration. Chum are abundant in estuaries for two months in early spring, coho for two months in late spring, and chinook throughout the spring, summer, and autumn. The specific habitats occupied by each species vary with the size of the fish, the stage of the tide, and the time of year. Tidal creeks through marshes, the junction of major and minor distributaries in the intertidal zone and the delta front are favored habitats. The diet of juvenile salmon in estuaries reflects a mixture of preference and availability, and the availability of food varies significantly between years and between estuaries. Major prey tend to be highly concentrated in the boundary layer at the mud-water interface, and many are detritus feeders, indicating that the food web leading to juvenile salmon is detritus based. The value of an estuary as rearing habitat for juvenile salmon appears to be influenced by delta configuration, especially the presence of marshes, tidal creeks and dendritic channels, and by the efficiency with which allochthonous organic carbon is trapped.

The Role of Puget Sound and Washington Coastal Estuaries in the Life History of Pacific Salmon: An Unappreciated Function

CHARLES A. SIMENSTAD
University of Washington, Seattle, WA

KURT L. FRESH
Washington State Department of Fisheries, Olympia, WA

ERNEST O. SALO
University of Washington, Seattle, WA

Washington State has a diversity of estuaries, ranging from the more classic types, characteristic of the coastal estuaries, to Puget Sound, a continuum of estuaries with transitional habitats. Five species of Pacific salmon utilize these estuaries to varying degrees; chum and chinook use them extensively while coho