Regional Operational Plan No. ROP.SF.3F.2024.08

Seasonal Distribution of Humpback Whitefish in the Slana River

by

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and

Matt Tyers

October 2024

Alaska Department of Fish and Game Divisions of Sport Fish and Commercial Fisheries

Symbols and Abbreviations

The following symbols and abbreviations, and others approved for the Système International d'Unités (SI), are used without definition in the following reports by the Divisions of Sport Fish and of Commercial Fisheries: Fishery Manuscripts, Fishery Data Series Reports, Fishery Management Reports, and Special Publications. All others, including deviations from definitions listed below, are noted in the text at first mention, as well as in the titles or footnotes of tables, and in figures or figure captions.

Weights and measures (metric)

centimeter	cm
deciliter	dL
gram	g
hectare	ha
kilogram	kg
kilometer	km
liter	L
meter	m
milliliter	mL
millimeter	mm

Weights and measures (English)

cubic feet per second	ft^3/s
foot	ft
gallon	gal
inch	in
mile	mi
nautical mile	nmi
ounce	oz
pound	lb
quart	qt
yard	yd

Time and temperature

day	d
degrees Celsius	°C
degrees Fahrenheit	°F
degrees kelvin	K
hour	h
minute	min
second	s

Physics and chemistry

all atomic symbols	
alternating current	AC
ampere	A
calorie	cal
direct current	DC
hertz	Hz
horsepower	hp
hydrogen ion activity (negative log of)	pH
parts per million	ppm
parts per thousand	ppt, ‰
volts	V
watts	W

General

Alaska Administrative Code	AAC
all commonly accepted abbreviations	e.g., Mr., Mrs., AM, PM, etc.
all commonly accepted professional titles	e.g., Dr., Ph.D., R.N., etc.
at	@
compass directions:	
east	E
north	N
south	S
west	W
copyright	©
corporate suffixes:	
Company	Co.
Corporation	Corp.
Incorporated	Inc.
Limited	Ltd.
District of Columbia	D.C.
et alii (and others)	et al.
et cetera (and so forth)	etc.
exempli gratia (for example)	e.g.
Federal Information Code	FIC
id est (that is)	i.e.
latitude or longitude	lat or long
monetary symbols (U.S.)	$, ¢
months (tables and figures): first three letters	Jan,...,Dec
registered trademark	®
trademark	™
United States (adjective)	U.S.
United States of America (noun)	USA
U.S.C.	United States Code
U.S. state	use two-letter abbreviations (e.g., AK, WA)

Mathematics, statistics

all standard mathematical signs, symbols and abbreviations	
alternate hypothesis	H_A
base of natural logarithm	*e*
catch per unit effort	CPUE
coefficient of variation	CV
common test statistics	(F, t, χ^2, etc.)
confidence interval	CI
correlation coefficient (multiple)	R
correlation coefficient (simple)	r
covariance	cov
degree (angular)	°
degrees of freedom	df
expected value	*E*
greater than	>
greater than or equal to	≥
harvest per unit effort	HPUE
less than	<
less than or equal to	≤
logarithm (natural)	ln
logarithm (base 10)	log
logarithm (specify base)	log_2, etc.
minute (angular)	′
not significant	NS
null hypothesis	H_O
percent	%
probability	P
probability of a type I error (rejection of the null hypothesis when true)	α
probability of a type II error (acceptance of the null hypothesis when false)	β
second (angular)	″
standard deviation	SD
standard error	SE
variance	
population	Var
sample	var

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SIGNATURE PAGE

Project Title:	Seasonal Distribution of Humpback Whitefish in the Slana River
Project leader(s):	Corey Schwanke, *Fishery Biologist II*
Division, Region, and Area	Division of Sport Fish, Region III, Fairbanks
Project Nomenclature:	T-10-13 P-27 AYK Whitefish & BLM L20AC00197
Period Covered	September 2024–October 2028
Field Dates:	September 2024–October 2026
Plan Type:	Category II

Approval

Title	Name	Signature	Date
Project Leader	Corey Schwanke		
Biometrician	Matt Tyers		
Area Manager	Mark Somerville		
Research Coordinator	James Savereide		
Regional Supervisor	Jeff Estensen		

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ABSTRACT

This study will describe the seasonal distribution of humpback whitefish *Coregonus pidschian* captured in the Slana River during fall 2024. Humpback whitefish will be captured using electrofishing techniques during late September before the onset of spawning. One hundred adult humpback whitefish ≥320 mm FL will be surgically implanted with radio tags that will operate for ~25 months. Radiotagged humpbacked whitefish will be aerially tracked for 2 years to determine overall distribution, including overwintering, spawning, and summering areas, as well as migration timing among these locations. A fixed-tracking station will be used to track if/when humpback whitefish leave the Slana River drainage.

Keywords: humpback whitefish *Coregonus pidschian*, Slana River, radiotelemetry, seasonal distribution, spawning, movements.

PURPOSE

Residents have been spearing whitefish in late fall prior to freeze-up in the Slana River for a long time with little to no monitoring from the Alaska Department of Fish and Game (ADF&G). The fishery has been concentrated in the braided stretch of river with access from behind Mentasta Village. Effort and harvest have never been monitored, but it is believed on years with easy access and good weather, more than 1,000 whitefish have been harvested annually. Currently access is limited due to a dilapidated bridge crossing the inlet stream to Mentasta Lake, but participation and harvest still occurs. The purpose of this study is to determine the spawning (late fall/early winter), overwintering, and summer feeding distributions of mature-sized humpback whitefish (≥320 mm FL) radiotagged during fall in the Slana River. Resulting data will be used to identify the geographic extent of this population and timing of movements into and out of the Slana River.

BACKGROUND

The Slana River is part of the Upper Copper River drainage (Figure 1). It is road-accessible from the Glenn Highway (Tok Cutoff) as it parallels the road for much of its lower reaches and is crossed by roads at 2 different locations. The Nabesna Road crosses the lower end of the river about 1.75 river kilometers (RKM) from the Slana River's confluence with the Copper River. The second access point is at RKM 11.5 where a rudimentary boat launch exists near mile post 66 of the Tok Cutoff. The next major access point is at approximately 37.5 RKM where the river flows under the Tok Cutoff at approximately mile post 75.5. The Upper Slana River can be accessed from Mentasta Lake, or the road behind Mentasta Village, but much of this land is private.

Under general sport fish regulations for the area, spearing of whitefish is allowed from 1 October through 31 March with no bag or possession limit (5 AAC 52.022). The braids located in the Slana River immediately south of Mentasta Lake have traditionally been a popular location to spear whitefish. Over a dozen people would participate in the fishery some nights prior to freeze-up, and annual harvest likely exceeded 1,000 fish at times. No monitoring has been conducted on this fishery, and most observations are personal or anecdotal. Effort has decreased in recent years because a bridge allowing vehicle traffic directly to the river has deteriorated, but participation still exists with the use of ATV vehicles or walking beyond the bridge.

It is believed that whitefish concentrate in the braided sections south of Mentasta Lake for spawning purposes. Brown and Shink (2020) determined that whitefish in nearby Nabesna and Chisana Rivers spawn in October. On 26 and 27 September 2023, ADF&G staff sampled 182 whitefish with electrofishing gear in the Slana River south of Mentasta Lake (Figure 2). All fish were mature and ranged from 316 to 460 mm FL and averaged 353 (SD=23) mm FL (Table 1).

Females averaged 351 (SD=23) mm FL and males 354 (SD=23) mm FL. Other fish captured included 27 round whitefish *Prosopium cylindraceum*, 2 Arctic grayling *Thymallus Arcticus*, 1 burbot *Lota lota*, and 1 slimy sculpin *Cottus cognatus*. It should be noted that these species were not intentionally targeted, and their proportions in this catch do not represent their true proportions.

This telemetry study is designed to track the seasonal movements of humpback whitefish residing in the Upper Slana River during fall (late September–early October), with an emphasis on the spawning period, post spawn dispersion, and overwintering and summering locations.

OBJECTIVES

The primary objectives of this study are to:

Describe the seasonal (spawning, overwintering, and summer feeding) distribution of mature-sized humpback whitefish (≥320 mm FL) in the Slana River from fall 2024 to early winter 2026.

METHODS

STUDY AREA

The Slana River is a north bank tributary of the Upper Copper River. The study area for radiotagging will include the southwest shore of Mentasta Lake, the outlet creek, and 7.5 RKM of the Slana River where the lake outlet stream flows into the Slana River (5 RKM upstream and 2.5 RKM downstream). The study area for radiotracking will encompass the entire Slana River as well as the Copper River mainstem. It is possible that fish will ascend other tributaries, so a fixed-tracking station will be installed near the confluence of the Slana and Copper Rivers, and the study area for radiotracking will be expanded based on detections of radiotagged fish past this station.

STUDY DESIGN

Overview

This study will estimate the seasonal distribution of humpback whitefish residing in the Slana River during fall 2024. A total of 100 radio tags will be deployed in late September when humpback whitefish concentrate in and around the braided sections of the Slana River south of Mentasta Lake. This area appears to hold a prespawning aggregation of fish during late September. On 26 and 27 September 2023, ADF&G staff sampled this high-density area of the Slana River and captured 182 whitefish with electrofishing gear and some milt was present in the males and random dissections indicated that spawning was close (Figure 2). A single fixed-tracking station will be placed downstream in the Slana River near its confluence with the Copper River to document if/when radiotagged fish leave the Slana River and if/when they return. The fixed-tracking station will also provide information on how extensive aerial tracking flights need to be outside of the Slana River. A series of approximately 18 aerial surveys will also be conducted from October 2024 through October 2026, a period of 25 months. The aerial telemetry data will be used to determine spawning (mid-October 2024, 2025 and 2026), overwintering (March 2025 and 2026), and summering (July 2025 and 2026) areas.

Fish Capture

A single boat equipped with electrofishing gear will be used to capture humpback whitefish. A 3-person crew will be used with one person piloting the boat and operating the electrofishing gear and 2 people using dip nets to capture fish that are stunned by the gear and rise to the surface. The electrofishing boat will be equipped with a pulsed-DC variable-voltage pulsator (Coffelt Model VVP-15) powered by a 5,000-watt single-phase gasoline generator. Anodes will consist of 4 15-mm diameter steel cables (1.5 m long) spaced 1 m apart, arranged perpendicular to the long axis of the boat and positioned 2.1 m forward of the bow. The unpainted bottom of the boat will serve as the cathode. The electrical output (voltage, amperage, and cycle) will be adjusted based on observed responses of shocked fish. Initially, settings on the pulsator will be set at 50% duty cycle and 30 Hz. To minimize fish mortality and injury, electrical output values will be adjusted to minimize exposure to zones of tetany (Snyder 1992). Because output amperage varies at a given voltage due to conductivity, substrate, and water depth, the boat operator will adjust voltage (250–300 V) to keep output between 2 and 3 amperes. A second boat with 2 people will follow the electrofishing boat and help with radiotagging.

Radio tags will be distributed at a relatively high density: 70 radio tags in the 5 RKM stretch of the Slana River above Mentasta Lake outlet, 10 along the 0.75 RKM of the southwest shore of Mentasta Lake, 10 in the 1.25 RKM outlet creek of Mentasta Lake, and 10 in the 3 RKM stretch below the outlet creek confluence (Figure 3). This scheme helps spread out tags assuming that run timing may be different among fish potentially coming from discrete locations, but will serve as a guideline only. Areas will not be fished 2 times just to get a small number of fish to fulfill the proposed allocations.

Telemetric Procedures

Standardized telemetry practices will be employed. Each humpback whitefish will be anesthetized using Aqui-S 20E and implanted with a radio tag following surgical methods detailed by Brown et al. (2002). The transmitters selected for this project are Lotek model MCFT2-3FM radio tags, which will operate for approximately 25 months with a continuous pulse rate of 9.2–10 pulses per minute (about 1 pulse every 6–6.5 seconds). Radio tags will operate on 150.400 MHz and will have motion detectors to help decipher mortalities.

A single fixed-tracking station will be installed on the Lower Slana River about 1 RKM above the Copper River confluence a week before radiotagging. It is expected that unit power requirements will exceed solar input and the station will cease functioning by late October. By late March the following year, solar power will be sufficient to maintain the station again. This station will include 2 deep-cycle batteries, a solar panel, an antenna switch box, a steel housing box, 2 Yagi antennas (1 pointed upstream and 1 pointed downstream), and a Lotek SRX 600 receiver. The receiver will be programmed to scan the single frequency continuously, from both antennas, then the upstream antenna, and then the downstream antenna. Signal strengths from the antennas will be used to aid in the determination of direction of travel. Decoded frequencies and codes will be recorded by the receiver along with date, time, and radio tag signal strength.

Aerial tracking flights will be conducted using a fixed-wing aircraft and a Lotek SRX 1200 receiver with an internal global positioning system (GPS) that will record time and location data. Over a 25-month period, approximately 18 surveys will be conducted. This is considered a maximum number of surveys and assumes movement will be relatively widespread and possibly outside of the Slana River. The frequency of surveys will also depend on the number of surviving fish; fewer surveys will be flown if sample sizes are lower than expected. All aerial surveys will coincide with periods before, during, and after major movements to spawning, overwintering, and summer feeding areas. Probable dates of surveys are listed in the *Schedule and Reports* section of this plan.

DATA COLLECTION AND REDUCTION

For each humpback whitefish captured, data collected will include: 1) date, 2) measurement of fish length to the nearest 1 mm FL; 3) location (RKM and GPS coordinates); and, 4) radio tag frequency and code.

During all aerial surveys, the receiver (Lotek SRX 1200) will automatically record date, time, and location (GPS decimal-degree, Datum WGS84) of radiotagged fish. After each aerial tracking survey, the receiver will be downloaded, sorted by frequency, code, and signal strength, and the data point with the strongest signal strength for each fish will be recorded as that fish's location. An inseason initial fate will be given based on the radio tag motion sensor, either "A" for active, "I" for inactive, or "M" for missing for that date.

After all the aerial survey data is collected and initial data reduction is complete, each fish's aerial tracking location will be examined in ArcMap and motion sensor data will be reviewed to determine the fate of each fish for each tracking survey post-season. Reviewing the movement history of each radiotagged fish is required because the motion sensors sometimes do not accurately reflect the fate of a tagged fish during a given survey. The history of sensor recordings for each fish will be examined to determine when and if the fish died, and its fate will be updated for subsequent surveys. For example, a fish with an inactive signal for one or more surveys that later made substantial movements and emitted an active signal will be considered alive for the inactive period. Conversely, a fish with an intermittent active signal, while exhibiting no detectable movement throughout the tracking history, will be considered dead at the time of consecutive inactive signals. A post-season fate will be given for each fish for each survey: "A" for active, "I" for inactive, or "M" for missing for that date.

Fixed-tracking station data will be downloaded every 2 weeks. After each download, data will be sorted by frequency, code, and signal strength. Fish movement past the tracking station will be examined on a fish -by-fish basis; the number of times a fish moved past the tracking station, signal strength, and antenna detections will be reviewed. Once it is determined that a fish passed the tracking station, it will be given a designation for that day based on which direction it traveled with "D" for downstream and "U" for upstream.

DATA ANALYSIS

Because the GPS locations will be recorded from a moving aircraft, the coordinates will be adjusted to the nearest point on the river system. The accuracy of determining the true locations of radiotagged fish from aerial surveys is variable (depending on the speed of the aircraft, depth of the tag in the water column, and numbers of tags in the vicinity), but an accuracy of 0.5 RKM can be achieved.

Locations of seasonal distributions of fish will be presented and summarized by plotting coordinates of all located fish deemed alive at the time of the survey onto a digitized map of the drainage using the program ArcGIS®. Variables to be measured include:

1. net distance traveled between tracking events,
2. direction traveled between tracking events,
3. net distance traveled between presumed spawning, summering, and overwintering locations; and,

4. annual home range, defined as the distance between the furthest upstream and furthest downstream locations of individual fish over the course of a year.

All of these variables will be calculated using the program R and the package developed by Tyers (2024).

Sample Size

Results from previous telemetry studies were used to guide sample size requirements and precision criteria for this study. Annual survival of radiotagged humpback whitefish in the Tanna River during a 2000–2003 study was 77%, and estimated annual survival of the same population using catch age analysis was 69% (Brown 2006). Similarly, a 2018–2019 study in the same general area estimated an annual survival of 79% (Brown and Shink 2020).

Assuming 20% tagging mortality for this study and 25% annual mortality thereafter, the number of surviving radiotagged fish can be approximated from the number of elapsed days after tagging (n_{days}) using the exponential function given below, assuming an initial deployment of 100 radiotags:

$$n_{tags} \approx 100 \times 0.8 \times 0.75^{n_{days}/365} \tag{1}$$

Assuming that the radio tags are deployed randomly throughout the sampled population, the number of radio tags found in a given seasonal use area used by some proportion of the population can be assumed to be binomially distributed; therefore, the probability of detecting such an area can be estimated using quantiles from a binomial distribution with size parameter equal to the number of surviving radiotagged fish, and probability parameter equal to the proportion of the population considered.

Furthermore, the probability of detecting all or some proportion of seasonal use areas used by a given proportion of the population may be approximated by considering a worst-case scenario of the maximum number of areas to detect. For example, a maximum of 20 areas may be used by at least 5% of the population. Assuming random deployment of tags and mutual independence of area detection, the number of areas detected may also be assumed to be binomially distributed.

Following the methodology given above, we can anticipate 79 surviving radiotagged fish in mid-October of 2024, giving a 91% chance of detecting (observing at least 2 radiotagged fish in) a given area used by 5% of the population, and at least a 73.5% chance of detecting 90% of seasonal use areas used by 5% of the population. In mid-October of 2025, we can anticipate 59 surviving radiotagged fish, respective probabilities of 80.1% and 20.9% of detecting a given seasonal use area, and at least a 90% probability of detecting all seasonal use areas used by 5% of the population.

The anticipated numbers of surviving fish and associated detection probabilities (again, defining detection as the presence of at least 2 radiotagged fish) are further detailed in Table 2 and Figure 4.

SCHEDULE AND DELIVERABLES

Dates of sampling events, milestones, and other activities are summarized in the following table.

Date(s)	Sampling Activity/Milestone
30 August 2024	Operational plan completed
27–30 Sept 2024	Deploy tracking station, radiotag 100 humpback whitefish
October 2024	Two tracking flights (initial survival/spawning)
November 2024	Single tracking flight (post spawn movement)
January 2025	Single tracking flight
March 2025	Single tracking flight (overwintering locations)
May 2025	Single tracking flight
July 2025	Single tracking flight (summering locations)
September 2025	Single tracking flight
October 2025	Two tracking flights (2nd spawning)
November 2025	Single tracking flight (post spawn movement)
January 2026	Single tracking flight
March 2026	Single tracking flight (overwintering locations)
May 2026	Single spring movement
July 2026	Single tracking flight (summering locations)
September 2026	Single tracking flight
October 2026	Two tracking flights (3rd spawning)
December 2027	FDS final report complete

RESPONSIBILITIES

ADF&G

Corey Schwanke:	Fishery Biologist II;	Overall supervision of project. Coordinate sampling schedules with project personnel. Analyze data and prepare reports with technical assistance.
April Behr:	Fishery Biologist III;	Supervise project leader and review all reports.
Matt Tyers:	Biometrician III;	Assist in preparation of statistical design of field investigation for operational plan, and review data analysis and final report.
Matt Albert:	Fishery Biologist II;	Assist with humpback whitefish capture and tagging.
Joe Spencer:	Fishery Biologist I;	Assist with humpback whitefish capture and tagging.
Brian Collyard:	F&W Tech IV;	Assist with humpback whitefish capture and tagging.
Hunter Parini:	F&W Tech III;	Assist with humpback whitefish capture and tagging.

REFERENCES CITED

Brown, R. J. 2006. Humpback Whitefish *Coregonus pidschian* of the upper Tanana River drainage. U.S. Fish and Wildlife Service, Alaska Fisheries Technical Report Number 90, Fairbanks.

Brown, R. J., C. Lunderstadt, and B. Schulz. 2002. Movement patterns of radiotagged adult humpback whitefish in the upper Tanana River drainage. U. S. Fish and Wildlife Service, Alaska Fisheries Data Series Number 2002-1.

Brown, R. J., and K. G. Shink. 2020. Trends in length, weight, and age of humpback whitefish in the Tetlin National Wildlife Refuge, Upper Tanana River Drainage, over a 20-year time period. U. S. Fish and Wildlife Service, Alaska Fisheries Technical Report 111.

Snyder, D. E. 1992. Impacts of electrofishing on fish. Report of Colorado State University Larval Fish Laboratory to U. S. Department of the Interior Bureau of Reclamation, Salt Lake City, Utah, and Glen Canyon Environmental Studies Aquatic Coordination Team, Flagstaff, Arizona.

Tyers, M. 2024. riverdist: River Network Distance Computation and Applications. R package version 0.16.3 https://CRAN.R-project.org/package=riverdist

FIGURES AND TABLES

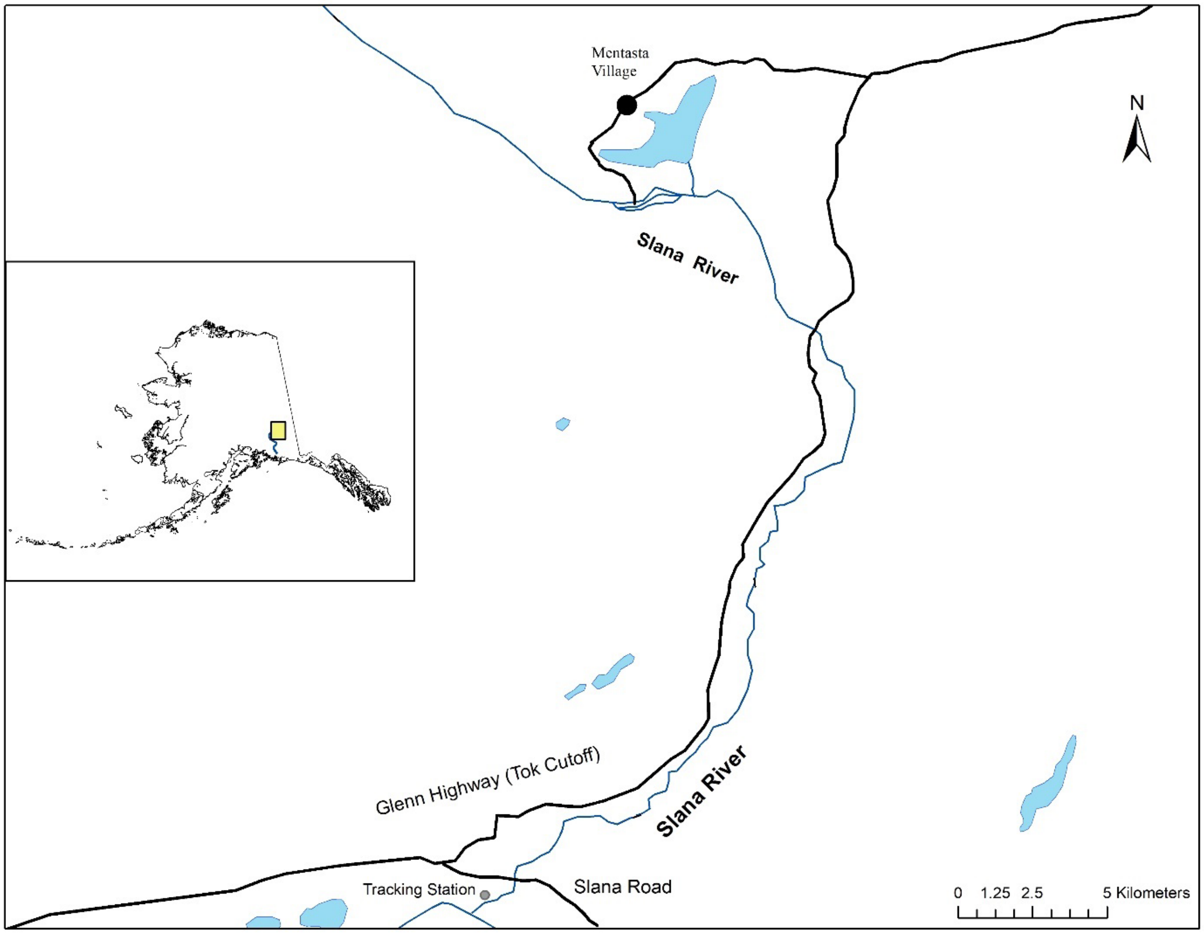

Figure 1.–Map of the Slana River drainage with location of the fixed-tracking station.

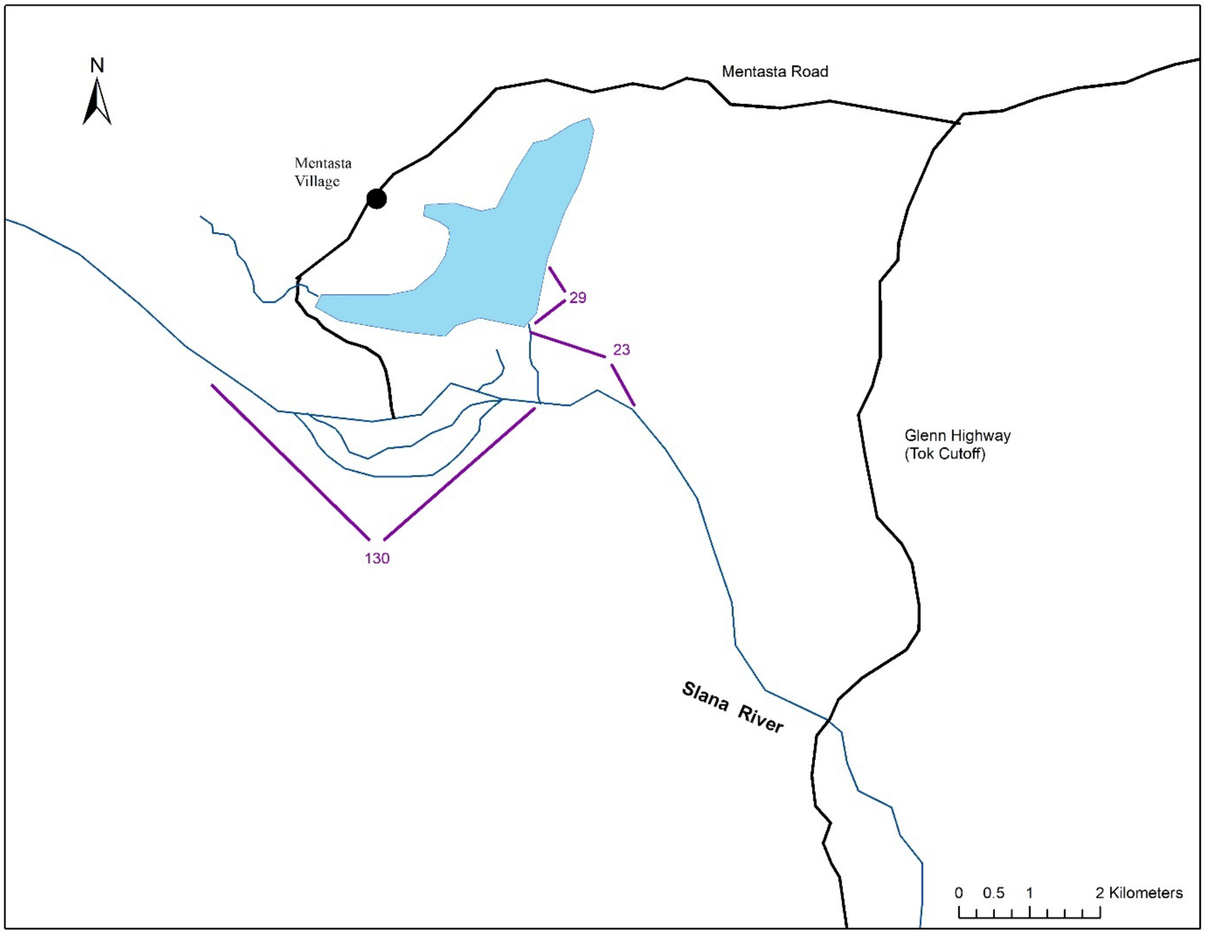

Figure 2.–Map of the study area with general location and number of humpback whitefish sampled on 26 and 27 September 2023.

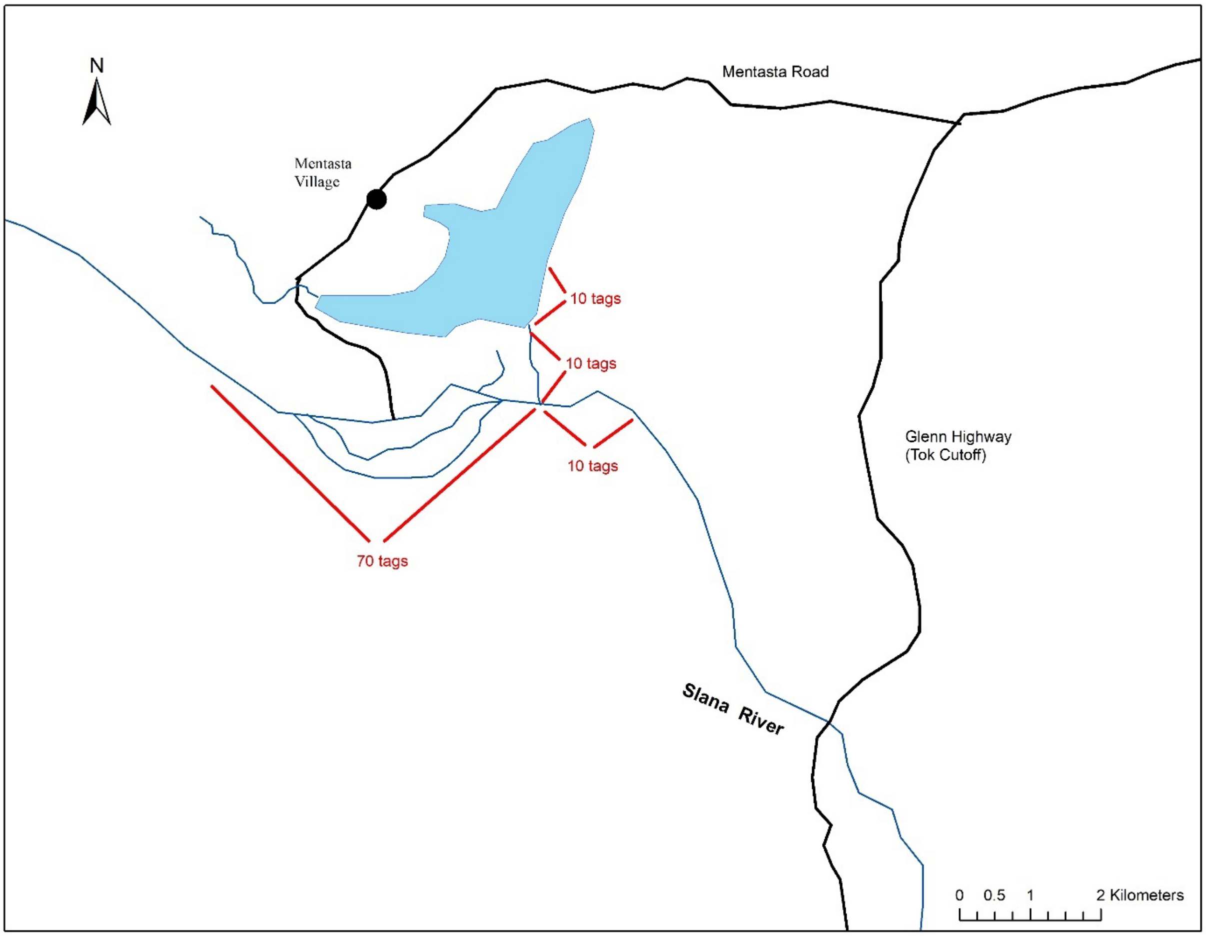

Figure 3.–Map of the study area with planned radio tag allocation.

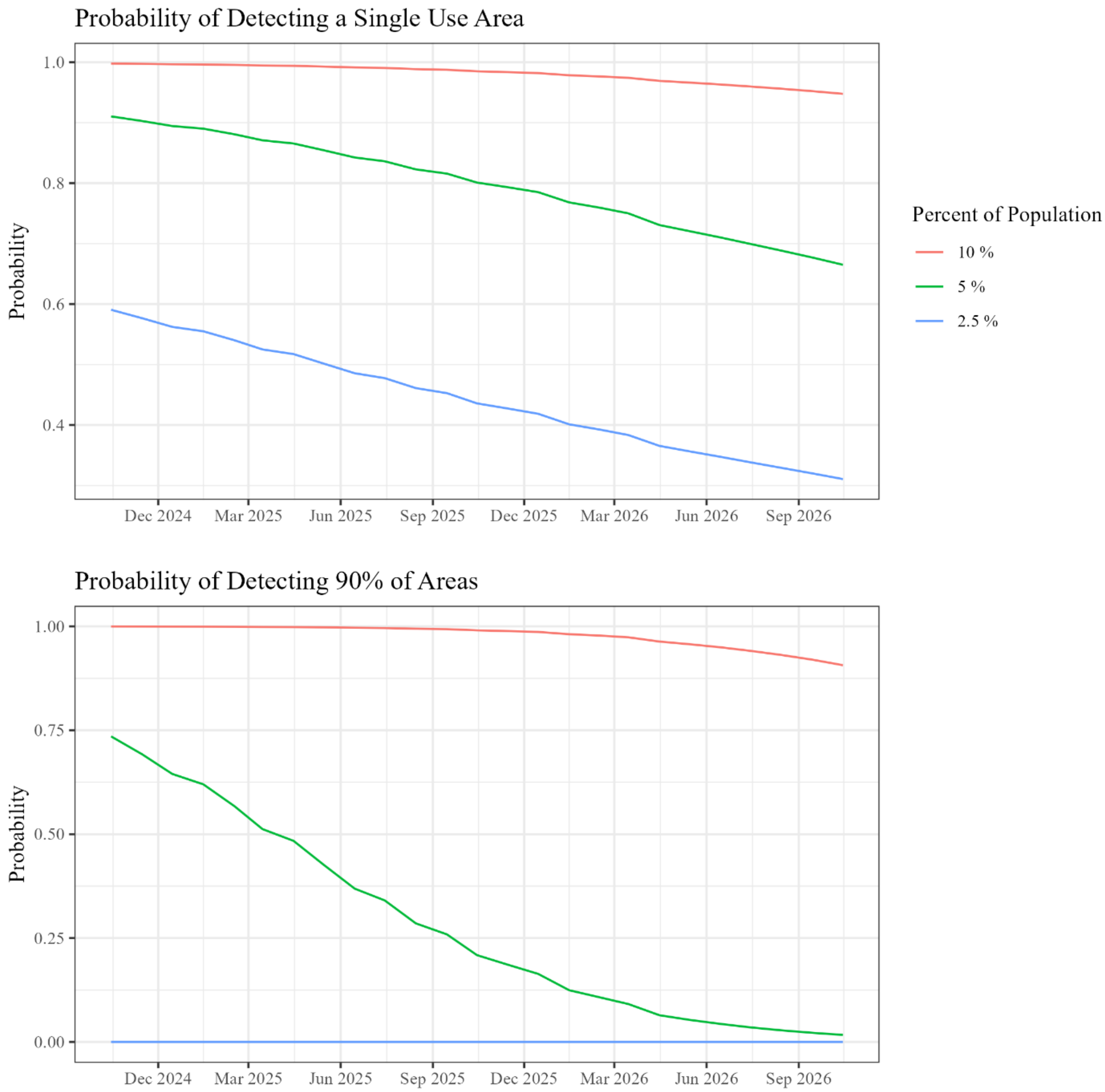

Figure 4.–Probabilities of detecting (observing at least 2 radiotagged fish in) seasonal use areas used by given proportions of the population, over the duration of the study, as estimated for the anticipated number of surviving fish, and assuming random deployment of tags and mutual independence of area detection.

Table 1.–Mean length (mm FL) of humpback whitefish collected on 9/26/2023 and 9/27/2023, Slana River.

Category	Statistic	Sample Dates 9/26/2023 & 9/27/2023
All Fish	Sample Size	182
	Mean Length	353
	Standard Deviation	23
	Minimum	316
	Maximum	490
Females	Sample Size	62
	Mean Length	351
	Standard Deviation	23
	Minimum	321
	Maximum	460
Males	Sample Size	120
	Mean Length	354
	Standard Deviation	23
	Minimum	316
	Maximum	460

Table 2.–The probability of detecting a seasonal use area, and at least 90% of seasonal use areas, used by different percentages of the population assuming 100 radio tags are deployed by 10/1/2024. The second column gives the anticipated number of live fish that will be detected on the given date according to Equation (1).

		Probability of Detecting a Single Area Used By			Probability of Detecting At Least 90% of Areas Used By		
Date	Anticipated Surviving Fish	10% of Population	5% of Population	2.5% of Population	10% of Population	5% of Population	2.5% of Population
10/15/2024	79	99.8%	91.0%	59.1%	100.0%	73.5%	0.0%
11/15/2024	77	99.7%	90.3%	57.7%	100.0%	69.2%	0.0%
12/15/2024	75	99.7%	89.4%	56.2%	99.9%	64.5%	0.0%
1/15/2025	74	99.6%	89.0%	55.5%	99.9%	62.0%	0.0%
2/15/2025	72	99.5%	88.1%	54.0%	99.9%	56.7%	0.0%
3/15/2025	70	99.5%	87.1%	52.5%	99.9%	51.2%	0.0%
4/15/2025	69	99.4%	86.6%	51.7%	99.8%	48.4%	0.0%
5/15/2025	67	99.3%	85.4%	50.2%	99.8%	42.6%	0.0%
6/15/2025	65	99.1%	84.2%	48.6%	99.7%	36.9%	0.0%
7/15/2025	64	99.0%	83.6%	47.8%	99.6%	34.1%	0.0%
8/15/2025	62	98.9%	82.3%	46.1%	99.4%	28.5%	0.0%
9/15/2025	61	98.7%	81.6%	45.3%	99.3%	25.9%	0.0%
10/15/2025	59	98.5%	80.1%	43.6%	99.1%	20.9%	0.0%
11/15/2025	58	98.3%	79.3%	42.7%	98.9%	18.6%	0.0%
12/15/2025	57	98.2%	78.5%	41.9%	98.7%	16.4%	0.0%
1/15/2026	55	97.8%	76.8%	40.1%	98.1%	12.4%	0.0%
2/15/2026	54	97.6%	75.9%	39.2%	97.8%	10.7%	0.0%
3/15/2026	53	97.4%	75.0%	38.3%	97.4%	9.1%	0.0%
4/15/2026	51	96.9%	73.1%	36.6%	96.4%	6.4%	0.0%
5/15/2026	50	96.6%	72.1%	35.6%	95.7%	5.3%	0.0%
6/15/2026	49	96.3%	71.0%	34.7%	95.0%	4.3%	0.0%
7/15/2026	48	96.0%	69.9%	33.8%	94.1%	3.5%	0.0%
8/15/2026	47	95.6%	68.8%	32.9%	93.1%	2.8%	0.0%
9/15/2026	46	95.2%	67.7%	32.0%	92.0%	2.2%	0.0%
10/15/2026	45	94.8%	66.5%	31.1%	90.7%	1.7%	0.0%