

AFSC/ABL: Movements of Yukon River Chinook salmon

Theme keywords: Biota, 002, Chinook salmon, migration, spawning

Abstract: A radio telemetry study was conducted on Yukon River Chinook salmon (*Oncorhynchus tshawytscha*) during 2002-2004 to provide information on migration patterns. During 2002, 768 adult Chinook salmon returning to the basin to spawn were radio tagged in the lower Yukon River near the villages of Marshall and Russian Mission. Most (751, 97.8%) resumed upriver movements, with 270 fish harvested in fisheries and 481 fish tracked to upriver areas using remote tracking stations and aerial surveys. Movement rates for radio-tagged fish averaged 51 km/day. Middle and upper basin stocks traveling through reaches of the Yukon River main stem averaged 54-61 km/day, although slower swimming speeds were recorded as the fish approached their natal streams. Movement rates for lower basin stocks were substantially less, averaging from 31 km/day to 37 km/day, possibly due to the shorter distances traveled to reach their spawning areas. During 2003, 1,097 fish were radio tagged in the lower Yukon River near the village of Russian Mission during 2003. After tagging, most (1,081; 98.5%) fish resumed upriver movements, with 271 fish harvested in fisheries and 810 fish tracked to upriver areas using remote tracking stations and aerial surveys. Movement rates for radio-tagged fish averaged 50.9 km/day, although regional differences were observed. Middle and upper basin fish traveled an average of 48.0 km/day and 54.7 km/day, respectively. However, these stocks exhibited comparable movement rates in reaches of the Yukon River main stem, while slower swimming speeds were recorded as the fish approached their natal streams. Movement rates for lower basin stocks were substantially less, averaging 31.2 km/day, possibly due to the shorter distances traveled to reach their spawning areas. During 2004, 995 fish were radio tagged in the lower Yukon River near the village of Russian Mission during 2004. After tagging, most (958, 96.3%) fish resumed upriver movements, with 329 fish harvested in fisheries and 629 fish tracked to upriver areas using remote tracking stations and aerial surveys. Movement rates for radio-tagged fish averaged 51.8 km/day. Middle and upper basin stocks averaged 46.4 km/day and 55.1 km/day, respectively. However, these stocks exhibited comparable movement rates in reaches of the Yukon River main stem, while slower swimming speeds were recorded as the fish approached their natal streams. Movement rates for lower basin stocks were substantially less, averaging from 34.6 km/day, possibly due to the shorter distances traveled to reach their spawning areas. Understanding the movement patterns exhibited by Chinook salmon during their upriver migration can provide valuable insight into the biology, run dynamics, and management of Chinook salmon returns and their associated fisheries. The data collected during the 2002-2004 study is being analyzed to determine if the observed movements and associated factors within different reaches of the basin can be used to better understand and predict Chinook salmon migratory behavior.

FGDC, ESRI , and Biological Profile Metadata:

- [Identification Information](#)
- [Data Quality Information](#)
- [Entity and Attribute Information](#)
- [Distribution Information](#)

- [Metadata Reference Information](#)

Metadata elements shown with **blue** text are defined in the Federal Geographic Data Committee's (FGDC) [Content Standard for Digital Geospatial Metadata \(CSDGM\)](#). Elements shown with **green** text are defined in the [ESRI Profile of the CSDGM](#). Elements shown with **brown** text are defined in the [NBII Biological Profile of the CSDGM](#). Elements shown with a green asterisk (*) will be automatically updated by ArcCatalog. ArcCatalog adds hints indicating which FGDC elements are mandatory; these are shown with gray text.

Identification Information:

Citation:

Citation information:

Originators: John Eiler, AFSC

Title:

AFSC/ABL: Movements of Yukon River Chinook salmon

Publication date: Unknown

Geospatial data presentation form: maps and data

Series information:

Series name: NOAA Tech Memo

Issue identification: NMFS-AFSC-148

Other citation details:

Eiler, J. H., T. R. Spencer, J. J. Pella, and M. M. Masuda, and H. H. Holder. 2004. Distribution and movement patterns of chinook salmon returning to the Yukon River basin in 2000-2002. U. S. Dep. Commer., NOAA Tech. Memo. NMFS-AFSC-148, 99 p. Eiler, J. H., T. R. Spencer, J. J. Pella, and M. M. Masuda. 2006. Stock composition, run timing and movement patterns of Chinook salmon returning to the Yukon River basin in 2003. U. S. Dep. Commer., NOAA Tech. Memo. NMFS-AFSC-163, 104 p. Eiler, J. H., T. R. Spencer, J. J. Pella, and M. M. Masuda. 2006. Stock composition, run timing and movement patterns of Chinook salmon returning to the Yukon River basin in 2004. U. S. Dep. Commer., NOAA Tech. Memo. NMFS-AFSC-165, 107 p.

Description:

Abstract:

A radio telemetry study was conducted on Yukon River Chinook salmon (*Oncorhynchus tshawytscha*) during 2002-2004 to provide information on migration patterns. During 2002, 768 adult Chinook salmon returning to the basin to spawn were radio tagged in the lower Yukon River near the villages of Marshall and Russian Mission. Most (751, 97.8%) resumed upriver movements, with 270 fish harvested in fisheries and 481 fish tracked to upriver areas using remote tracking stations and aerial surveys.

Movement rates for radio-tagged fish averaged 51 km/day. Middle and upper basin stocks traveling through reaches of the Yukon River main stem averaged 54-61 km/day, although slower swimming speeds were recorded as the fish approached their natal streams. Movement rates for lower basin stocks were substantially less, averaging from 31 km/day to 37 km/day, possibly due to the shorter distances traveled to reach their spawning areas.

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Understanding the movement patterns exhibited by Chinook salmon during their upriver migration can provide valuable insight into the biology, run dynamics, and management of Chinook salmon returns and their associated fisheries. The data collected during the 2002-2004 study is being analyzed to determine if the observed movements and associated factors within different reaches of the basin can be used to better understand and predict Chinook salmon migratory behavior.

Purpose:

This dataset contains radio telemetry data on migration patterns of Yukon River Chinook salmon (*Oncorhynchus tshawytscha*) during 2002-2004.

Time period of content:

Time period information:

Range of dates/times:

Beginning date: 2002

Ending date: 2004

Currentness reference:

ground condition

Status:**Progress:** Complete**Maintenance and update frequency:** None planned**Spatial domain:****Description of geographic extent:**

Yukon River Basin

Bounding coordinates:**West bounding coordinate:** -164**East bounding coordinate:** -133**North bounding coordinate:** 68**South bounding coordinate:** 59**Keywords:****Theme:****Theme keywords:** Biota, 002**Theme keyword thesaurus:** ISO 19115 Topic Categories**Theme:****Theme keywords:** Chinook salmon, migration, spawning**Theme keyword thesaurus:** None**Place:****Place keywords:** Alaska, Yukon River**Place keyword thesaurus:** Geographic Names Information System**Taxonomy:****Keywords/taxon:****Taxonomic keywords:** collection, multiple species, invertebrates**Taxonomic keyword thesaurus:**None**Taxonomic classification:****Taxon rank name:** Empire**Taxon rank value:** Biovitae**Applicable common names:** Carbon-based lifeforms**Taxonomic classification:****Taxon rank name:** Kingdom**Taxon rank value:** Animalia

Taxonomic classification:

Taxon rank name: Phylum
Taxon rank value: Chordata

Taxonomic classification:

Taxon rank name: Subphylum
Taxon rank value: Vertebrata

Taxonomic classification:

Taxon rank name: Superclass
Taxon rank value: Osteichthyes

Taxonomic classification:

Taxon rank name: Class
Taxon rank value: Actinopterygii

Taxonomic classification:

Taxon rank name: Subclass
Taxon rank value: Neopterygii

Taxonomic classification:

Taxon rank name: Infraclass
Taxon rank value: Teleostei

Taxonomic classification:

Taxon rank name: Superorder
Taxon rank value: Protacanthopterygii

Taxonomic classification:

Taxon rank name: Order
Taxon rank value: Salmoniformes

Taxonomic classification:

Taxon rank name: Family
Taxon rank value: Salmonidae

Taxonomic classification:

Taxon rank name: Subfamily
Taxon rank value: Salmoninae

Taxonomic classification:**Taxon rank name:** Genus**Taxon rank value:** Oncorhynchus**Applicable common names:** Salmon**Taxonomic classification:****Taxon rank name:** Species**Taxon rank value:** tshawytscha**Applicable common names:** Chinook
salmon**Access constraints:** Contact the Point of Contact for data request form.**Use constraints:**

User must read and fully comprehend the metadata prior to use. Data should not be used beyond the limits of the source scale. Acknowledgement of NOAA, as the source from which these data were obtained, in any publications and/or other representations of these data is suggested.

Point of contact:**Contact information:****Contact person primary:****Contact person:** John Eiler**Contact organization:** National Oceanic and Atmospheric Administration (NOAA) Alaska Fisheries Science Center (AFSC) Auke Bay Laboratories (ABL)**Contact address:****Address type:** mailing and physical**Address:**

17109 Point Lena Loop Road

City: Juneau**State or province:** AK**Postal code:** 99801**Country:** USA**Contact voice telephone:** 907-789-6000**Contact facsimile telephone:** 907-789-6094**Contact electronic mail address:** john.eiler@noaa.gov**Contact instructions:**

The e-mail address directs you to the person most knowledgeable about this data. If an alternative contact

person becomes necessary, use the voice phone number for referral.

Data set credit:

Alaska Department of Fish and Game
Department of Fisheries and Oceans Canada
U.S.-Canada Yukon River Panel
Bering Sea Fishermen's Association
Yukon River Drainage Fishers Association

Native data set environment:

Microsoft Excel spreadsheets

[Back to Top](#)

Data Quality Information:

Logical consistency report:

No logical consistency test were run.

Completeness report:

Tagging data were double entered to check for errors.
Fish distribution data were reviewed post season to ensure accuracy and identify entry and interpretation errors.

Lineage:

Methodology:

Methodology type:

Field

Methodology description:

See methodology in following papers: Eiler, J. H., T. R. Spencer, J. J. Pella, and M. M. Masuda. 2006. Stock composition, run timing and movement patterns of Chinook salmon returning to the Yukon River basin in 2004. U. S. Dep. Commer., NOAA Tech. Memo. NMFS-AFSC-165, 107 p. Eiler, J. H. and M. A. Masters. 2000. A database-GIS mapping program for summarizing salmon telemetry data from the Yukon River basin, Alaska and Yukon Territory. Pages 138-144 in J. H. Eiler, D. Alcorn, and M. R. Neuman, editors. Proceedings of the 15th International Symposium on Biotelemetry. Juneau, Alaska. International Society on Biotelemetry. Wageningen, The Netherlands. 733 p. Eiler, J. H. 1995. A remote satellite-linked tracking system for studying Pacific salmon with radio telemetry. Transactions of the American Fisheries Society 124:184-193.

Process step:

Process description:

See Source Information for cites of papers containing methodology.

Process date: Unknown

[Back to Top](#)

Entity and Attribute Information:

Detailed description:

Entity type:

Entity type label: Region Area

Entity type definition:

Table containing Stream name, Area name, Area, Region name, and Region

Entity type definition source:

Database developer

Attribute:

Attribute label: Stream name

Attribute definition:

Name of stream or creek.

Attribute definition source:

Database developer

Attribute domain values:

Unrepresentable domain:

None

Attribute:

Attribute label: Area name

Attribute definition:

Name of section of area, can be repeated.

Attribute definition source:

Database developer

Attribute domain values:

Unrepresentable domain:

None

Attribute:

Attribute label: Area

Attribute definition:

Discrete spawning tributary (NOTE: synonymous with Stock)

Attribute definition source:

Database developer

Attribute domain values:

Unrepresentable domain:

None

Attribute:

Attribute label: Region name

Attribute definition:

Name of region

Attribute definition source:

Database developer

Attribute domain values:

Unrepresentable domain:

None

Attribute:

Attribute label: Region

Attribute definition:

Section of Yukon River basin

Attribute definition source:

Database developer

Attribute domain values:

Unrepresentable domain:

None

Detailed description:

Entity type:

Entity type label: RTS

Entity type definition:

Table containing sampling station information.

Entity type definition source:

Database developer

Attribute:

Attribute label: Station

Attribute definition:

Remote tracking station located at sites within the Yukon River basin.

Attribute definition source:

Database developer

Attribute domain values:

Unrepresentable domain:

None

Attribute:

Attribute label: ID

Attribute definition:

Unique id number of sample

Attribute definition source:

Database developer

Attribute domain values:

Unrepresentable domain:

None

Attribute:

Attribute label: Name

Attribute definition:

None

Attribute definition source:

Database developer

Attribute domain values:

Unrepresentable domain:

None

Attribute:

Attribute label: Lat

Attribute definition:

Latitude degrees North

Attribute definition source:

Database developer

Attribute domain values:

Unrepresentable domain:

None

Attribute:

Attribute label: Long

Attribute definition:

Longitude

Attribute definition source:

Database developer

Attribute domain values:

Unrepresentable domain:

None

Attribute:

Attribute label: Site Type

Attribute definition:

None

Attribute definition source:

Database developer

Attribute domain values:

Unrepresentable domain:

None

Attribute:

Attribute label: Paimiut (BE)

Attribute definition:

None

Attribute definition source:

Database developer

Attribute domain values:

Unrepresentable domain:

None

Attribute:

Attribute label: Distance 2002 Previous RTS

Attribute definition:

None

Attribute definition source:

Database developer

Attribute domain values:
Unrepresentable domain:
None

Attribute:
Attribute label: Previous RTS
Attribute definition:
None
Attribute definition source:
Database developer

Attribute domain values:
Unrepresentable domain:
None

Attribute:
Attribute label: Distance 2003 (if different) Paimiut (BE)
Attribute definition:
None
Attribute definition source:
Database developer

Attribute domain values:
Unrepresentable domain:
None

Attribute:
Attribute label: Distance 2003 (if different) Previous RTS
Attribute definition:
None
Attribute definition source:
Database developer

Attribute domain values:
Unrepresentable domain:
None

Attribute:
Attribute label: Distance 2003 (if different) Previous RTS
Attribute definition:

None

Attribute definition source:

Database developer

Attribute domain values:

Unrepresentable domain:

None

Attribute:

Attribute label: Distance 2004 (if different) Paimiut (BE)

Attribute definition:

None

Attribute definition source:

Database developer

Attribute domain values:

Unrepresentable domain:

None

Attribute:

Attribute label: Distance 2004 (if different) Previous RTS

Attribute definition:

None

Attribute definition source:

Database developer

Attribute domain values:

Unrepresentable domain:

None

Attribute:

Attribute label: Distance 2004 (if different) Previous RTS

Attribute definition:

None

Attribute definition source:

Database developer

Attribute domain values:

Unrepresentable domain:

None

Attribute:**Attribute label:** Comment**Attribute definition:**

None

Attribute definition source:

Database developer

Attribute domain values:**Unrepresentable domain:**

None

Detailed description:**Entity type:****Entity type label:** Database Table**Entity type definition:**

Table containing fish information.

Entity type definition source:

Database developer

Attribute:**Attribute label:** Fish no.**Attribute definition:**

Identification number for fish; serves as a reference number for all samples, capture information, movement data, etc.

Attribute definition source:

Database developer

Attribute domain values:**Unrepresentable domain:**

None

Attribute:**Attribute label:** Year**Attribute definition:**

Year of study (e.g., 2002, 2003, 2004)

Attribute definition source:

Database developer

Attribute domain values:**Unrepresentable domain:**

None

Attribute:**Attribute label:** CDate**Attribute definition:**

Capture date: day-month-year military time (e.g. 03-Jul-02 23:34)

Attribute definition source:

Database developer

Attribute domain values:**Unrepresentable domain:**

None

Attribute:**Attribute label:** RM Passage**Attribute definition:**

Passage of fish through Russian Mission vicinity. Same as CDate for fish tagged at Russian Mission. For fish tagged at Marshall in 2002, is 1.88 days after CDate.

Attribute definition source:

Database developer

Attribute domain values:**Unrepresentable domain:**

None

Attribute:**Attribute label:** CDAY**Attribute definition:**

Numerical value for CDate with June 1 = 1, June 2 = 2, etc. (see below)

Attribute definition source:

Database developer

Attribute domain values:**Unrepresentable domain:**

None

Attribute:**Attribute label:** CWEEK**Attribute definition:**

Week of capture; weeks numbered sequentially with first week of January = CWeek 1 (see below)

Attribute definition source:

Database developer

Attribute domain values:**Unrepresentable domain:**

None

Attribute:**Attribute label:** CWEEK GROUP**Attribute definition:**

Same as Cweek, but weeks in early (CWeek 23 and CWeek 24) and late run (CWeek 28 and CWeek 29) lumped together due to small sample size.

Attribute definition source:

Database developer

Attribute domain values:**Unrepresentable domain:**

None

Attribute:**Attribute label:** LENGTH**Attribute definition:**

Mid-eye to fork of tail to nearest 5 mm (e.g. 655)

Attribute definition source:

Database developer

Attribute domain values:**Unrepresentable domain:**

None

Attribute:**Attribute label:** LENGTH GROUP**Attribute definition:**

Fish length grouped by size: 500-600, 700, 800, 900-1000

Attribute definition source:

Database developer

Attribute domain values:**Unrepresentable domain:**

None

Attribute:**Attribute label:** AGE

Attribute definition:

Years of life based on scale analysis

Attribute definition source:

Database developer

Attribute domain values:**Unrepresentable domain:**

None

Attribute:

Attribute label: GENDER

Attribute definition:

M=male, F=female, U=not determined

Attribute definition source:

Database developer

Attribute domain values:**Unrepresentable domain:**

None

Attribute:

Attribute label: COLOR

Attribute definition:

Fish coloration: 1=iridescent silver, 2=dull silver, 3=blush (initial spawning coloration, dull silver with reddish tinges to pronounced reddish, black)

Attribute definition source:

Database developer

Attribute domain values:**Unrepresentable domain:**

None

Attribute:

Attribute label: CLASS

Attribute definition:

Classification based on final location and status

Attribute definition source:

Database developer

Attribute domain values:**Unrepresentable domain:**

None

Attribute:

Attribute label: CATEGORY

Attribute definition:

Final status of fish based on tracking data, fishery recoveries, and spawning ground surveys

Attribute definition source:

Database developer

Attribute domain values:

Unrepresentable domain:

None

Attribute:

Attribute label: AREA

Attribute definition:

Discrete spawning tributary (NOTE: synonymous with Stock)

Attribute definition source:

Database developer

Attribute domain values:

Unrepresentable domain:

None

Attribute:

Attribute label: FISHERY

Attribute definition:

None

Attribute definition source:

Database developer

Attribute domain values:

Unrepresentable domain:

None

Attribute:

Attribute label: Main Stem Location

Attribute definition:

None

Attribute definition source:

Database developer

Attribute domain values:
Unrepresentable domain:
None

Attribute:
Attribute label: REGION
Attribute definition:
Section of Yukon River basin
Attribute definition source:
Database developer

Attribute domain values:
Unrepresentable domain:
None

Attribute:
Attribute label: STOCK
Attribute definition:
Discrete spawning population (NOTE: synonymous with Area)
Attribute definition source:
Database developer

Attribute domain values:
Unrepresentable domain:
None

Attribute:
Attribute label: STATION
Attribute definition:
Remote tracking station located at sites within the Yukon River basin
Attribute definition source:
Database developer

Attribute domain values:
Unrepresentable domain:
None

Attribute:
Attribute label: ELEVATION
Attribute definition:

Elevation at river level at station site

Attribute definition source:

Database developer

Attribute domain values:

Unrepresentable domain:

None

Attribute:

Attribute label: PASSAGE

Attribute definition:

Date and time (day-month-year military time) that radio-tagged fish passed remote tracking station

Attribute definition source:

Database developer

Attribute domain values:

Unrepresentable domain:

None

Attribute:

Attribute label: DAY

Attribute definition:

Numerical value for passage date at final station

Attribute definition source:

Database developer

Attribute domain values:

Unrepresentable domain:

None

Attribute:

Attribute label: TIME

Attribute definition:

Time (days) taken by radio-tagged fish to travel from previous station to current station

Attribute definition source:

Database developer

Attribute domain values:

Unrepresentable domain:

None

Attribute:**Attribute label:** DISTANCE**Attribute definition:**

Distance (km) taken by radio-tagged fish to travel from previous station to current station

Attribute definition source:

Database developer

Attribute domain values:**Unrepresentable domain:**

None

Attribute:**Attribute label:** RATE**Attribute definition:**

Movement rate (km/day) of radio-tagged fish from previous station to current station

Attribute definition source:

Database developer

Attribute domain values:**Unrepresentable domain:**

None

Attribute:**Attribute label:** ECHANGE**Attribute definition:**

Elevational change from previous station to current station

Attribute definition source:

Database developer

Attribute domain values:**Unrepresentable domain:**

None

Attribute:**Attribute label:** ECRATE**Attribute definition:**

Elevational change from previous station to current station standardized by distance (elevation change/distance traveled)

Attribute definition source:

Database developer

Attribute domain values:
Unrepresentable domain:
None

[Back to Top](#)

Distribution Information:

Distributor:

Contact information:

Contact person primary:

Contact person: John Eiler

Contact organization: National Oceanic and Atmospheric Administration (NOAA) Alaska Fisheries Science Center (AFSC) Auke Bay Laboratories (ABL)

Contact address:

Address type: mailing and physical

Address:

17109 Point Lena Loop Road

City: Juneau

State or province: AK

Postal code: 99801

Country: USA

Contact voice telephone: 907-789-6000

Contact facsimile telephone: 907-789-6094

Contact electronic mail address: john.eiler@noaa.gov

Contact instructions:

The e-mail address directs you to the person most knowledgeable about this data. If an alternative contact person becomes necessary, use the voice phone number for referral.

Resource description: Offline data

Distribution liability:

The user is responsible for the results of any application of this data for other than its intended purpose.

[Back to Top](#)

Metadata Reference Information:

Metadata date: 20081014

Metadata review date: 20100309

Metadata contact:

Contact information:

Contact person primary:

Contact person: Emily Fergusson

Contact organization: National Oceanic and Atmospheric Administration (NOAA) Alaska Fisheries Science Center (AFSC) Auke Bay Laboratories (ABL)

Contact position: Metadata coordinator

Contact address:

Address type: mailing and physical

Address:

17109 Point Lena Loop Road

City: Juneau

State or province: AK

Postal code: 99801

Country: USA

Contact voice telephone: Use e-mail to contact the metadata coordinator.

Contact facsimile telephone: 907-789-6094

Contact electronic mail address: AFSC.metadata@noaa.gov

Metadata standard name: FGDC Biological Data Profile of the Content Standard for Digital Geospatial Metadata

Metadata standard version: FGDC-STD-001.1-1999

[Back to Top](#)