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STATE OF ALASKA
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REVISED ANADROMOUS STREAM CATALOG FOR SOUTHEASTERN ALASKA

By:
Paul Novak

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The primary purpose of these reports is presentation of data. Description of programs and data collection methods is included only to the extent required for interpretation of the data. Analysis is generally limited to that necessary for clarification of data collection methods and interpretation of the basic data. No attempt is made in these reports to present analysis of the data relative to its ultimate or intended use.

Data presented in these reports is intended to be final, however, some revisions may occasionally be necessary. Minor revisions will be made via errata sheets. Major revisions will be made in the form of revised reports.

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REVISED ANADROMOUS STREAM CATALOG FOR SOUTHEASTERN ALASKA[1/]

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ABSTRACT

Basic inventories of Southeastern Alaska watersheds provide valuable data pertinent to the concepts of resource management. A description of streams by maps, common names, historical records and geographical locations supports the standard numbering system. Physical and hydrological parameters are presented to support estimates of the rearing production capabilities of the streams. Land use activities and increased harvests on declining salmon stocks establish the need for basic stream inventories.

REVISED ANADROMOUS STREAM CATALOG FOR SOUTHEASTERN ALASKA

INTRODUCTION

Inventory of existing anadromous streams in Southeastern Alaska began in the early 1900's by interested fishermen and canneries. Since then, information has been collected and recorded by various state and federal agencies and institutions that cooperated in the management and research of the fishery resources, i.e., Fisheries Research Institute, University of Washington (FRI); Bureau of Commercial Fisheries (BCF), U.S. Fish and Wildlife Service (USF&WS), now the National Marine Fisheries Service (NMFS); U.S. Forest Service (USFS) and the Alaska Department of Fish and Game (ADF&G).

A cooperative effort began in the late 1950's to present a synopsis of stream inventory data in the form of stream catalogs for each regulatory district in Alaska. A series of catalogs were published jointly by the ADF&G and FRI. These catalogs presented stream descriptions, maps and historical salmon escapement data for more than 1,100 known spawning streams.

The increasing complexity of salmon management coupled with increased land use activities have demonstrated that the fishery biologist need update these stream inventories to establish a better data base. Therefore, in an attempt to provide this base, this project has been revised and additional observations that present physical parameters necessary to the identification of stream production potential have been added. In addition, this publication standardizes the numbering system, presents stream maps, peak salmon escapement data, geographical location by latitude and longitude and information useful to future surveys.

The structure for this updated stream catalog series for Southeastern Alaska consists of a general introduction that presents the format, rationale and procedures, and separate volumes grouped under the fifteen Regulatory Districts as an appendix to the general description. The appendix volumes will not necessarily be published in Regulatory District chronological order but will reflect the priority management needs for developing the data.

DATA SOURCES

ADF&G - Data on stream characteristics and historical salmon escapements is available in reports by research and management personnel.

FRI - The assembled stream catalog series by FRI and ADF&G (1963-1970) provided data on physical characteristics, escapement estimates and mapping. The basic format from this publication is continued here to supplement these past printed editions. Earlier works by FRI also appeared in 1949, 1950, 1951 and 1959 in the form of stream catalogs for Southeastern Alaska.

U.S. Department of Commerce - Anchorage sites when available were used from the publication "Pacific Coast Alaska, Dixon Entrance to Cape Spencer" U.S. Coast Pilot, Volume 8, 12th Edition, Jones (1969). Charters were used to locate the latitude-longitude coordinates of individual streams.

U.S. Geological Survey (USGS) - Geodetic mapping by this agency provided the basic source of measurements for stream lengths and topographical features distant from the stream. Extensive use of the maps was made during field activities.

USFS - Previous studies by this agency provided salmon escapements and habitat changes as a result of logging. Physical changes in the habitat are noted in the data.

USF&WS - Escapement data and district catalogs by this agency provided information to the present catalog. This information is again presented in the text of the revised catalog. The original numbering from USF&WS is the basis used in the stream catalog series publication and is again continued in the revised catalog.

U.S. Federal Power Commission - A cooperative publication between the USFS and this agency provides flow data and drainage characteristics for a few anadromous streams in District II.

Alaska Salmon Industry - Early surveys by individuals of the industry were incorporated into the stream catalog series publication and are again used.

Local Residents - Names of remote systems, anchorages, undocumented accounts of land use history and salmon escapements were provided by local residents.

CATALOG CRITERIA

Statistical Number - The primary identification of each stream is presented as the ADF&G statistical number. This is presented in chronological order. The first three digits represent the regulatory district with the next two digits representing the sub-district management area. The last two digits designate the stream number. In some cases it was necessary to apply a letter to new streams so that this numerical order could be retained from a statistical system developed in 1966.

Previous Numbering Systems

1) WR Numbers - Water resource stream numbers sometime appear below the statistical number. These numbers were originally presented in sequence but failed to present a system that could be expanded as new streams were inventoried. A number which includes a hyphenated number designates a tributary to the stream of the same number. A catalog number combining number and letters designates a minor stream, either adjacent to or between major streams numbered in sequence. For example, stream number 76A is a minor stream adjacent to a major stream, number 76.

2) K Numbers - The USF&WS originally cataloged anadromous streams in Alaska coastal areas. These numbers sometime appear as the third numerical identification system for a scattering of streams and are presented for identification of old stream records.

Work Area - Administrative districts are assigned to towns, designated under this heading. For example, all of Regulatory District II is managed by personnel from Ketchikan. In the Petersburg-Wrangell area some streams in a single regulatory district may be assigned to either one of these towns.

Stream Name - Recorded names or common local names are used when available. Descriptive names were commonly applied for unnamed watersheds. Duplication of names are retained due to local usage. Minor streams may have no names, therefore being identified by statistical number.

Latitude and Longitude - Location of streams is given by the use of "N" for north latitude and "W" for west longitude stated by degrees, minutes and seconds (or tenths of minutes). High tide points related to the stream are used when possible for point identification.

Geodetic Map Number - Photogrammetric presentation of aerial photographs are referenced for topographic reference. The district name precedes the map number. These maps are presented as 1" : mile.

Location - Designates the land mass for ease of reference. Example: Prince of Wales - Cholmondeley - West Arm.

Watershed Length - Watershed lengths were collected from geodetic maps using the K & E map measure.

Drainage Area - A polar planimeter was used to measure the area in square miles. Watersheds were outlined on geodetic maps for reliability of interpreting area.

Some watershed data was presented in the publication Water Powers of Southeastern Alaska, 1947.

Water Supply Type - Major water sources for the watershed are presented by estimated supply characteristics or from previous data presentation by numerous agencies.

Trails & Survey Routes - Local knowledge of the area by past surveyors and recorded accounts combined with information gathered during recent ground surveys will provide outstanding features for future surveys.

Aerial Survey Notes - The remarks by past surveyors on stream visibility due to valley topography, streamside vegetation and water coloration are considered for feasibility of aerial salmon surveying.

Anchorage - The U.S. Coast Pilot was utilized to describe anchorages associated with the streams. Where these ideas were not available a description of anchorages used during surveys is presented.

Tide Stage When Surveyed - To help identify intertidal areas of the stream, for mapping purposes, identification of spawning area and survey procedures, the stage of the tide during the survey is documented.

FISHERY RESOURCES

Commercial Fisheries - Under this heading all the known commercial species of salmon that utilize the stream for spawning or rearing are listed. In effect, the major salmon species that provide the majority of spawning in the stream

are listed first. This listing is based on observed escapement in all major streams and in many of the minor producers. Small streams without escapement history or observations were assigned species if the physical characteristics of the stream indicated probable utilization or nearby surveyed streams indicated species habitation.

Escapement Timing - The estimates provided in this section are based on individual historic stream escapements made by various agencies. Timing is based on systematic survey records, which include years of survey work before, near and after the peaks of abundance. Small streams without known escapement timing were classified according to other known stream timings in the close proximity. Previous department studies indicate the earliest runs of salmon occur along the colder mainland streams. The latest runs are in the outer channel and coastal areas where stream levels are dependent upon rainfall.

Intermediate timing of runs occurs in the region lying between the mainland and outer coastal areas. Therefore, 'early' designates peaks before August 15; 'middle' peaks between August 15 and September 15; 'late' peaks after September 15.

Estimated Optimum Escapement - Optimum escapement, as defined by Wright (1964), is the number of salmon which will most efficiently utilize the available spawning gravels in a particular system. Optimum escapement for pink salmon can be estimated for each stream from the available spawning area (M^2) assuming one female spawner for each square meter of area as the optimum density. Studies by Wright (1964) and Wickett (1958) indicated this optimum density value.

Foot or helicopter surveys provided data on channel length, width, and percentage of riffle area available on each stream.

Other considerations and methods of estimating optimum escapement are recognized, including analysis of escapement history of streams, spawner-recruitment curves, and spawner-fry production curves. Distribution of the spawners within the stream must also be considered.

Additional study will be necessary to further define escapement goals.

Species Composition - Further studies on the number of one species relative to the number of other species are needed in evaluating present stream production. Rehabilitation projects are in need of in-depth stream population dynamics to evaluate need and possible effects. Composition studies are more commonly applied to lake systems but because of annual inhabitation of various species of fish in Alaska streams, this aspect of study should apply to all aquatic habitats. In presenting data in this section, an estimate of population composition was made for salmon based on historic escapement surveys and inventory observations.

Shellfish Potential - Sources of data included commercial fishermen, local residents knowledge and surveys made by the inventory crew. Subsistence and commercial pots were used to identify presence of shellfish (crab and shrimp) and clam beds were noted in the associated intertidal zone if the survey time coincided with ebb tide situations. Local residents knowledge was used when available.

Sport Fisheries - Species included are known to be present from past agency surveys, local resident knowledge or observations during the survey. Included in the sport fisheries potential are the salmonid species that utilize these systems.

Land Use at Present - Any activities associated with man's present use or planned use was incorporated into this section. Logging, mining, roads, camp-sites, dumpsites and residential developments are commonly itemized. Sources of data on History of Land Use was collected from local residents and agency files.

Rehabilitation Potential - Barriers, windthrow, high erosion areas and potential fishery reclamation projects of the individual streams are noted. Future projects by the Division of Fisheries Rehabilitation, Enhancement and Development (FRED) of the ADF&G directly relate to information presented under this heading.

Soils - Data on each stream's soils characteristics are presented in this section. V-notched drainage areas, side sluffing and problems related to land use activities or planned activities are described. Complete soils classification for some of the watershed may be found at the USFS office.

GAME RESOURCES

A variety of wildlife sightings were made during the actual field surveys. Game observations are presented to demonstrate other natural resource values

that are commonly associated with the stream. A visual estimate of each inter-tidal area was made to help inventory waterfowl nesting and feeding grounds. In addition, this information provides data on shellfish habitat, useful in land use planning.

PEAK ESCAPEMENT

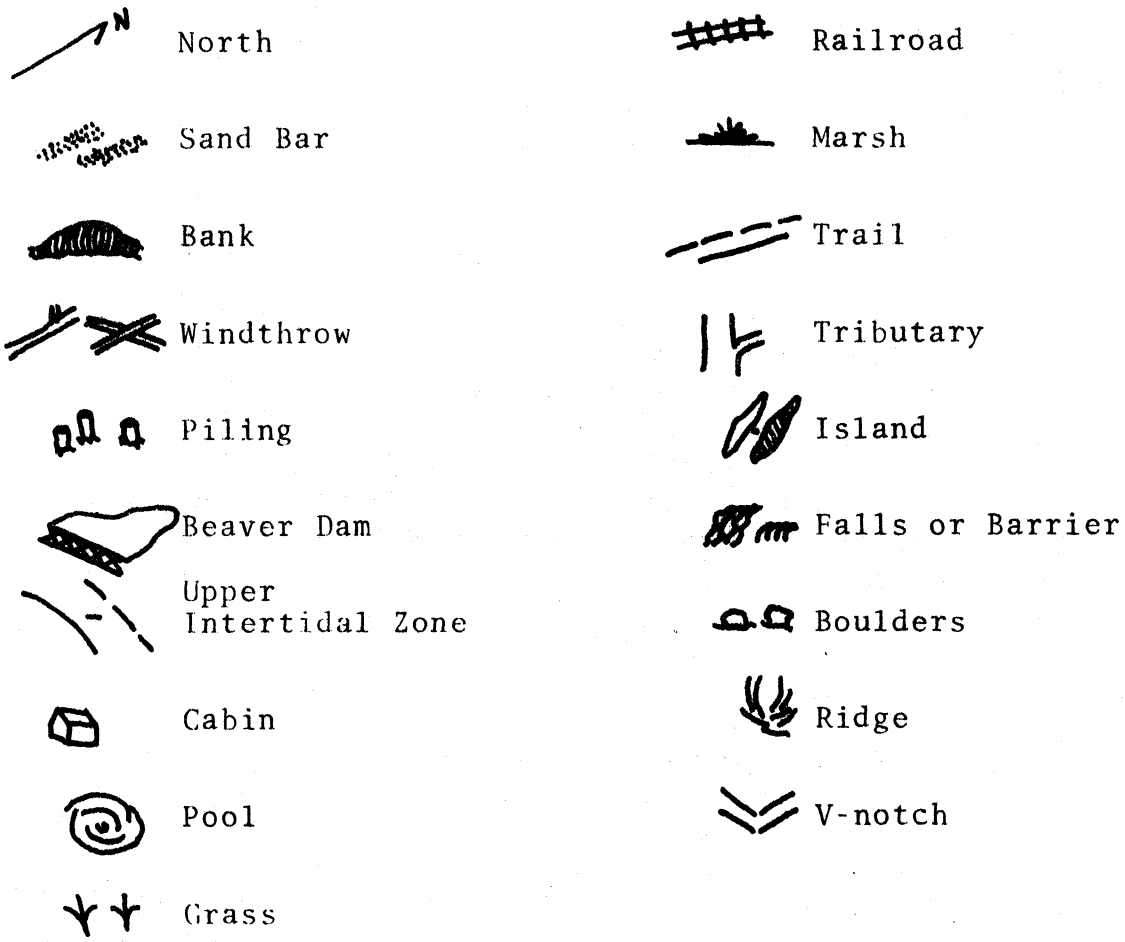
In order to have a short concise format in compiling escapement records, the peak escapement 1/ for each species is presented. Peak escapement consists of the highest single count of a given species during a year in each stream. Observations were conducted by three methods: (1) aerial or fixed-wing aircraft, (2) helicopter, (3) foot. The method used to determine the peak escapement is denoted under 'remarks' as an abbreviation; (A) aerial, (H) helicopter (F, G) foot surveys. Any other factors which would help in establishing an accurate count were also listed under 'remarks'. These consisted of visibility (vis.), number of fish schooled inter-tidally and presence of fish carcasses.

MAPS

In presenting the maps for each stream survey the reader should not interpret these as drawn to scale. A 1":63,360" scale map is located in the lower corner of the page and as indicated by 'X' shows the extent of ground survey efforts. '#' designates a station as entered on the stream inventory form. Pertinent features are either drawn or discussed as the maps indicate.

1/ A discussion of escapement index and total escapement versus peak escapement is presented in the 1972 Southeastern Alaska salmon forecast (Durley and Seibel, 1972).

MAP SYMBOLS



STREAM INVENTORY FORM

A set of standard basic stream information leading to a form of classification is needed for Alaskan streams. This information should be collected over several years on a continual updating basis. On completion of this objective, it will be apparent that certain parameters will describe stream productivity.

In order to classify streams according to individual parameters it was necessary to develop a numerical system that could be computer programmed

in the future. Therefore, each measure is presented by number. A key to this numerical system is available below and should provide better understanding to the individual stream inventories.

INVENTORY KEY

Volume
- 100' Unobstructed Section

Velocity
1. Sluggish - .5/sec. or less
2. Rapid - > .5/sec.
3. Torrential - Steep Gradient

Pool Size
1. Ave. L or W >ave. W of stream
2. W or L = Ave. W of stream
3. Narrower than ave. stream W

Pool Type
1. >2'
2. Depth, intermediate
3. Shallow, scouring

Pool-Riffle Frequency
1. 75% - 25% pool-riffle
2. 50% - 50% pool-riffle
3. 25% or less pools

Turbidity
1. Clear - >4'
2. Slight turbidity - 1'-4'
3. Turbid - <1'

Color
1. Colorless
2. Light brown
3. Dark brown

Bottom Type
1. Sand
2. Detritus
3. Silt
4. Gravel
5. Rubble
6. Bedrock

Higher Plants
1. Spruce >50%
   Hemlock <50%
2. Hemlock >50%
   Spruce <50%
3. Cedar >50%
   Other <50%
4. Other types (denote)

Aquatic Vegetation
1. Dense - every rock
2. Medium - 1/2 or the rocks
3. Sparse - seldom observed

TRIBUTARIES - #
STATION - #

FRY ABUNDANCE

(species seen - # seen)

1 - Coho
2 - Dolly Varden
3 - Cottidae
4 - Cutthroat
5 - Rainbow/Steelhead
6 - Pink
7 - Chum
8 - Unknown

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