FISHERY RESEARCH

IDAHO ANADROMOUS PARR MONITORING

2021 ANNUAL REPORT

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Idaho Anadromous Parr Monitoring

2021 Annual Report

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ABSTRACT

Idaho Department of Fish and Game monitors occupancy, density, and spatial structure of anadromous salmonid parr and resident fish with snorkel surveys. In this report, we summarize the snorkel methods and results from 2021 surveys. Idaho Department of Fish and Game crews surveyed 528 total snorkel transects in 2021. Survey sites classified transects as either core (*n* = 141), non-core/resident trend (*n* = 70), intensive (*n* = 205), or extensive (*n* = 112). Mean density of steelhead *Oncorhynchus mykiss* across core transects in the Clearwater River basin was 1.0 fish per 100 m^2 (SD = 1.7 fish per 100 m^2) while mean density of Chinook Salmon *O. tshawytscha* was 4.2 fish per 100 m^2 (SD = 14.0 fish per 100 m^2). Occupancy was 0.7 for steelhead and 0.5 for Chinook Salmon. Across the last three years of surveys (excluding 2020 due to no surveys conducted), steelhead remained stable at low densities but Chinook Salmon densities have increased. Mean density of steelhead in the Salmon River basin was 1.8 fish per 100 m^2 (SD = 4.0 fish per 100 m^2) while mean density of Chinook Salmon was 3.5 fish per 100 m^2 (SD = 8.1 fish per 100 m^2). Occupancy was 0.7 for steelhead and 0.6 for Chinook Salmon. Trends in density of steelhead and Chinook Salmon in the Salmon River basin followed similar trends as in the Clearwater River basin but with generally slightly higher densities. For intensive GRTS transects in the Clearwater River basin, mean steelhead densities ranged from a low of 0.2 fish per 100 m^2 (SD = 0.5 fish per 100 m^2; occupancy = 0.3) in the Crooked River subbasin to a high of 1.8 fish per 100 m^2 (SD = 2.0 fish per 100 m^2; occupancy = 0.8) in the Fish Creek subbasin. Mean density of Chinook Salmon in the Clearwater basin was <0.1 in each of the three subbasins surveyed. For the Salmon River basin, mean steelhead densities ranged from a low of 0.2 fish per 100 m^2 (SD = 0.3 fish per 100 m^2) in the Marsh Creek subbasin to a high of 2.7 fish per 100 m^2 (SD = 3.7 fish per 100 m^2) in the North Fork Salmon River subbasin. Mean density of Chinook Salmon ranged from a low of <0.1 fish per 100 m^2 (SD = 0.1 fish per 100 m^2) in the North Fork Salmon River subbasin to a high of 2.8 fish per 100 m^2 (SD = 5.2 fish per 100 m^2) in the Marsh Creek subbasin. Occupancy was highest in the South Fork Salmon River subbasin (0.8) for steelhead and Marsh Creek subbasin (0.6) for Chinook Salmon. For extensive generalized random-tessellation stratified (GRTS) design transects in the Clearwater River basin, mean steelhead densities ranged from a low of 0.6 fish per 100 m^2 (SD = 1.0 fish per 100 m^2; occupancy = 0.4) in the Pete King Creek subbasin to a high of 3.1 fish per 100 m^2 (SD = 2.9 fish per 100 m^2; occupancy = 0.7) in the Peasley Creek subbasin. Chinook Salmon were only observed in the O'Hara Creek subbasin (0.6 fish per 100 m^2; occupancy 0.3). For the Salmon River basin, mean steelhead density was 1.7 fish per 100 m^2 (SD = 1.7 fish per 100 m^2; occupancy = 0.8) in the Panther Creek subbasin and 2.3 fish per 100 m^2 (SD = 2.2 fish per 100 m^2; occupancy = 1.0) in the Basin Creek subbasin. Mean density of Chinook Salmon was 1.0 fish per 100 m^2 (SD = 1.9 fish per 100 m^2; occupancy = 0.5) in the Panther Creek subbasin and 0.7 fish per 100 m^2 (SD = 1.1 fish per 100 m^2; occupancy = 0.5) in the Basin Creek subbasin. Mean detection efficiency across 17 mark-resight surveys in 2021 was 38.1%, similar to the 5-year mean (37.6%) for 2015-2019. Parr densities have declined in recent years. Routine snorkel surveys of core transects will allow us to continue to monitor the trends.

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INTRODUCTION

Snake River steelhead *Oncorhynchus mykiss* were listed as threatened under the Endangered Species Act (ESA) in 1997 (Busby et al. 1996). Within the Snake River basin steelhead distinct population segment (DPS), the Interior Columbia Basin Technical Recovery Team (ICBTRT) delineated six major population groups (MPGs): Lower Snake River, Grande Ronde River, Imnaha River, Clearwater River, Salmon River, and Hells Canyon Tributaries (ICBTRT 2003, 2005). However, the Hells Canyon MPG is considered to be extirpated (Table 1). Populations of Chinook Salmon *O. tshawytscha* and steelhead in the Snake River basin declined substantially following the construction of hydroelectric dams in the Snake and Columbia rivers. Snake River Chinook Salmon were listed as threatened in 1992 under the ESA. Within the Snake River Chinook Salmon evolutionarily significant unit (ESU), there are seven MPGs: Lower Snake River, Grande Ronde/Imnaha rivers, South Fork Salmon River, Middle Fork Salmon River, Upper Salmon River, Dry Clearwater, and the Wet Clearwater (Table 2). However, the Dry Clearwater and the Wet Clearwater MPGs were re-established with out-of-basin stocks after extirpation and are not listed under the ESA. A total of 28 extant demographically independent populations of Chinook Salmon have been identified.

The Idaho Department of Fish and Game (IDFG) anadromous fish program's long-range goal is to rebuild and preserve Idaho's Chinook Salmon and steelhead runs to healthy and harvestable levels to provide benefits for all users (IDFG 2019). Key objectives to achieve the management goal are: 1) maintain genetic and life history diversity of naturally occurring and hatchery produced fish; 2) rebuild naturally reproducing populations of anadromous fish to utilize existing and potential habitat at an optimal level; 3) improve overall life cycle survival sufficient for delisting and recovery by addressing key limiting factors identified in the effects of all "H's": hydropower, habitat, harvest, and hatchery; 4) allow consumptive harvest through sport and treaty fishing; and 5) coordinate Pacific Northwest regional management with Idaho anadromous management to ensure achievement of Idaho management objectives and the long-range program goal (IDFG 2019). Management to achieve these goals requires an understanding of how salmonid populations function as well as periodic status assessments (McElhany et al. 2000). However, specific data on some Snake River steelhead and Chinook Salmon populations are lacking, particularly key parameters such as abundance, age composition, genetic diversity, recruits per spawner, and survival rates (ICBTRT 2003).

Snorkel surveys are widely used for monitoring fish populations because they are a versatile and cost-effective technique. Snorkel surveys are efficient where environmental conditions limit the effectiveness of other techniques, such as electrofishing (Schill and Griffith 1984; Bonneau et al. 1995). Gear and personnel requirements are comparatively modest, so logistical demands are reduced and remote locations become feasible to sample (Hankin and Reeves 1988; Thurow 1994). Counts taken through underwater observations are non-lethal and less intrusive than other field methods, and are an appropriate means to monitor fishes listed under the ESA (e.g., Chinook Salmon, steelhead, and Bull Trout *Salvelinus confluentus*). In addition, steelhead spawning cannot be directly assessed in many Idaho streams in an efficient manner because springtime water conditions make it difficult to observe both fish and redds. Therefore, snorkel survey data describing juvenile densities and distribution are particularly important for steelhead.

Freshwater salmonid production can fluctuate greatly between years. Snorkel surveys provide information related to the density (relative abundance), distribution, and historical trends of Idaho's wild Chinook Salmon and steelhead populations. Spatially-balanced snorkel surveys can also be used to address ESA reporting needs, identify critical habitat, and help prioritize future

restoration actions. Valuable abundance and distribution information on resident salmonids are also collected during surveys in anadromous watersheds (Copeland and Meyer 2011); for example, approximately 20 surveys per year are specifically conducted to monitor resident salmonids, with funding from Dingell-Johnson Act and IDFG license funds (Appendix A3).

The snorkel program addresses four specific questions relative to population status and the effectiveness of our monitoring techniques.

1. How is abundance of anadromous salmonid parr changing over time?

2. How is steelhead emigrant production related to parr density?

3. What is the distribution and relative abundance of steelhead within the populations identified in the recovery plans?

4. What major and minor spawning habitats do anadromous salmonids occupy?

In this report, we summarize the results of snorkel surveys conducted by IDFG in anadromous waters during 2021 and compare them to prior years. A primary goal in 2021 was to survey the transects not surveyed in 2020.

METHODS

Sites are predetermined as areas where transects are established. Sites are typically points of general areas generated through a probabilistic design using GIS or from historic knowledge of high quality habitat deemed by experienced biologists. A transect is then established at the site and is defined as the stretch of stream in which records of occurrences or counts of fish are conducted. A transect will have upstream and downstream boundaries located at hydraulic controls, defined as any definite change in stream gradient that spans the entire wetted width and are typically 100 m in length but can vary (Apperson et al. 2015).

Methods for conducting fish abundance surveys by snorkeling are detailed by Apperson et al. (2015), which include specific protocols used to evaluate anadromous parr density and should be used as the primary methods reference for this report. We describe here the four specific types of transects surveyed by IDFG staff in 2021 that are used to address the questions presented above. Exceptions or additions to protocols outlined in Apperson et al. (2015) are described.

Unless otherwise noted, six salmonid species were observed within all major basins that were sampled: Chinook Salmon, Brook Trout *Salvelinus fontinalis*, Bull Trout, Mountain Whitefish *Prosopium williamsoni,* steelhead, and Westslope Cutthroat Trout *Oncorhynchus clarkii*. Trout fry (*Oncorhynchus spp* less than 75 mm) are not distinguishable to the species level and are recorded separately. Lastly, the presence of all other fishes, amphibians, and freshwater mussels were also recorded.

Three different types of surveys are outlined below: 1) Trend surveys, which consist of core, noncore, and resident transects, 2) probabilistic surveys, which consist of intensive and extensive transects, and 3) detection probability surveys, or mark-resights.

Preseason snorkel survey planning begins in late winter. This includes transect identification, crew coordination, and training. The four regionally-based (Lewiston, McCall, Nampa, and Salmon) wild salmon and steelhead snorkel survey crews meet near Lewiston during the first week of June for training. Group-training ensures uniformity in methods and increases the data quality. Subject material has evolved since the group-training format started in 2007. Current topics include fish, amphibian, and freshwater mussel identification, snorkel and mark-resight habitat survey protocols, data collection, and safety training consisting of swiftwater rescue and first aid. Training occurs in the classroom and field. Instructors include veteran crewmembers and outside professional instructors where appropriate. Snorkel survey training takes place in the Potlatch River drainage because it is one of the few major basins without a large amount of runoff in early June. In 2021, 72 transects were divided among the four crews and surveyed under close supervision as part of the training curriculum.

Trend Surveys

Core

Core transects are subsets of long-established transects that were subjectively selected because they represent suitable Chinook Salmon and steelhead habitat. These transects were originally developed by the General Parr Monitoring (GPM) program, which was a focused effort by IDFG to measure the juvenile response of wild/natural anadromous populations to off-site mitigation habitat actions and improvements (Rich et al. 1990). Core trend transects were defined as locations where at least one survey had been conducted within each 5-year period during 1984-2011. Core trend transects also included corridor surveys in the Middle Fork Salmon River, which had been completed for many consecutive years, and therefore were deemed important to IDFG management programs. Corridor survey methods are described in greater detail below. Core transect data are used to evaluate how the abundance of anadromous salmonid parr is changing over time. We identified 218 core trend transects (Stiefel et al. 2014). Two were subsequently removed from the list because of transect issues. Johns Creek 1/2 was removed because a log jam covered the transect area and changed the adjacent hydrology. Crooked River 4/MEANDER1 was removed because the river section was moved during a habitat restoration project. Based on logistical difficulty, core transects are surveyed annually, biennially, or triennially during the months of June, July, and August. Regular monitoring of these transects provides the "core" of Idaho's monitoring of the abundance trend of juvenile anadromous salmonids. These data are summarized by steelhead MPG (i.e., Clearwater, Salmon, and Hells Canyon).

Non-core

Non-core survey panels are performed for other purposes as deemed necessary for IDFG regional fishery management needs. Non-core transects are surveyed opportunistically. They are surveyed as time allows, and are not necessarily surveyed on a consistent basis. As such, they are not relied on to provide statewide status and trend information for Chinook Salmon or steelhead.

Resident

Resident snorkel survey panels in anadromous basins are conducted to address monitoring needs for resident salmonids (e.g., Westslope Cutthroat Trout, Bull Trout, and Mountain Whitefish). Resident transects are surveyed opportunistically. They are surveyed as time allows, and are not necessarily surveyed on a consistent basis. As such, they are not relied on to provide statewide status and trend information for Chinook Salmon or steelhead.

Probabilistic Surveys (GRTS)

In 2007, a probabilistic approach was adopted for establishing transects to obtain a spatially-balanced and representative set of sample transects. A generalized random-tessellation stratified (GRTS) design (Stevens and Olsen 2004) was used to obtain estimates of steelhead parr density at the population scale. The GRTS design randomly selects a suite of transects that are spatially distributed evenly across the available distribution of Chinook Salmon and steelhead parr (Stevens and Olsen 2004). Crews are provided an ordered list of transects "such that each successive site on the list maintains the spatial balance of the full set of sites in the sample" (Stevens and Olsen 2004). The crew then surveys or attempts to survey higher priority transects before lower priority transects would be surveyed. Extra transects, up to two times the sample goals, are included on the transect list in case some sites cannot be sampled.

Intensive

Panels of intensive transects were developed to evaluate the relationship between fish density from snorkel surveys and juvenile steelhead emigrant abundance derived from rotary screw traps over several years. Intensive panel surveys are generally conducted annually upstream of associated screw traps, and generally consist of at least 20 transects. In 2021, we continued monitoring the Potlatch River (lower Clearwater River steelhead population), Fish Creek (Lochsa River steelhead population), Crooked River (South Fork Clearwater River steelhead population), Marsh Creek (Upper Middle Fork Salmon River steelhead population), North Fork Salmon River (North Fork Salmon River steelhead population), South Fork Salmon River (South Fork Salmon River steelhead population), and Rapid River (Little Salmon River steelhead population).

In this report we also utilized data generated from intensive transect surveys to develop maps displaying the density and distribution of steelhead and Chinook Salmon in basins where rotary screw traps are operated (Figures 11-22). Resulting maps are at a population scale finer than extensive transects, which generally followed ICBTRT's (2003, 2005) steelhead population delineations.

Extensive

To evaluate the distribution and relative abundance of steelhead and Chinook Salmon within specific populations (Table 1), extensive panels were established to obtain occupancy and distribution information from key steelhead population and spawning aggregates as defined by the ICBTRT (2003, 2005). Extensive panel transects can be utilized for opportunistic events or for special data needs such as visiting watersheds with sparse data, providing recent data to inform future restoration or watershed status assessment, or to evaluate post fire conditions. Extensive panel transects were selected based on need and crew availability. In 2021, because higher prioritized Core and Intensive transects could not be surveyed early in the season due to snow conditions, some extensive transects in lower elevations were surveyed until conditions at prioritized sites improved. In 2021, extensive panel transects were conducted in O'Hara Creek (Selway River population), Peasley Creek (South Fork Clearwater River population), and Pete King Creek (Lochsa River population) in the Clearwater River basin and Basin Creek (Upper Salmon River population) and Panther Creek (Panther Creek population) in the Salmon River basin. Distribution maps were developed for these extensive transects (Figures 23-30).

Detection Probability Surveys (Mark-Resight)

To assess observation bias during snorkel surveys, field crews implemented a mark-resight methodology to estimate the observation or detection efficiency of steelhead parr and Westslope Cutthroat Trout in a subjectively chosen set of transects each year. A protocol modified from Thurow et al. (2006) was designed to estimate detection probability through observation of individuals marked with a caudal fin clip (Apperson et al. 2015). Since Thurow et al. (2006) found that steelhead and Westslope Cutthroat Trout had the same detection efficiency, we evaluate the observation efficiency of snorkeling for juvenile steelhead and Cutthroat Trout combined at a subset of transects. Mark-resight surveys are selected at the snorkel crew leader's discretion, based on time availability, ability to catch enough fish, and water conditions, but the program goal is to perform them in 10% of transects annually.

Detection probability was the number of marked fish observed in the 100 m target transect and the oversample reaches (50 m sections on the upstream and downstream side of the target transect) divided by number of fish marked. We assumed limited movement; however, we included all marked fish observed in the oversample reaches because movement of marked fish from the target reach biased the estimate downwards. Keeping marked fish from the oversample reaches in the calculation increases precision because each marked fish is treated as an independent trial: seen or not seen.

Analytical Methods

Densities for all species are expressed as number of fish/100 m^2 in each transect. Transect area where the entire stream width is surveyed is calculated by measuring a minimum of three wetted widths, including the transect start and end points, after surveying the transect. The average wetted width is then multiplied by the total length of the transect to calculate the transect area (Apperson et al. 2015).

Some transects are located in stream reaches that are not conducive to snorkeling the entire stream width due to excessive depth and/or velocity (Apperson et al. 2015). At such sites, the transect is surveyed by floating from the upstream boundary to the downstream boundary. These are called corridor surveys. Typically, corridor surveys are conducted using either a single snorkeler surveying the thalweg, or two snorkelers, one snorkeler for surveying each bank. Transect area for corridor surveys is based on the corridor visible to the observer as measured before the survey (Rich et al. 1990). This is accomplished by measuring the underwater visibility using the Secchi disk-like approach outlined in Apperson et al. 2015. The underwater visibility is then used to determine the snorkeler's left and/or right field of view to provide the visible corridor width measurement. For a single snorkeler, the transect area is calculated by multiplying the visible corridor width measurement by the transect length. For multiple snorkelers, the visible corridor width measurement is multiplied by the number of snorkelers. This total width is then multiplied by the transect length to calculate the transect area. Fishes are counted as they pass behind the snorkeler in the visible corridor.

Trend data since 2011 (not including 2020), including mean fish densities and standard deviations, for core transects in the Clearwater and Salmon river basins were reported, along with the most recent 5-year mean and standard deviation for comparison.

Occupancy of steelhead and Chinook Salmon was calculated for transects based on presence and absence. This metric refers to the proportion of transects in which a specific species was encountered in comparison to the total number of transects surveyed in that basin. Standard

deviation is calculated for occupancy by treating occupancy as a binomial random variable and multiplying the probability that a transect is occupied by the probability that it is not and dividing by the sample size. For the purposes of this report, it provides a metric that describes the amount of available habitat occupied by Chinook Salmon and steelhead.

$$SD = P(t_i=1) * P(t_i=0)^{-1}/n$$

Where $P(t_i=1)$ is the probability that a transect is occupied by the species of interest, $P(t_i=0)$ is the probability that a transect is not occupied by the species of interest, and n is the sample size.

Maps were made to visualize anadromous parr distribution and relative abundance of Chinook Salmon and steelhead. These maps were drafted using ArcMap 10.3 to display the distribution of intensive and extensive GRTS survey transects. Intensive surveys were performed in the Potlatch River, Fish Creek, and Crooked River in the Clearwater basin; and Rapid River, South Fork Salmon River, Marsh Creek, and North Fork Salmon River in the Salmon River basin. Extensive surveys were performed in O'Hara Creek, Peasley Creek, and Pete King Creek in the Clearwater basin; and in Basin Creek and Panther Creek in the Salmon basin. Graduated symbols were used to illustrate the densities. The densities were classified using defined intervals based on the distribution and range. The intervals are: 0.00, .001-2.49, 2.50-4.99, 5.00-9.99, 10.00-14.99, 15.00-19.99, 20.00-24.99 fish observed/100 m^2.

RESULTS

During 2021, a total of 528 snorkel surveys were completed. Twenty-four additional transects were not surveyed. Eight transects (1 non-core, 6 intensive, and 1 extensive) were not surveyed due to low or no water. Sixteen core transects were not visited due to wildfires. Detailed results for surveyed transects are expansive, and are therefore presented in the appendices (Appendix B for core trend transects, C for non-core trend and resident trend transects, D for intensive transects, and E for extensive transects). Density and distribution maps are provided for intensive and extensive snorkel surveys completed in 2021 (Figures 11-30).

Trend Surveys

Core

A total of 48 core trend transects were surveyed in the Clearwater River basin in 2021. Ten core transects were not surveyed in the upper Lochsa River basin because of wildfires. These included transects in Brushy Fork (2), Colt Creek (1), and Crooked Fork Creek (7). Mean steelhead density was 1.0 fish/100 m^2 (SD = 1.7; Figure 1; Appendix B1) and mean Chinook Salmon density was 4.2 fish/100 m^2 (SD = 14.0; Figure 2; Appendix B1). Mean steelhead density in 2021 was 84.4% of the five-year mean (2015-2019; 1.2 fish/100 m^2; SD = 2.4). Mean Chinook Salmon density was 124.0% of the 2015-2019 mean (3.4 fish/100 m^2; SD = 5.9). Steelhead occupancy was 0.7 and Chinook Salmon occupancy was 0.5 for Clearwater River basin core trend transects.

Mean Chinook Salmon density was 4.2 fish/100 m^2 for core trend transects in the Clearwater River basin during 2021. This was 124.0% of the 2015-2019 mean (3.4 fish/100 m^2). In 2018 and 2019, the mean Chinook Salmon densities were 0.3 fish/100 m^2 and 0.8 fish/100 m^2, respectively. These are low compared to the 2011-2017 mean of 4.3 fish/100 m^2 (range 2.3 fish/100 m^2 - 7.2 fish/100 m^2). Consequently, the 2021 Chinook Salmon density (4.2 fish/100 m^2)

for the Clearwater River basin transects aligns closely with the 2011-2017 mean of 4.3 fish/100 m^2.

A total of 89 core trend transects were surveyed in the Salmon River basin in 2021. Mean steelhead density was 1.8 fish/100 m^2 (SD = 4.0; Figure 1; Appendix B2) and mean Chinook Salmon density was 3.5 fish/100 m^2 (SD = 8.1; Figure 2; Appendix B2). Mean steelhead density in 2021 was 75.9% of the five-year mean (2015-2019; 2.4 fish/100 m^2; SD = 5.6). Mean Chinook Salmon density in 2021 was 77.4% of the five-year mean (4.5 fish/100 m^2; SD = 10.3). Steelhead occupancy was 0.7 and Chinook Salmon occupancy was 0.6 for Salmon River basin core trend transects.

A total of four core trend transects were surveyed in the Hells Canyon portion of the Snake River basin, Idaho in 2021. Mean steelhead density was 14.6 fish/100 m^2 (SD = 11.2; Appendix B3) and mean Chinook Salmon density was 3.5 fish/100 m^2 (SD = 6.8; Appendix B3). These transects were only surveyed four times between 2013 and 2018 (2013, 2014, 2015, 2018). Mean steelhead density in 2021 was 80.1% of the four-year mean (18.2 fish/100 m^2; SD = 3.6). Mean Chinook Salmon density in 2021 was 117.3% of the four year mean (3.0 fish/100 m^2; SD = 2.3). Steelhead occupancy was 1.0 and Chinook Salmon occupancy was 0.5 for Salmon River basin core trend transects.

The 2021 Hells Canyon portion of the Snake River basin mean Chinook Salmon density in 2021 was 117.3% of the four-year mean (3.0 fish/100 m^2; SD = 2.3). The 2014 density was 1.6 fish/100 m^2. This is relatively low compared to the mean of the other three years (2013, 2015, 2018) which was 3.5 fish/100 m^2 (range 3.3-3.7). Consequently, the 2021 Chinook Salmon density (3.5 fish/100 m^2) for the Hells Canyon portion of the Snake River basin transects aligns with the three-year mean of 3.5 fish/100 m^2.

Non-core and Resident

In the Clearwater River basin, eight non-core trend transects were surveyed during 2021 (Appendix C1). Mean steelhead density was 0.6 fish/100 m^2 (SD = 1.0) and occupancy was 0.6. Chinook Salmon were not observed in any Clearwater River basin non-core transects in 2021.

In the Salmon River basin, 26 non-core trend transects were surveyed during 2021 (Appendix C2). Mean steelhead density was 4.8 fish/100 m^2 (SD = 1.1) and mean Chinook Salmon density was 0.9 fish/100 m^2 (SD = 0.6). Steelhead occupancy was 0.8 and Chinook Salmon occupancy was 0.4 for Salmon River basin non-core trend transects.

A total of 36 resident trend transects were surveyed in 2021: six transects in the Clearwater River basin (Appendix C3) and 30 in the Salmon River basin (Appendix C4). In the Clearwater River basin, mean steelhead density was 1.7 fish/100 m^2 (SD = 1.4) and mean Chinook Salmon density was 1.6 fish/100 m^2 (SD = 3.3). In the Salmon River basin, mean steelhead density was 0.7 fish/100 m^2 (SD = 1.0) and mean Chinook Salmon density was 1.6 fish/100 m^2 (SD = 3.8). Steelhead occupancy was 0.8 and Chinook Salmon occupancy was 0.5 for Clearwater River basin resident trend transects. In the Salmon River basin, steelhead occupancy was 0.8 and Chinook Salmon occupancy was 0.4.

Probabilistic Surveys (GRTS)

Intensive

In the Potlatch River basin, 64 intensive GRTS transects were surveyed (Appendix D1; Figure 11). Mean steelhead density in these transects was 1.2 fish/100 m^2 (SD = 2.3; Figures 3 and 4; Appendix D1) with an occupancy of 0.5. Chinook Salmon were not observed in the Potlatch River basin in 2021.

In the Fish Creek basin, 21 intensive GRTS transects were surveyed (Appendix D2; Figure 12). Mean steelhead density was 1.8 fish/100 m^2 (SD = 2.0), with an occupancy of 0.8; Figures 3 and 4). Mean Chinook Salmon density was <0.1 fish/100 m^2 (SD = <0.1), with an occupancy of <0.1 (Figures 3 and 4).

In the Crooked River basin, 19 intensive GRTS transects were surveyed during 2021 (Appendix D3; Figures 13 and 14). Mean steelhead density was 0.2 fish/100 m^2 (SD = 0.5), with an occupancy of 0.3. Mean Chinook Salmon density was <0.1 fish/100 m^2 (SD 0.1) with an occupancy of 0.1. Chinook Salmon were observed in only two intensive GRTS transects in Crooked River for the Clearwater River basin in 2021 (Figures 3 and 4).

In the Rapid River basin, 20 intensive GRTS transects were surveyed (Appendix D4; Figures 15 and 16). Mean steelhead density was 2.3 fish/100 m^2 (SD = 2.7) with an occupancy of 0.7. Mean Chinook Salmon density was 0.2 fish/100 m^2 (SD = 0.3) with an occupancy of 0.3 (Figures 5 and 6).

In the South Fork Salmon River basin, 29 intensive GRTS transects were surveyed (Appendix D5; Figures 17 and 18). Mean steelhead density was 2.0 fish/100 m^2 (SD = 3.0) with an occupancy of 0.8. Mean Chinook Salmon density was 1.4 fish/100 m^2 (SD = 4.0) with an occupancy of 0.5 (Figures 5 and 6).

In the North Fork Salmon River basin, 29 intensive GRTS transects were surveyed (Appendix D6; Figures 19 and 20). Mean steelhead density was 2.7 fish/100 m^2 (SD = 3.7) with an occupancy of 0.7. Mean Chinook Salmon density was <0.1 fish/100 m^2 (SD = 0.1) with an occupancy of 0.1 (Figures 5 and 6).

In the Marsh Creek basin, 23 intensive GRTS transects were surveyed (Appendix D7; Figures 21 and 22). Mean steelhead density was 0.2 fish/100 m^2 (SD = 0.3) with an occupancy of 0.4. Mean Chinook Salmon density was 2.8 fish/100 m^2 (SD = 5.2) with an occupancy of 0.6 (Figure 5 and 6).

Extensive

Three creeks were surveyed in the Clearwater River basin: Pete King Creek, O'Hara Creek, and Peasley Creek. Two creeks were surveyed in the Salmon River basin: Panther Creek and Basin Creek.

In the Pete King Creek basin, 29 extensive GRTS transects were surveyed (Appendix E1; Figure 23). Mean steelhead density was 0.6 fish/100 m^2 (SD = 1.0) with an occupancy of 0.4. No Chinook Salmon were observed (Figures 7 and 8).

In the O'Hara Creek basin, 24 extensive GRTS transects were surveyed (Appendix E2; Figures 24 and 25). Mean steelhead density was 1.8 fish/100 m^2 (SD = 2.4) with an occupancy of 0.5. Mean Chinook Salmon density was 0.6 fish/100 m^2 (SD = 1.3) with an occupancy of 0.3 (Figures 7 and 8).

In Peasley Creek basin, 15 extensive GRTS transects were surveyed (Appendix E3; Figure 26). Mean steelhead density was 3.1 fish/100 m^2 (SD = 2.9) with an occupancy of 0.7. No Chinook Salmon were observed (Figures 7 and 8).

In the Panther Creek basin, 22 extensive GRTS transects were surveyed (Appendix E4; Figures 27 and 28). Mean steelhead density was 1.7 fish/100 m^2 (SD = 1.7) with an occupancy of 0.8. Mean Chinook Salmon density was 1.0 fish/100 m^2 (SD = 1.9) with an occupancy of 0.5 (Figures 9 and 10).

In the Basin Creek basin, 22 extensive GRTS transects were surveyed (Appendix E5; Figures 29 and 30). Mean steelhead density was 2.3 fish/100 m^2 (SD = 2.2) with an occupancy of 1.0. Mean Chinook Salmon density was 0.7 fish/100 m^2 (SD = 1.1) with an occupancy of 0.5 (Figures 9 and 10).

Detection Probability Surveys (Mark-Resight)

In 2021, we conducted mark-resight studies at 17 transects to assess detection probability for steelhead. Crews marked 399 fish (331 steelhead and 68 Westslope Cutthroat Trout) and detected 152 of the marked fish. Transect detection probabilities in 2021 varied from 4% to 58% with a mean of 38% (SD = 16.0; Table 3). This is similar to the 5-year mean (37.6%) for 2015-2019.

DISCUSSION

In 2020, the COVID-19 pandemic raised concerns for safety of field crews. Therefore, most of the snorkel efforts for 2020 were cancelled and few surveys were completed. A primary goal in 2021 was to survey transects that were not surveyed in 2020. Although not all the sites were visited in 2021, 528 of 552 sites were completed. Conditions in Idaho in 2021 were very hot and dry. Consequently, 24 transects were either visited and not surveyed (eight) due to low or no water or cancelled (16) due to fire danger. Low water levels made planning the season easier due to needing less personnel to complete transects. Many snorkel transects that would normally be delayed until later in the season due to high flows or snow conditions were more easily surveyed earlier in the season and made scheduling less difficult. Efforts to survey the transects that were not completed in 2020 due to COVID-19 restrictions, wildfires and low water during 2021 will continue during 2022.

The 2021 survey transects were selected based on the Idaho Anadromous Parr Monitoring 2020 Annual Report (Poole et al. 2020), Appendices A1-A3 survey schedules. Transects for 2022 are based upon Appendices A1-A3 survey schedules in this report. This appendix will contain the transects not completed in 2020 and 2021 such as those in the upper Lochsa River basin that were not surveyed in 2021 due to wildfires.

Snorkel survey data are used for many purposes, ranging from reporting spatial distribution of salmonids for ESA status reviews (Copeland et al. 2015, Poole et al 2020) to assessing how new roadways or mining activities may affect threatened populations. This dataset,

especially the core and intensive GRTS surveys, is the most spatially and temporally robust information on salmonid distribution and abundance in Idaho and surveys should continue. However, it is important to acknowledge limitations in these data so users can better assess how data should appropriately be used. Core snorkel transects address trends in the population; however, where sightability remains unknown, fish densities should be viewed as minimum density within a transect (as opposed to an absolute density). It is appropriate to compare prior years to assess fluctuation over time, or to visualize parr on the landscape, but not appropriate to extrapolate fish populations beyond the surveyed transect.

Intensive survey panels were established to determine if a relationship exists between juvenile densities from snorkeling and emigration abundance upstream of rotary screw traps. Intensive panels were first established in 2007 in Marsh Creek, Fish Creek, and Rapid River. Crooked Fork (Lochsa River tributary), Big Bear Creek, and the East Fork Potlatch River were then added in 2008. However, the Crooked Fork trap was pulled and intensive surveys were discontinued in that basin in 2014. Intensive panels have since been established in the South Fork Salmon River upstream from the Krassel Creek PIT-tag array and rotary screw trap in 2015, and in the North Fork Salmon River, upstream of the rotary screw trap and PIT-tag array in 2016.

The relationship between juvenile densities from snorkeling and emigration abundance estimates from screw traps was investigated by Poole et al. (2021). The linear model indicated that the parr density observed in our snorkel surveys, along with trap site, explained 76.4% of the variation observed in steelhead emigrant abundance estimated from rotary screw traps. This demonstrated that observed density of steelhead from snorkel surveys is highly predictive of steelhead emigrant abundance at the associated rotary screw trap during the following migration period.

Extensive panels were established to obtain occupancy and distribution information from key steelhead population and spawning aggregates as defined by the ICBTRT (2003, 2005). Occupancy from extensive panel surveys helps to evaluate spatial distribution of steelhead and Chinook Salmon within specific populations (Table 1). Extensive panel transects provide additional sites that can be surveyed if winter conditions delays access to high priority sites, can be used to inform future restoration actions, evaluate post fire conditions and effects on fish distribution, and evaluate extent of critical habitat for listed species.

The Pete King, O'Hara, and Peasley creek basins were not the focus for snorkel surveys before 2021. However, one transect within the Pete King Creek basin and six transects within the O'Hara Creek basin were included during larger scale surveys in recent years. The US Forest Service is proposing a large prescribed fire and timber removal project in the Pete King Creek drainage with a goal of improving elk habitat. Very little data on fish species presence and distribution were available for Pete King Creek. One transect in Pete King Creek was surveyed as part of a larger Lochsa River drainage extensive survey in 2015 (Belnap et al. 2015). Extensive panel surveys were chosen and conducted in 2021 to provide the best most recent information on pre-treatment species composition and distribution of fish that can be used to inform this project in the planning process. These data can also be used to evaluate a post-treatment response. O'Hara Creek is another system with little recent available data on fish species presence and distribution. Four transects were surveyed as part of a larger Selway River drainage extensive survey in 2009 (Kennedy et al. 2011). Two more transects were surveyed in 2011 (Kennedy et al. 2012) as part of the Selway River drainage extensive survey. Peasley Creek is a tributary to the South Fork Clearwater River. It too has very little recent data available. A search for Peasley Creek in the Idaho Fish and Wildlife Information System Idaho Lake & Stream Survey database (https://idfg.idaho.gov/ifwis/fishsurvey) returned no snorkel survey data prior to 2021.

Unlike most extensive surveys conducted in the Clearwater River basin in 2021, recently conducted extensive surveys in Basin and Panther creeks in the Salmon River basin can be compared to surveys conducted in 2021. Prior to 2021, extensive surveys (23 transects) were conducted in the Basin Creek drainage in 2017 (Putnam et al. 2018). Mean steelhead trout density for all transects surveyed was up slightly in 2021 (2.3 fish/100 m^2 compared to 1.3 fish/100 m^2 in 2017). Mean Chinook Salmon density for all transects surveyed was the same at 0.7 fish/100 m^2 for 2021 and 2017. An increase in steelhead trout density was also observed in Panther Creek. Extensive surveys were conducted in the Panther Creek drainage during 2011 (Kennedy et al. 2012) as part of a larger extensive panel survey between Panther Creek and the North Fork Salmon River. Forty-three transects were snorkeled during 2019 (Poole et al. 2020) for a dedicated Panther Creek extensive panel survey. A subset of 22 transects, from the 2019 extensive survey, were resurveyed in 2021. The mean steelhead trout density for all transects surveyed was 3.0 fish/100 m^2 in 2019 and 1.7 fish/100 m^2 in 2021. The mean Chinook Salmon density for all transects surveyed was 1.1 fish/100 m^2 in 2019 and 1.0 fish/100 m^2 in 2021.

Occupancy and density information are useful for programs prioritizing habitat restoration projects for Columbia basin anadromous fish. For example, in the East Fork Potlatch River, maps have shown a gradient of steelhead densities, with greater densities and occupancy higher in the watershed. This has led to prioritizing habitat restoration work in the lower East Fork Potlatch River watershed, with the goal of restoring densities to that of the upper reaches (Potlatch Implementation Group 2019).

The error associated with snorkel data can be greatly influenced by transect-, year-, and crew-specific factors affecting sightability of fish. Although influences on resight efficiency have not been thoroughly investigated, Roth et al. (2019) recommended that crews conduct mark-resights during a similar time of year at the same locations each year, attempt to conduct a greater number of resights each year and spread resight surveys throughout the season to account for varying water levels and a crews' experience. These recommendations were implemented in 2021, with a goal of conducting 10 mark-resights per crew. However, no crew was able to achieve 10 mark-resights within the snorkel season and some resights were conducted with as low as 12 fish being marked.

As adult steelhead returns have continued to decline in recent years, crews have struggled to capture and mark enough fish in resight surveys. Low sample sizes could lead to major changes in sightability based on seeing or not seeing a single fish and have a large potential for error. In light of even lower juvenile abundances, we must find creative ways to obtain quality resight data, possibly at the cost of fewer resight transects. In the future, crews should only conduct resights if they can capture and mark at least 15 fish; however, marking 30 fish was the guidance in the past and crews should capture that many if possible. Cutthroat trout are also included in the marked sample with steelhead to increase the sample size. Second, in order to spread resights across the landscape, no more than five resights should be conducted on the same river. Additionally, more resources should be allocated to conducting resights and analyzing sightability in the future.

Among our current snorkel transect types (core, non-core and resident, intensive, and extensive), the core snorkel transects provide our longest, most consistent data series to track fish density and occupancy changes over time. Steelhead densities in core transects are currently stable but remain low in the Clearwater and Salmon river basins. Chinook Salmon densities in core transects are low also. However, their densities have steadily increased slightly during the past three years in both basins. Snorkel surveys are a useful tool to track relative density and

occupancy at a landscape scale over time. Routine snorkel surveys of core transects will allow us to continue to monitor density and occupancy trends.

RECOMMENDATIONS

1. Maintain long-term time series of both core and intensive GRTS surveys.

2. Continue to analyze the relationship between production of juvenile emigrants estimated from screw traps and parr densities from GRTS intensive snorkel surveys for each of the seven target basins.

3. Provide information for ESA status reviews and help visualize fish on the landscape, create distribution maps based on extensive panels to describe the spatial structure of steelhead, Chinook Salmon, and other salmonids in Idaho, and specifically for steelhead, analyze and report distribution and density of parr by major and minor spawning aggregations (MSAs).

4. Continue to conduct mark-resight surveys in addition to standard snorkel surveys.

5. Continue assessing the factors that influence sightability and incorporate results into mark-resight design.

6. Continue preseason planning with all four regionally based anadromous snorkel crews. Continue the annual crew training exercise in the Potlatch River drainage at the beginning of the field season.

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ACKNOWLEDGEMENTS

We are grateful to the Bonneville Power Administration and Russell Scranton, our contracting officer's technical representative, for support and funding of this work through project number 1990-055-00. Surveys in the Middle Fork Salmon River and the Selway River watersheds were funded by grant F15AF00829 under the Dingell-Johnson Act. Electronic data entry materials and development was provided through StreamNet. Tony Lamansky assisted with managing and organizing snorkel data and databases. As always, the snorkel report is fueled by our field crews. We would like to thank everyone who has spent time hiking to transects, snorkeling, and searching for waypoints. This report benefited from reviews by Tim Copeland and Marika Dobos. Cheryl Leben helped format and edit the document.

TABLES

Table 1. Major population groups and independent populations within the Snake River steelhead distinct population segment (DPS) (ESU; ICBTRT 2003, 2005, 2009 Ford 2011, 2015; NMFS 2011, 2016).

Snake River Steelhead DPS	
Major population group	**Population name**
Lower Snake River	1. Tucannon River 2. Asotin Creek
Grande Ronde River	3. Lower Grande Ronde River 4. Joseph Creek 5. Wallowa River 6. Upper Grande Ronde River
Imnaha River	7. Imnaha River
Clearwater River	8. Lower Clearwater River 9. North Fork Clearwater River (extirpated) 10. Lolo Creek 11. Lochsa River 12. Selway River 13. South Fork Clearwater River
Salmon River	14. Little Salmon and Rapid Rivers 15. Chamberlain Creek 16. South Fork Salmon River 17. Secesh River 18. Panther Creek 19. Lower Middle Fork Salmon River 20. Upper Middle Fork Salmon River 21. North Fork Salmon River 22. Lemhi River 23. Pahsimeroi River 24. East Fork Salmon River 25. Upper Salmon River
Hells Canyon Tributaries (extirpated) [a]	

[a] Reintroduced fish may exist in some extirpated areas except the North Fork Clearwater River.

Table 2. Major population groups and independent populations within the Snake River spring-summer Chinook Salmon evolutionary significant unit (ESU; ICBTRT 2003, 2005, 2009 Ford 2011, 2015; NMFS 2011, 2016).

Snake River spring-summer Chinook Salmon ESU	
Major population group	Population name
Lower Snake River	1. Tucannon River
	2. Asotin Creek (extirpated) [a]
Grande Ronde/Imnaha Rivers	3. Wenaha River
	4. Lostine River
	5. Minam River
	6. Catherine Creek
	7. Upper Grande Ronde River
	8. Imnaha River
	9. Big Sheep Creek (extirpated) [a]
	10. Lookingglass Creek (extirpated) [a]
South Fork Salmon River	11. Little Salmon River
	12. South Fork Salmon River Mainstem
	13. Secesh River
	14. East Fork South Fork Salmon River
Middle Fork Salmon River	15. Chamberlain Creek
	16. Middle Fork Salmon River below Indian Creek
	17. Big Creek
	18. Camas Creek
	19. Loon Creek
	20. Middle Fork Salmon River above and including Indian Creek
	21. Sulphur Creek
	22. Bear Valley Creek
	23. Marsh Creek
Upper Salmon River	24. Panther Creek (extirpated) [a]
	25. North Fork Salmon River
	26. Lemhi River
	27. Salmon River Lower Mainstem below Redfish Lake
	28. Pahsimeroi River
	29. East Fork Salmon River
	30. Yankee Fork Salmon River
	31. Valley Creek
	32. Salmon River Upper Mainstem above Redfish Lake
Dry Clearwater River (extirpated) [a]	33. Potlatch River (extirpated) [a]
	34. Lapwai Creek (extirpated) [a]
	35. Lawyer Creek (extirpated) [a]
	36. Upper South Fork Clearwater River (extirpated) [a]
Wet Clearwater River (extirpated) [a]	37. Lower North Fork Clearwater River (extirpated)
	38. Upper North Fork Clearwater River (extirpated)
	39. Lolo Creek (extirpated) [a]
	40. Lochsa River (extirpated) [a]
	41. Meadow Creek (extirpated) [a]
	42. Moose Creek (extirpated) [a]
	43. Upper Selway River (extirpated) [a]

[a] Reintroduced fish may exist in some extirpated areas except the North Fork Clearwater River.

Table 3. Mark-resight snorkel surveys completed in 2021. Marked steelhead and juvenile Westslope Cutthroat Trout were included in the counts. An asterisk denotes surveys that included Cutthroat Trout.

Stream	Transect name	Habitat type	Number of marked fish	Number of marked fish observed	Percent of marked fish observed	visibility (m)	Water temperature (°C)
East Fork South Fork Salmon River	Resight 3	riffle/pocket water/run/pool	31*	18	58%	2.8	11.7
Fish Creek	1	pocket water	31*	13	42%	3.1	21.0
Fish Creek	2	pocket water/pool	25*	13	52%	3.4	18.0
Fish Creek	12994	pocket water/riffle	17*	4	24%	2.1	20.0
Fish Creek	41666	pocket water/pool	30*	17	57%	3.8	21.0
Fish Creek	74434	pocket water	30*	16	53%	2.2	NA
Hazard Creek	Resight 2	pocket water/pool/run	29*	14	48%	2.7	17.5
Johns Creek	2>3	riffle/run/pocket water	23*	9	39%	1.4	11.0
Lick Creek	Resight 1	pocket water/pool	26*	13	50%	3.1	15.1
Newsome Creek	Flying Fish Hole	riffle/run/pocket water	19*	5	26%	1.4	21.5
O'Hara Creek	235298	pocket water/riffle	26*	1	4%	0.5	19.5
O'Hara Creek	99>2	run/pocket water/riffle	29*	7	24%	1.3	15.1
Old Man Creek	Grega	pocket water	23*	4	17%	2.1	14.1
Post Office Creek	Above Bridge	run/riffle/pocket water	12*	5	42%	1.4	9.1
Rapid River	193426	riffle/run	15	4	27%	2.9	12.5
Rapid River	Hanging Rock	run/pocket water	14	6	43%	2.3	16.0
Slate Creek	99>4	pocket water/pool/riffle	19	3	16%	1.8	17.1
Total			**399**	**152**	**38%**		

FIGURES

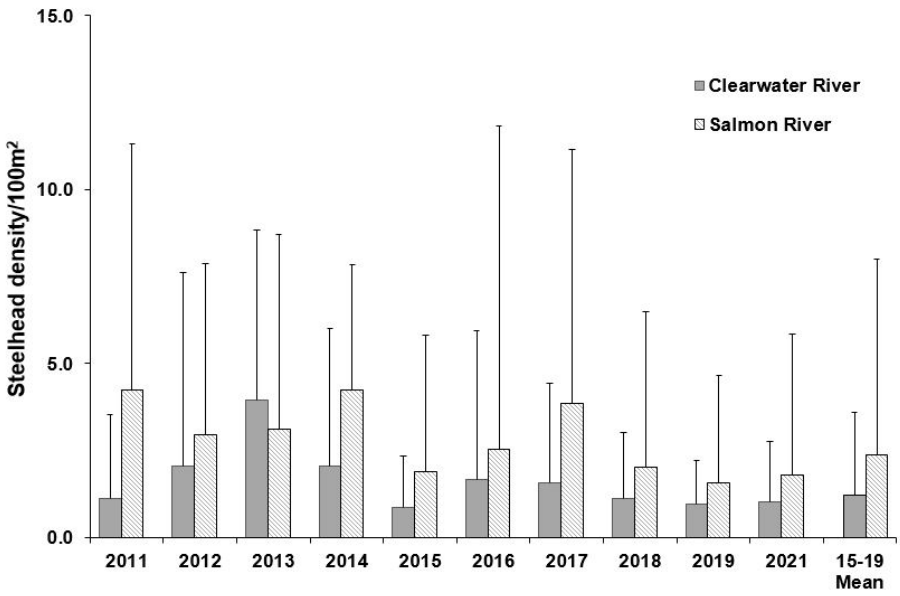

Figure 1. Mean steelhead densities (number per 100 m^2) observed during 2011-2021 in core trend snorkel survey transects in the Clearwater and Salmon river basins, Idaho. The 15-19 mean values are based upon densities over the previous five-year period (2015-2019). Error bars represent standard deviation.

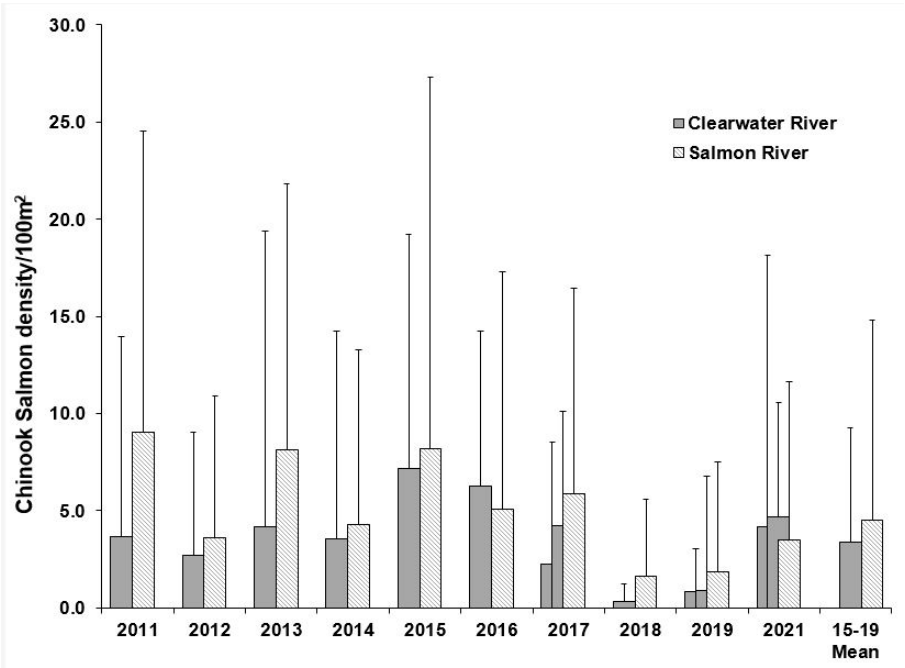

Figure 2. Mean Chinook Salmon densities (number per 100 m^2) observed during 2011-2021 in core trend snorkel survey transects in the Clearwater and Salmon river basins, Idaho. The 15-19 mean values are based upon densities over the previous five-year period (2015-2019). Error bars represent standard deviation.

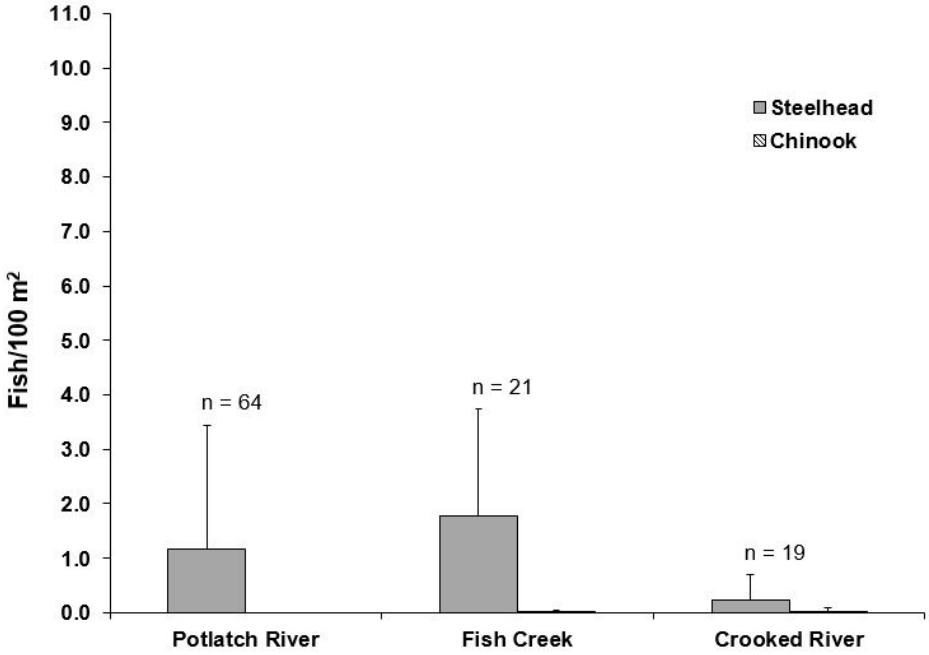

Figure 3. Mean densities of steelhead and Chinook Salmon per 100 m^2 observed during 2021 snorkel surveys at intensive transects in the Clearwater River basin, Idaho. Error bars represent standard deviation. No Chinook Salmon were observed in the Potlatch River. “n” is the number of transects surveyed.

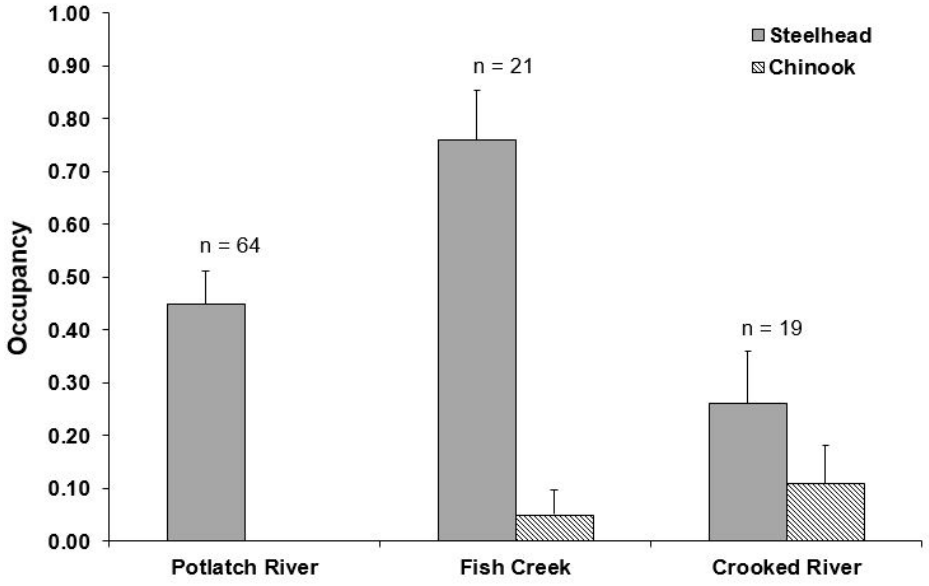

Figure 4. Occupancy rates of steelhead and Chinook Salmon observed during 2021 snorkel surveys at intensive transects in the Clearwater River basin, Idaho. Error bars represent standard deviation. No Chinook Salmon were observed in the Potlatch River. “n” is the number of transects surveyed.

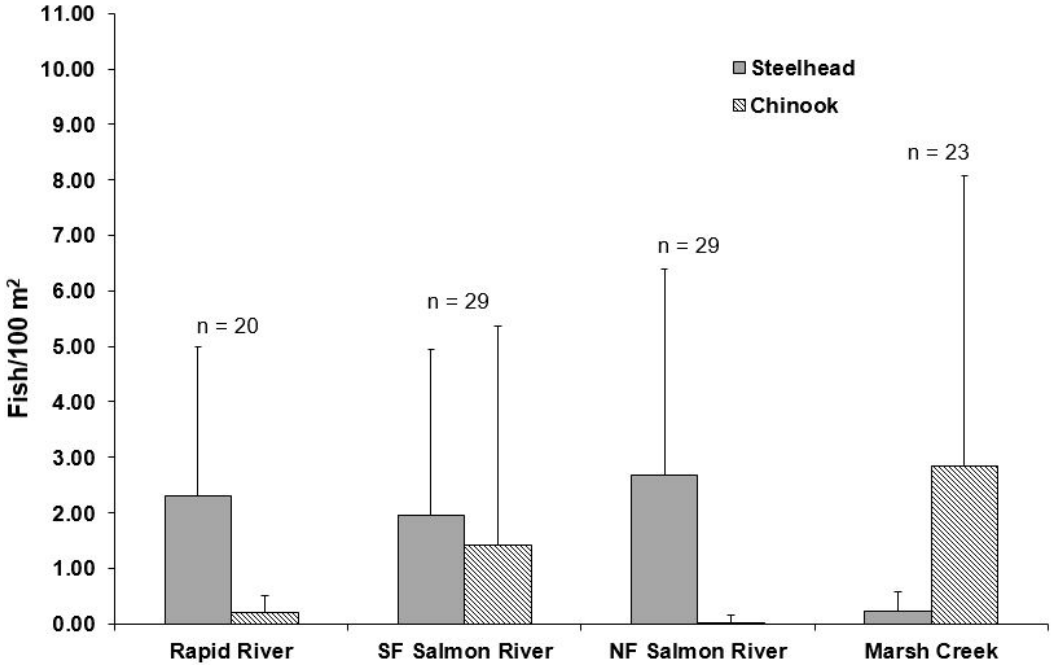

Figure 5. Mean densities of steelhead and Chinook Salmon per 100 m^2 observed during 2021 snorkel surveys at intensive transects in the Salmon River basin, Idaho. Error bars represent standard deviation. "n" is the number of transects surveyed.

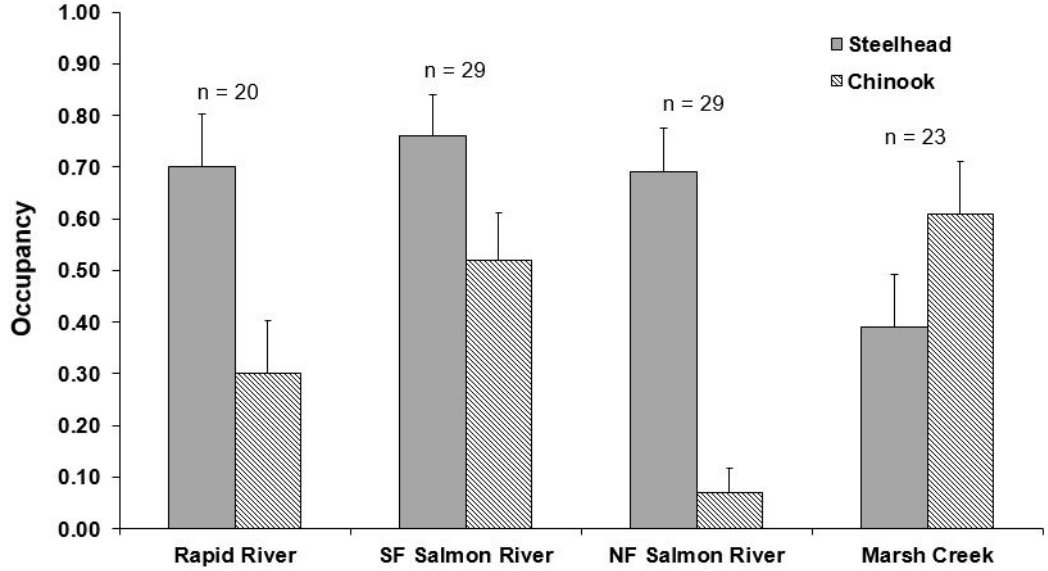

Figure 6. Occupancy rates of steelhead and Chinook Salmon observed during 2021 snorkel surveys at intensive transects in the Salmon River basin, Idaho. Error bars represent standard deviation. "n" is the number of transects surveyed.

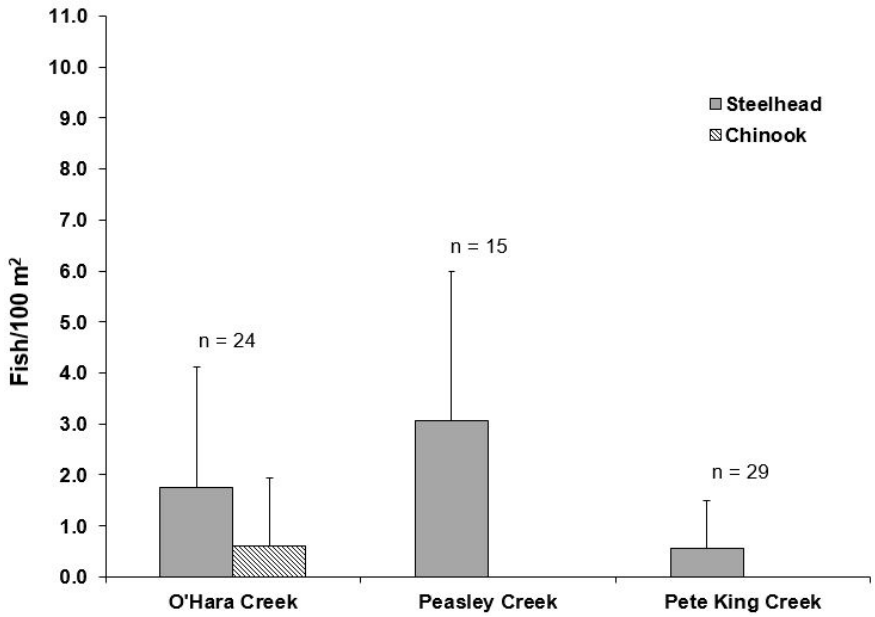

Figure 7. Mean densities of steelhead and Chinook Salmon per 100 m^2 observed during 2021 snorkel surveys at extensive transects in the Clearwater River basin. Error bars represent standard deviation. “n” is the number of transects surveyed. No Chinook Salmon were observed in Peasley or Pete King creeks.

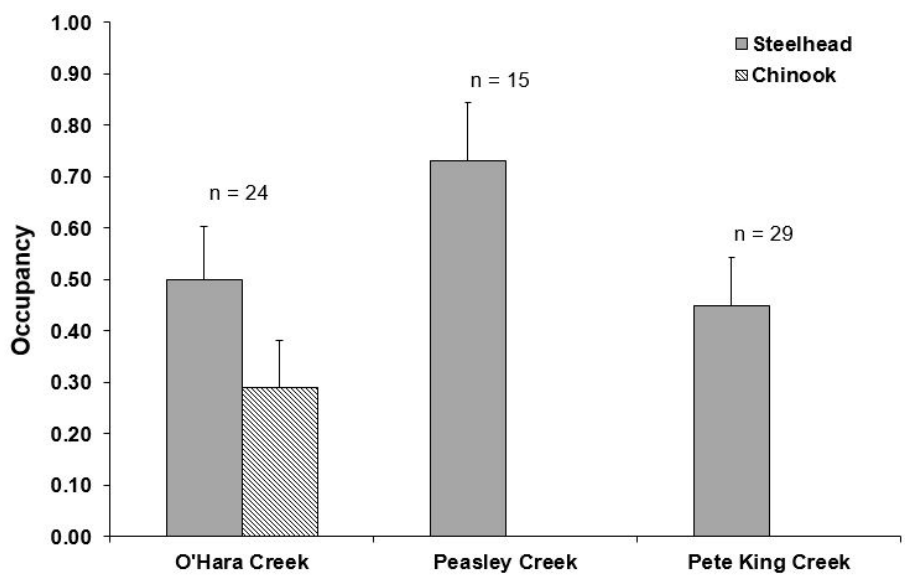

Figure 8. Occupancy rates of steelhead and Chinook Salmon observed during 2021 snorkel surveys at extensive transects in the Clearwater River basin. Error bars represent standard deviation. “n” is the number of transects surveyed. No Chinook Salmon were observed in Peasley or Pete King creeks.

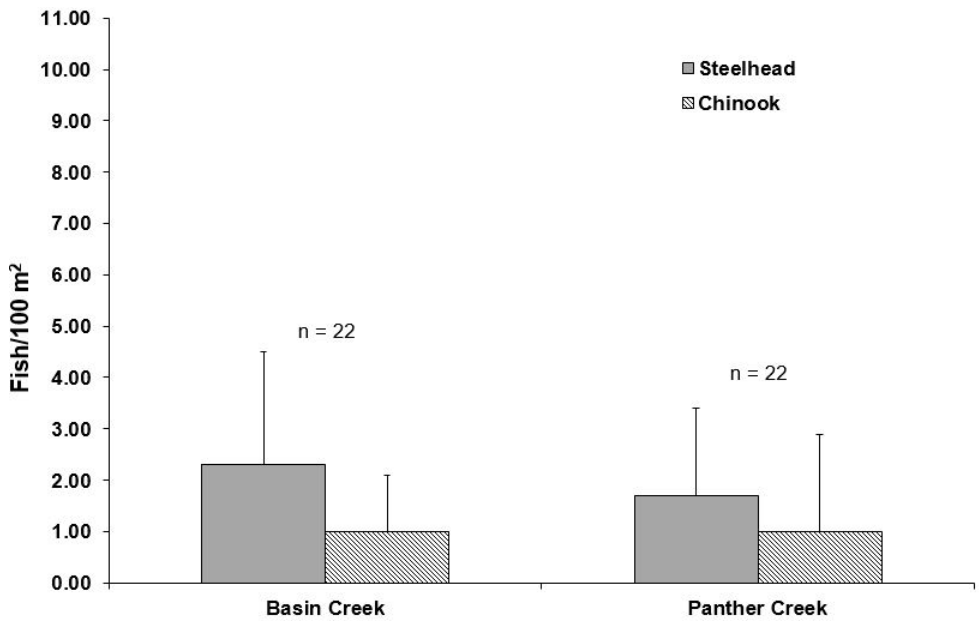

Figure 9. Mean densities of steelhead and Chinook Salmon per 100 m^2 observed during 2021 snorkel surveys at extensive transects in the Salmon River basin. Error bars represent standard deviation. “n” is the number of transects surveyed.

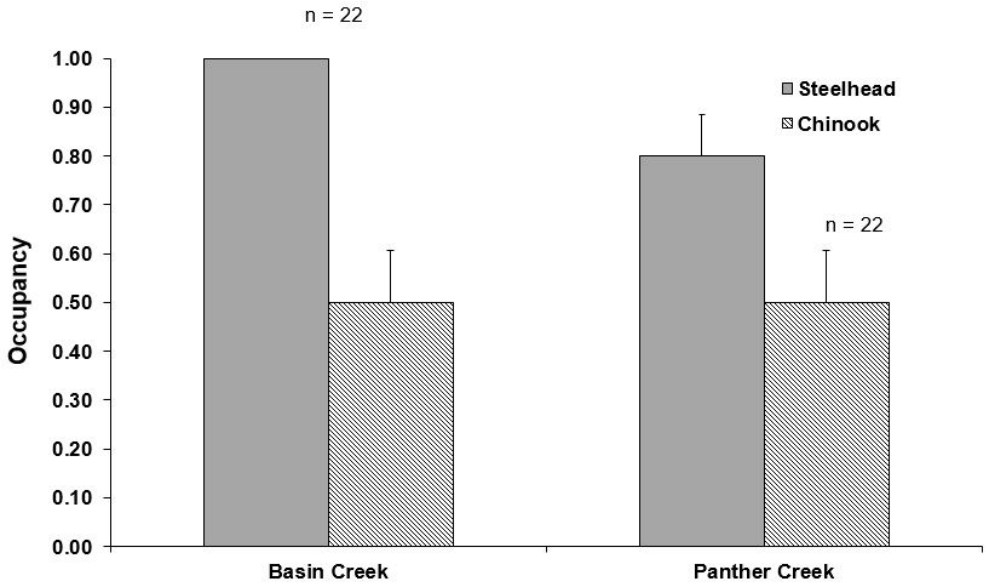

Figure 10. Occupancy rates of steelhead and Chinook Salmon observed during 2021 snorkel surveys at extensive transects in the Salmon River basin. Error bars represent standard deviation. “n” is the number of transects surveyed.

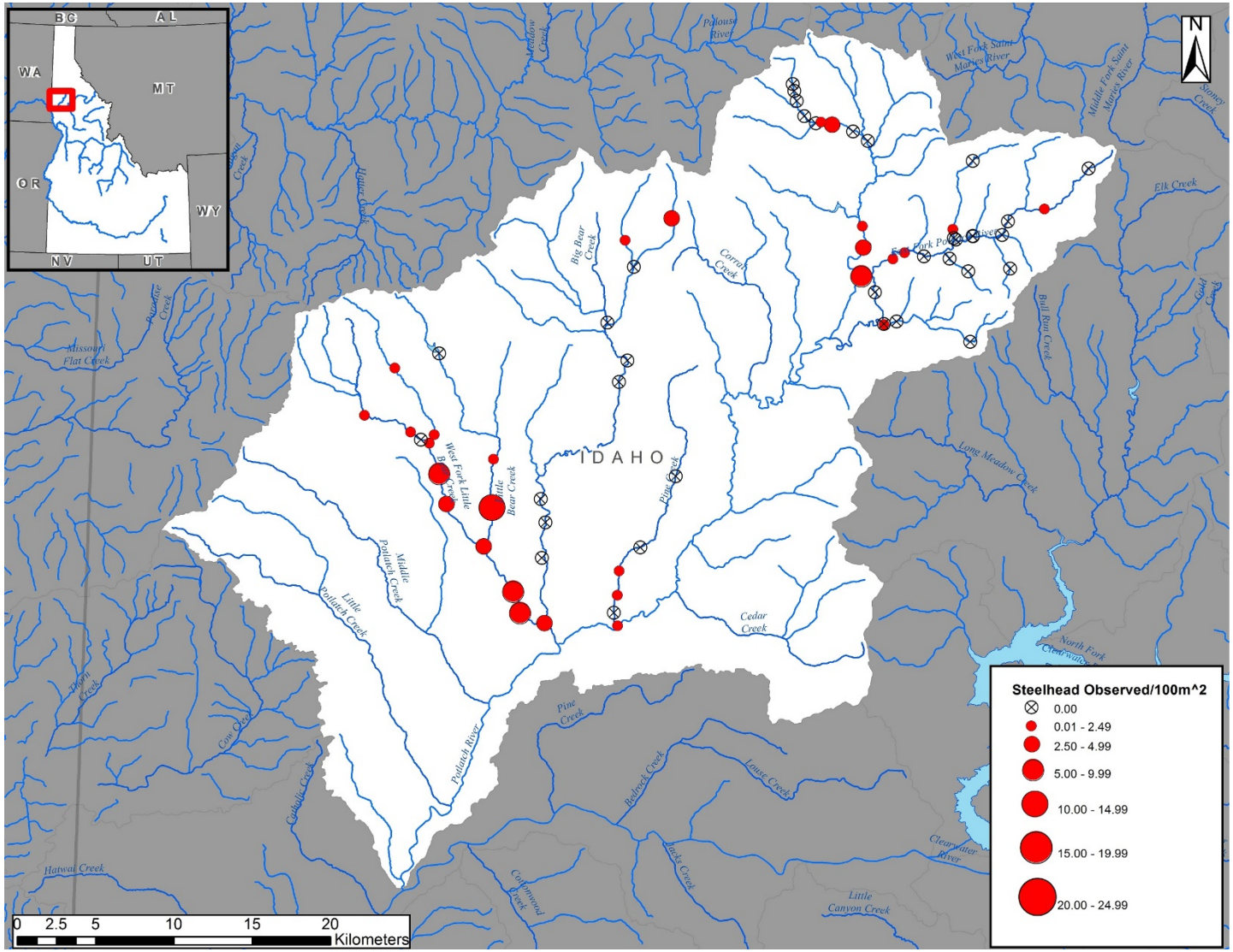

Figure 11. Map displaying the densities and distribution of steelhead observed in 2021 throughout the Potlatch River (Clearwater River basin), Idaho, during intensive GRTS snorkel surveys.

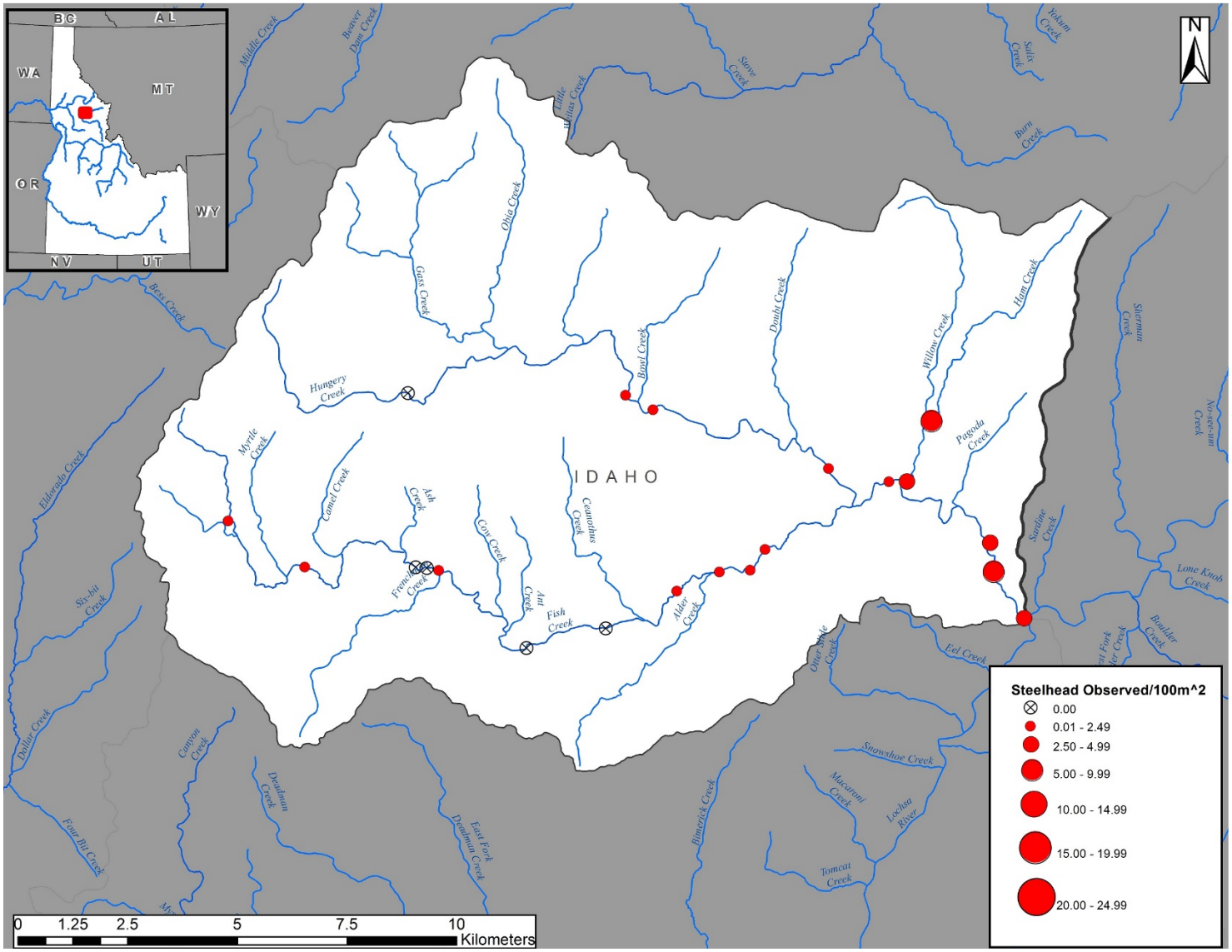

Figure 12. Map displaying the densities and distribution of steelhead observed in 2021 throughout the Fish Creek (Clearwater River basin), Idaho, during intensive GRTS snorkel surveys.

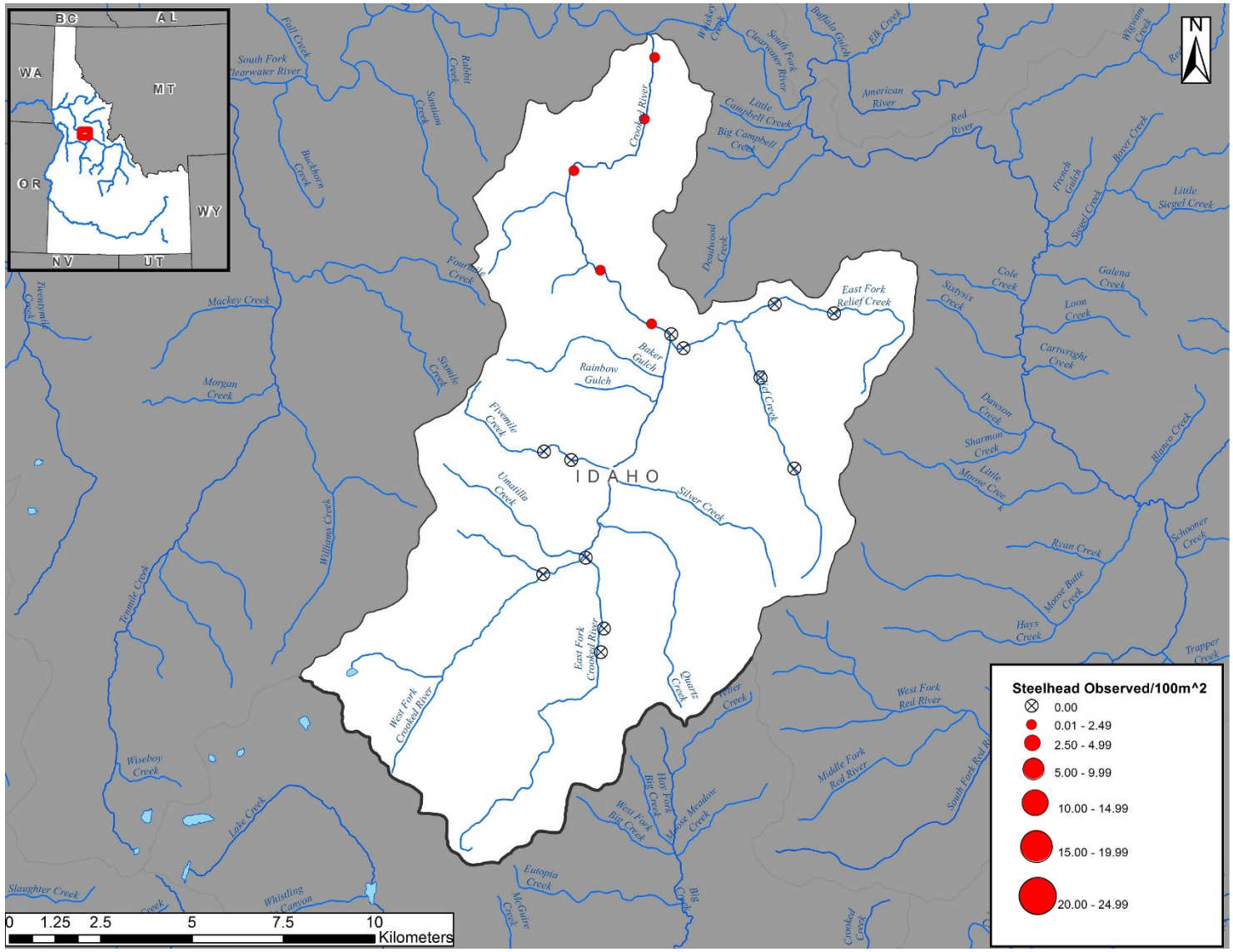

Figure 13. Map displaying the densities and distribution of steelhead observed in 2021 throughout Crooked River (Clearwater River basin), Idaho, during intensive GRTS snorkel surveys.

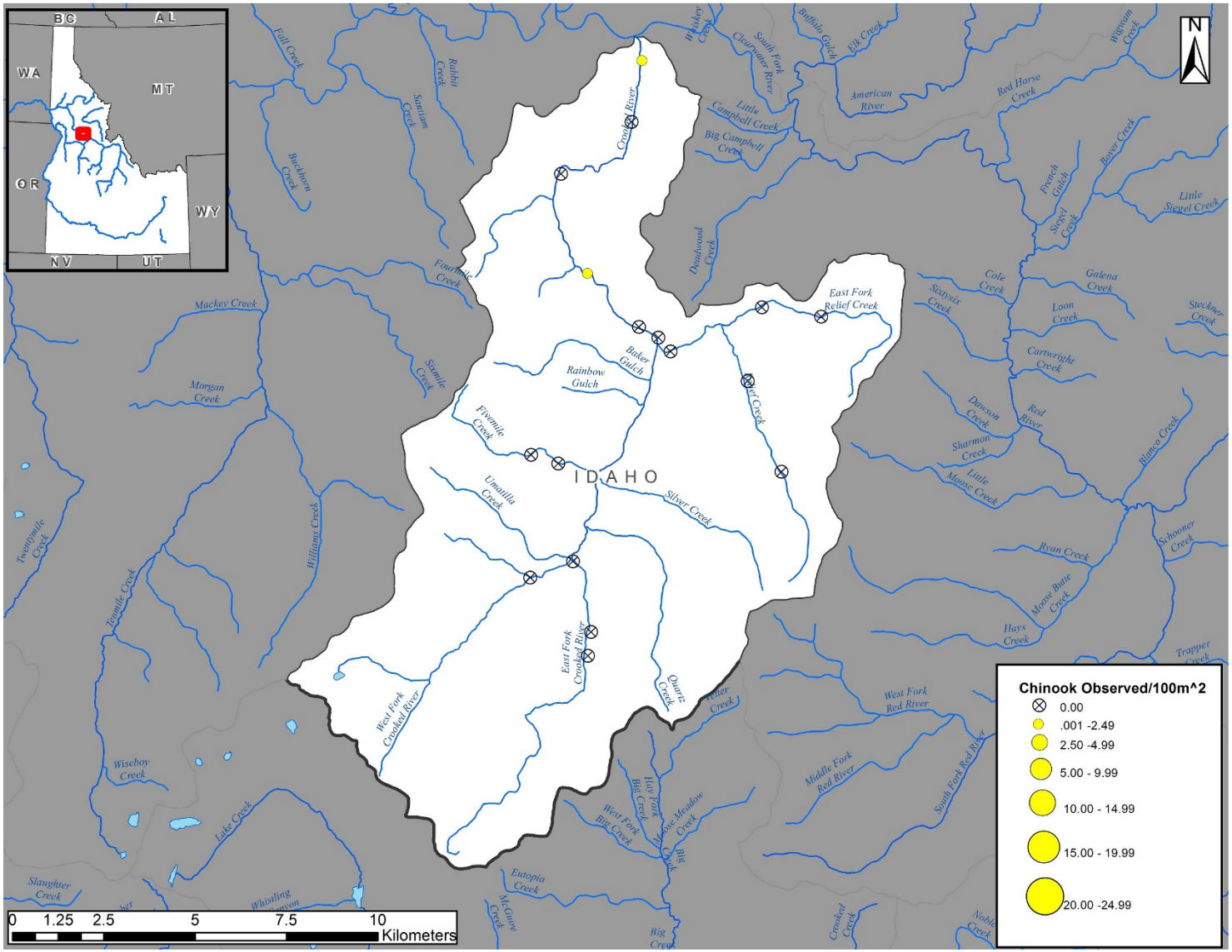

Figure 14. Map displaying the densities and distribution of Chinook Salmon observed in 2021 throughout Crooked River (Clearwater River basin), Idaho, during intensive GRTS snorkel surveys.

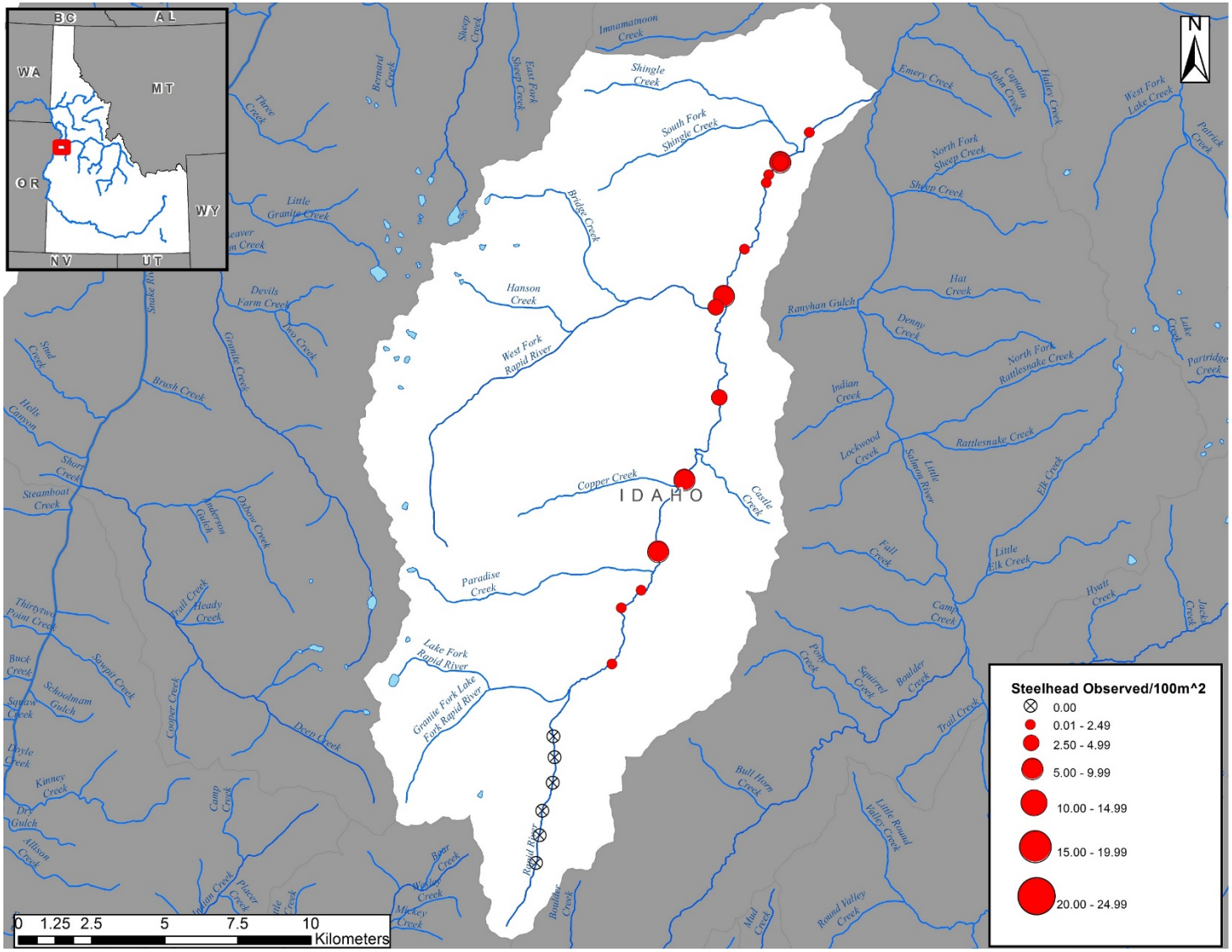

Figure 15. Map displaying the densities and distribution of steelhead observed in 2021 throughout Rapid River (Salmon River basin), Idaho, during intensive GRTS snorkel surveys.

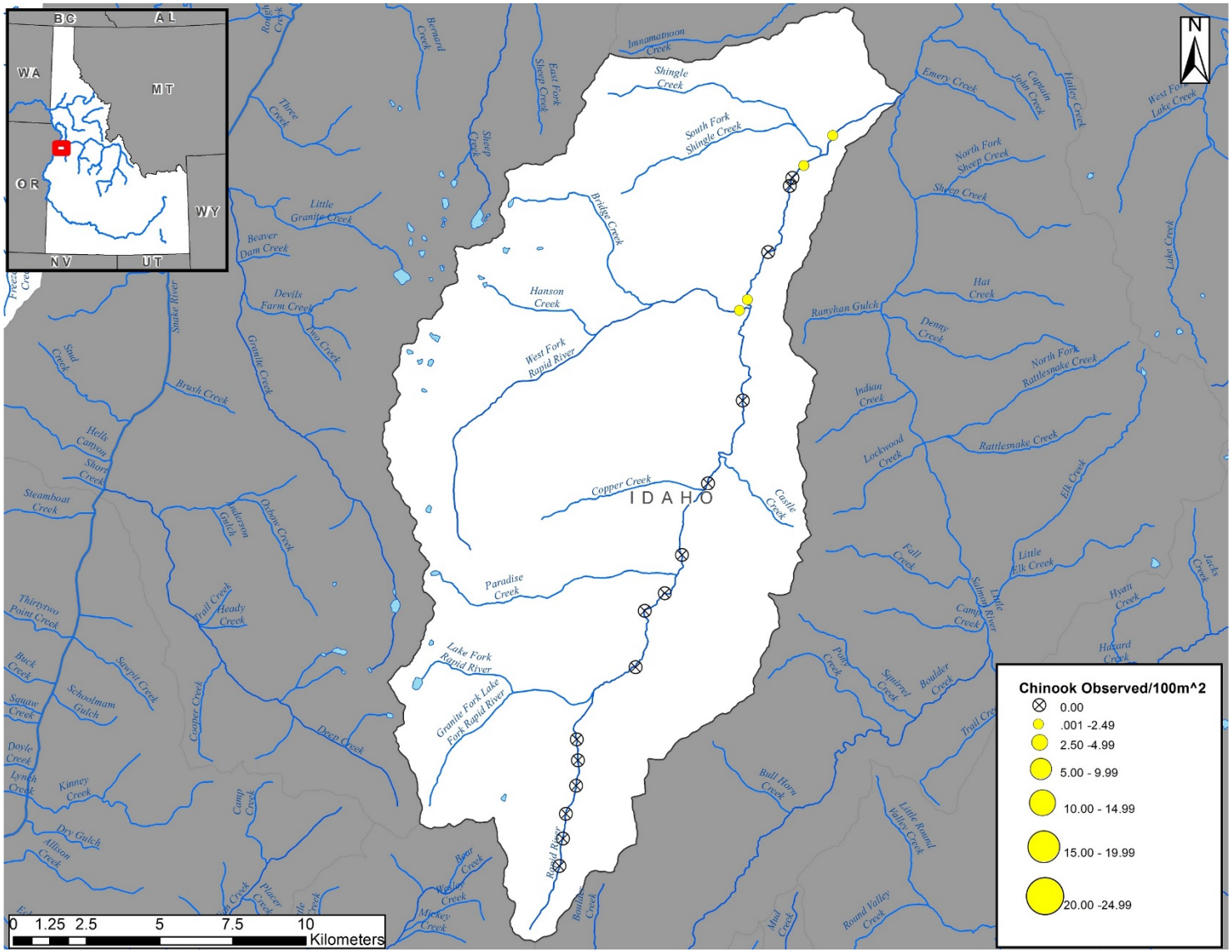

Figure 16. Map displaying the densities and distribution of Chinook Salmon observed in 2021 throughout Rapid River (Salmon River basin), Idaho, during intensive GRTS snorkel surveys.

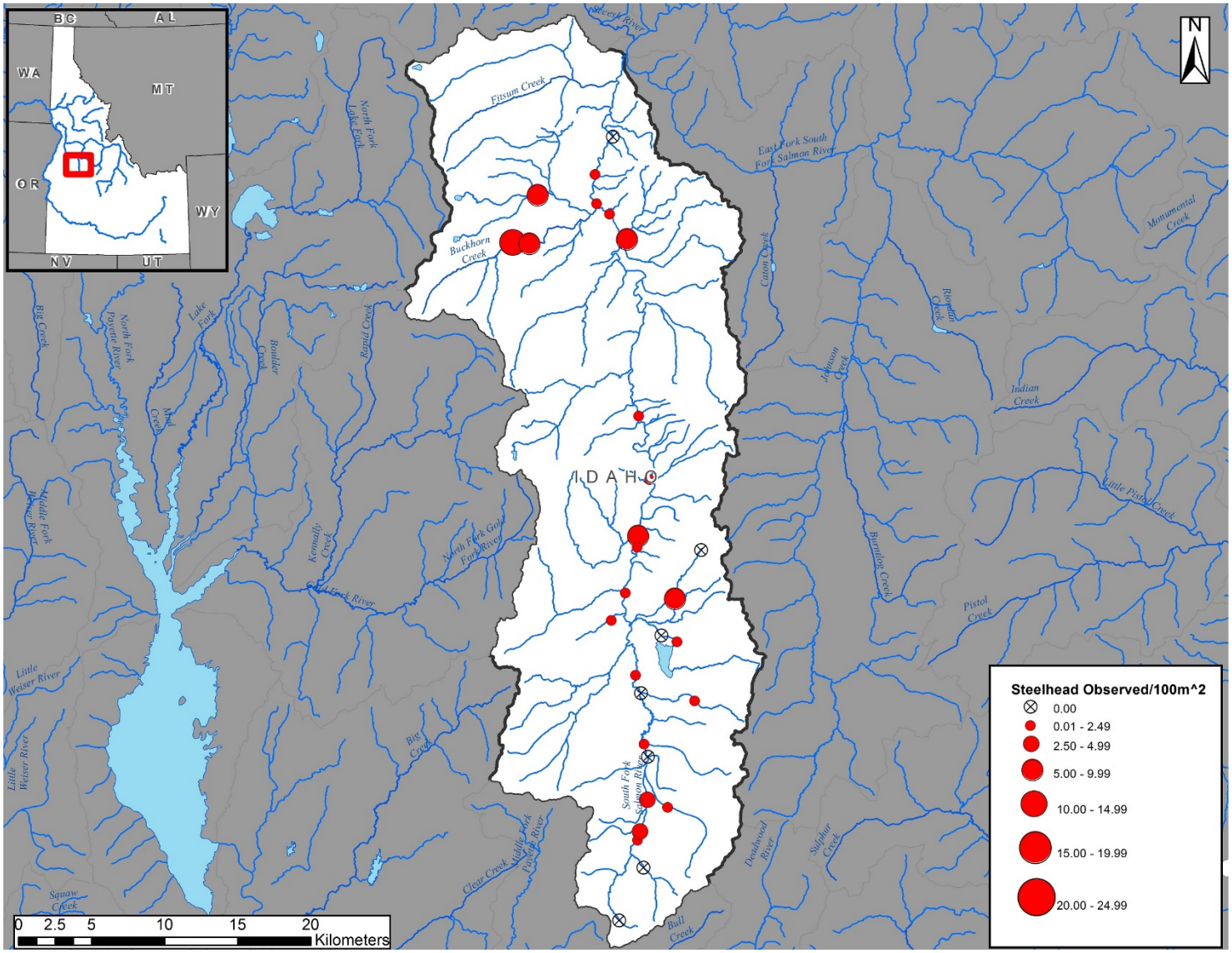

Figure 17. Map displaying the densities and distribution of steelhead observed in 2021 throughout the South Fork Salmon River (Salmon River basin above Krassel Gauge), Idaho, during intensive GRTS snorkel surveys.

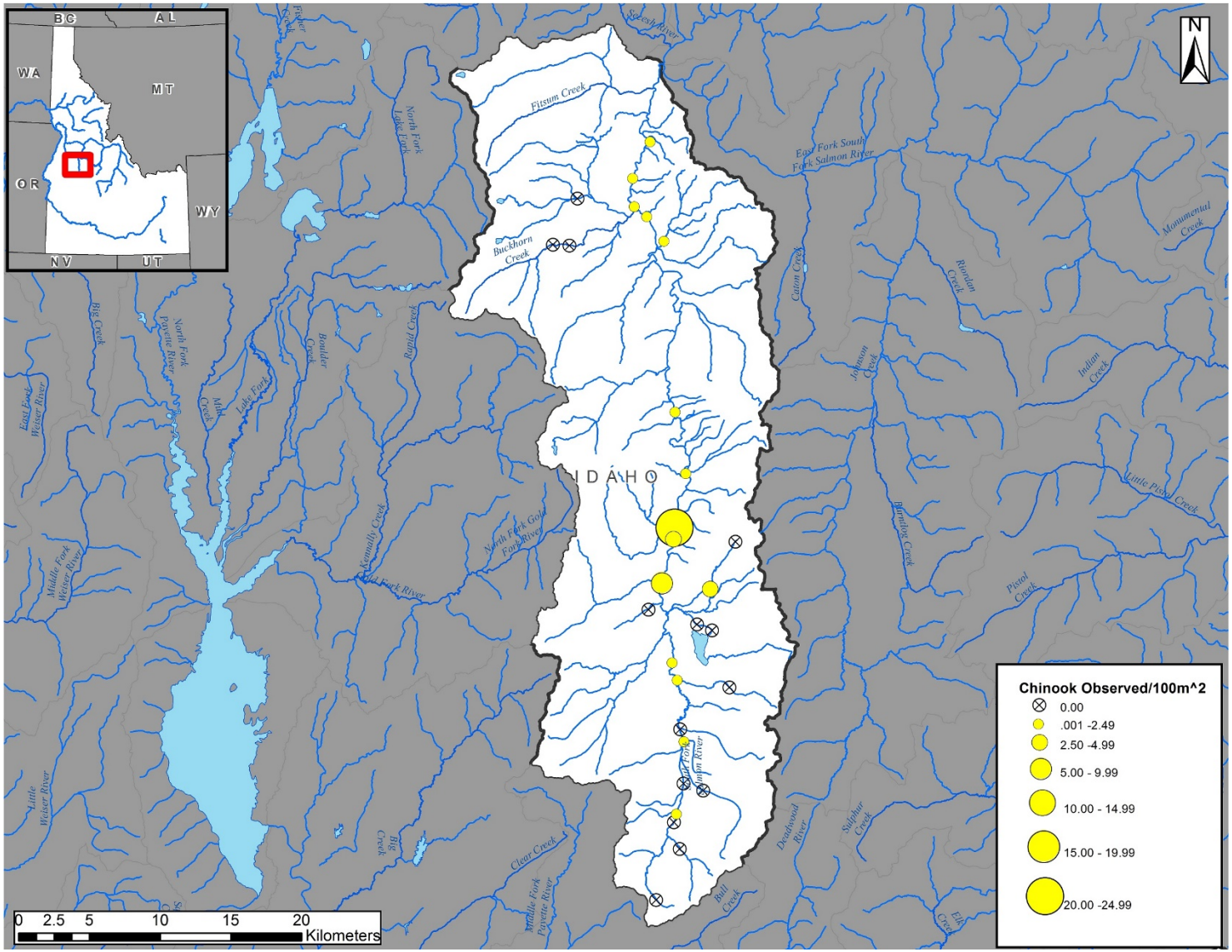

Figure 18. Map displaying the densities and distribution of Chinook Salmon observed in 2021 throughout the South Fork Salmon River (Salmon River basin above Krassel Gauge), Idaho, during intensive GRTS snorkel surveys.

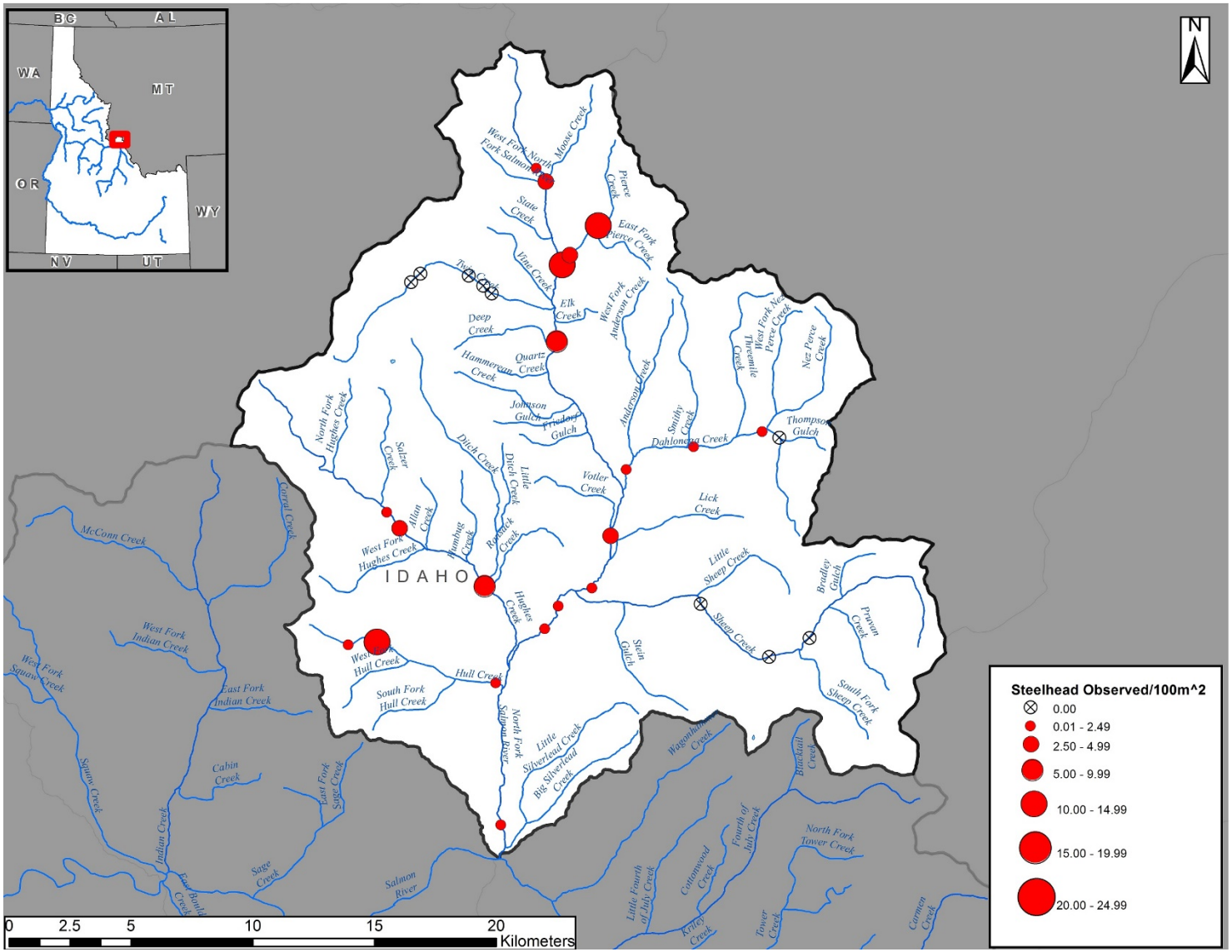

Figure 19. Map displaying the densities and distribution of steelhead observed in 2021 throughout the North Fork Salmon River (Salmon River basin), Idaho, during intensive GRTS snorkel surveys.

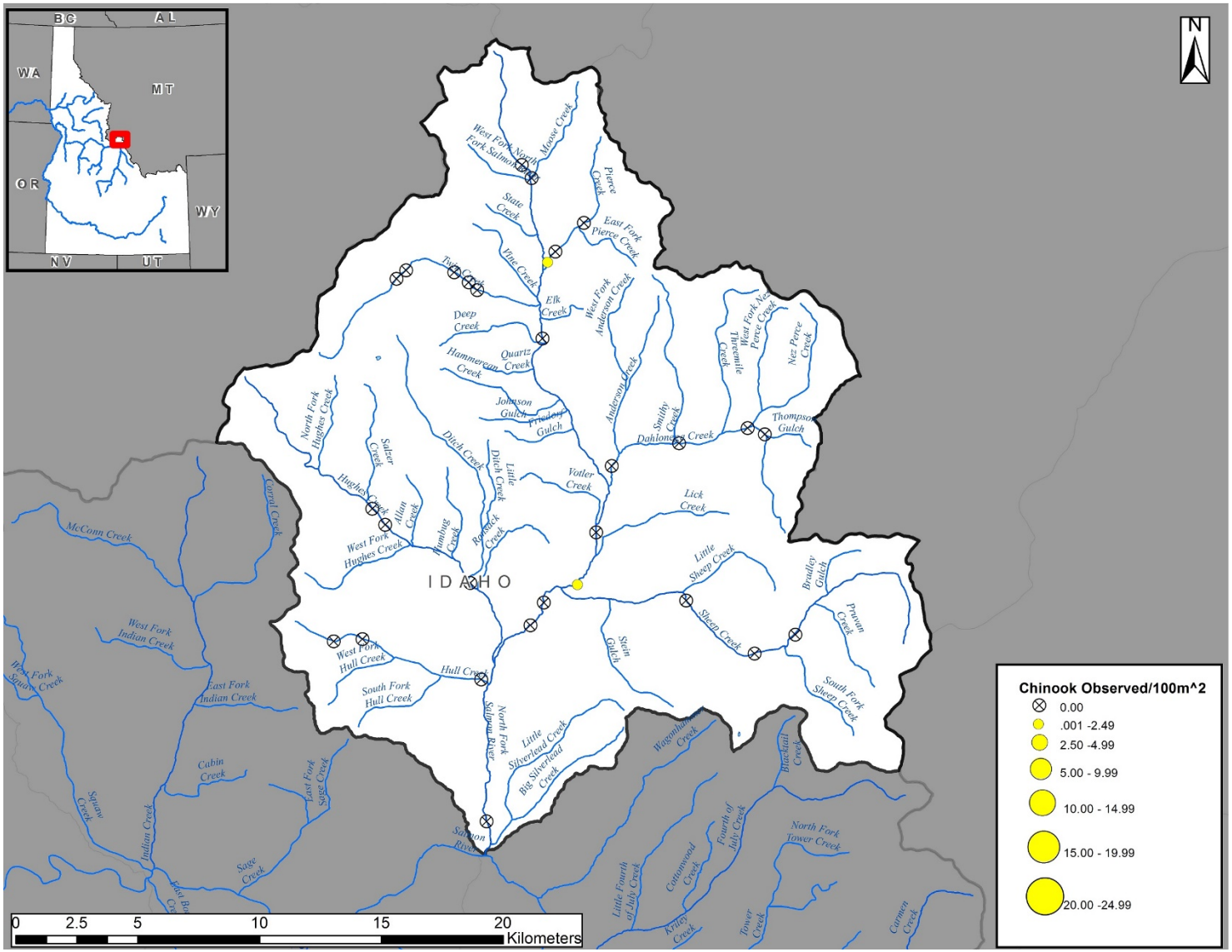

Figure 20. Map displaying the densities and distribution of Chinook Salmon observed in 2021 throughout the North Fork Salmon River (Salmon River basin), Idaho, during intensive GRTS snorkel surveys.

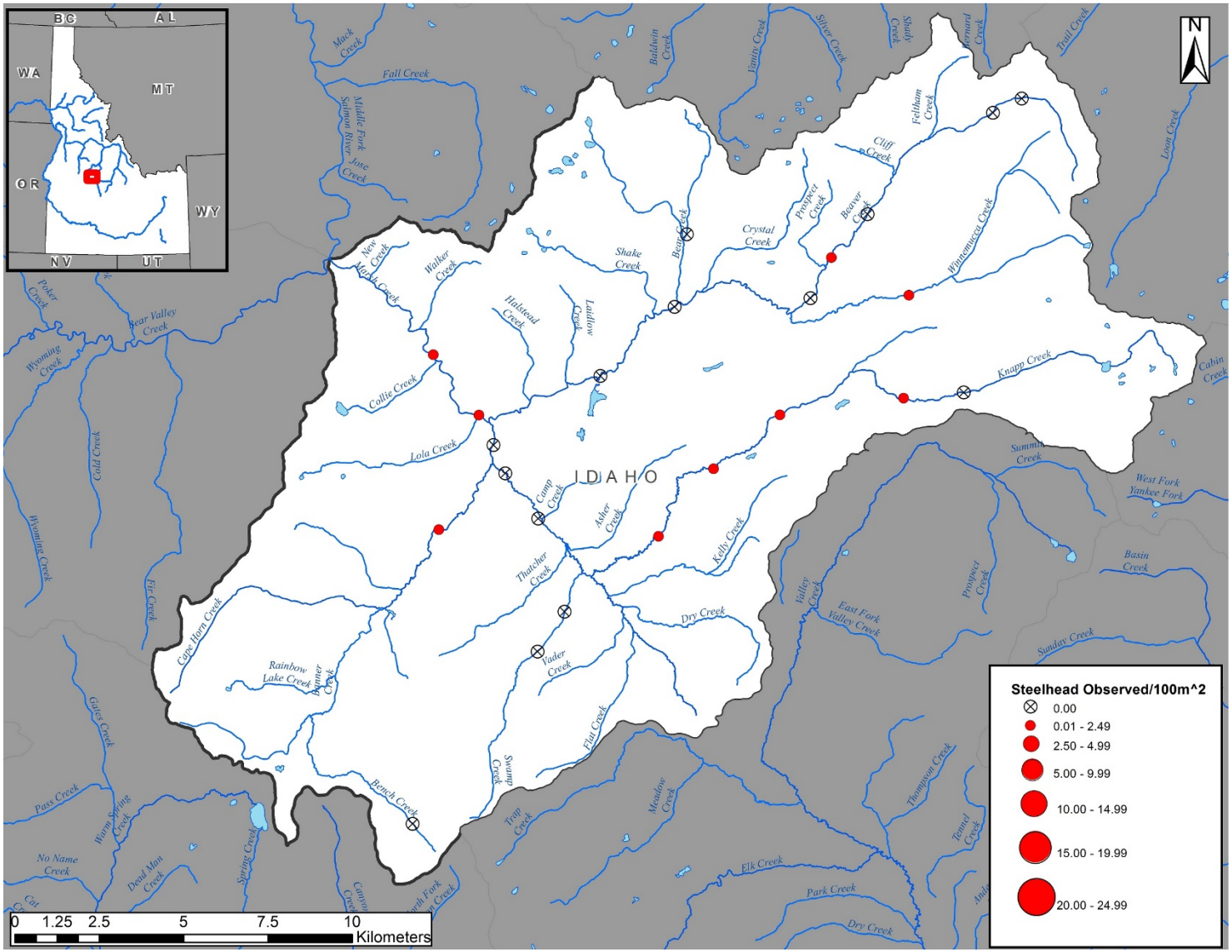

Figure 21. Map displaying the densities and distribution of steelhead observed in 2021 throughout Marsh Creek (Salmon River basin), Idaho, during intensive GRTS snorkel surveys.

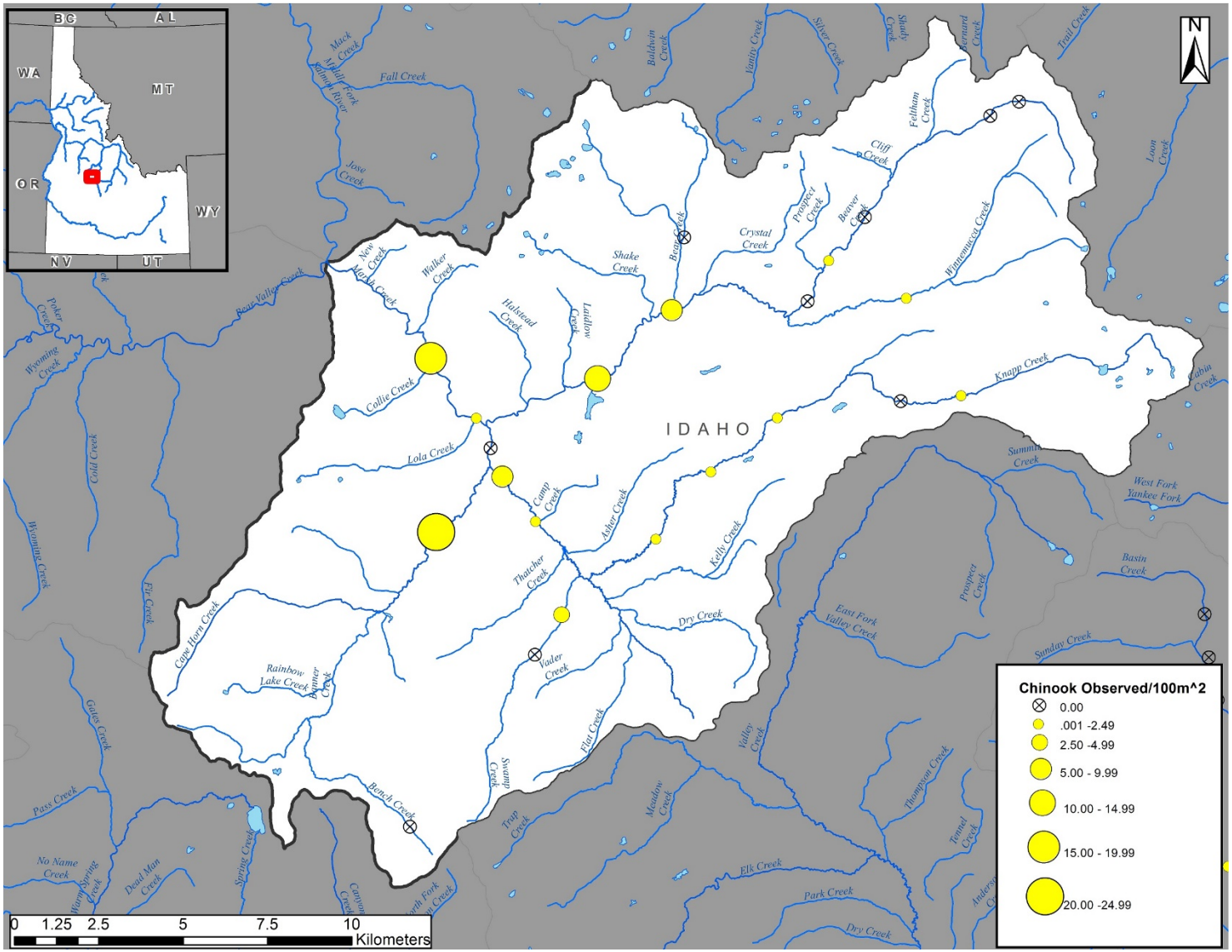

Figure 22. Map displaying the densities and distribution of Chinook Salmon observed in 2021 throughout Marsh Creek (Salmon River basin), Idaho, during intensive GRTS snorkel surveys.

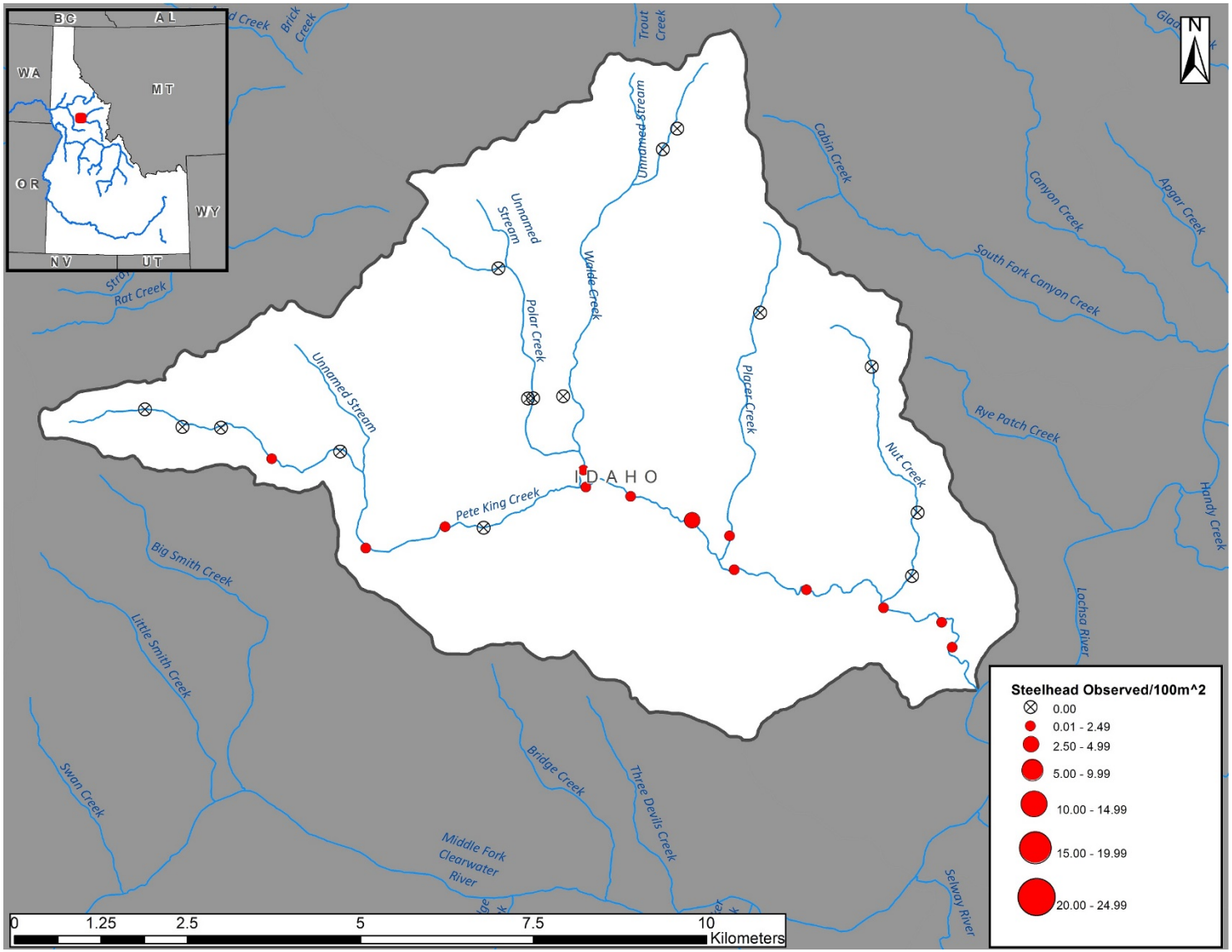

Figure 23. Map displaying the densities and distribution of steelhead observed in 2021 throughout the Pete King Creek (Clearwater River basin), Idaho, during extensive GRTS snorkel surveys.

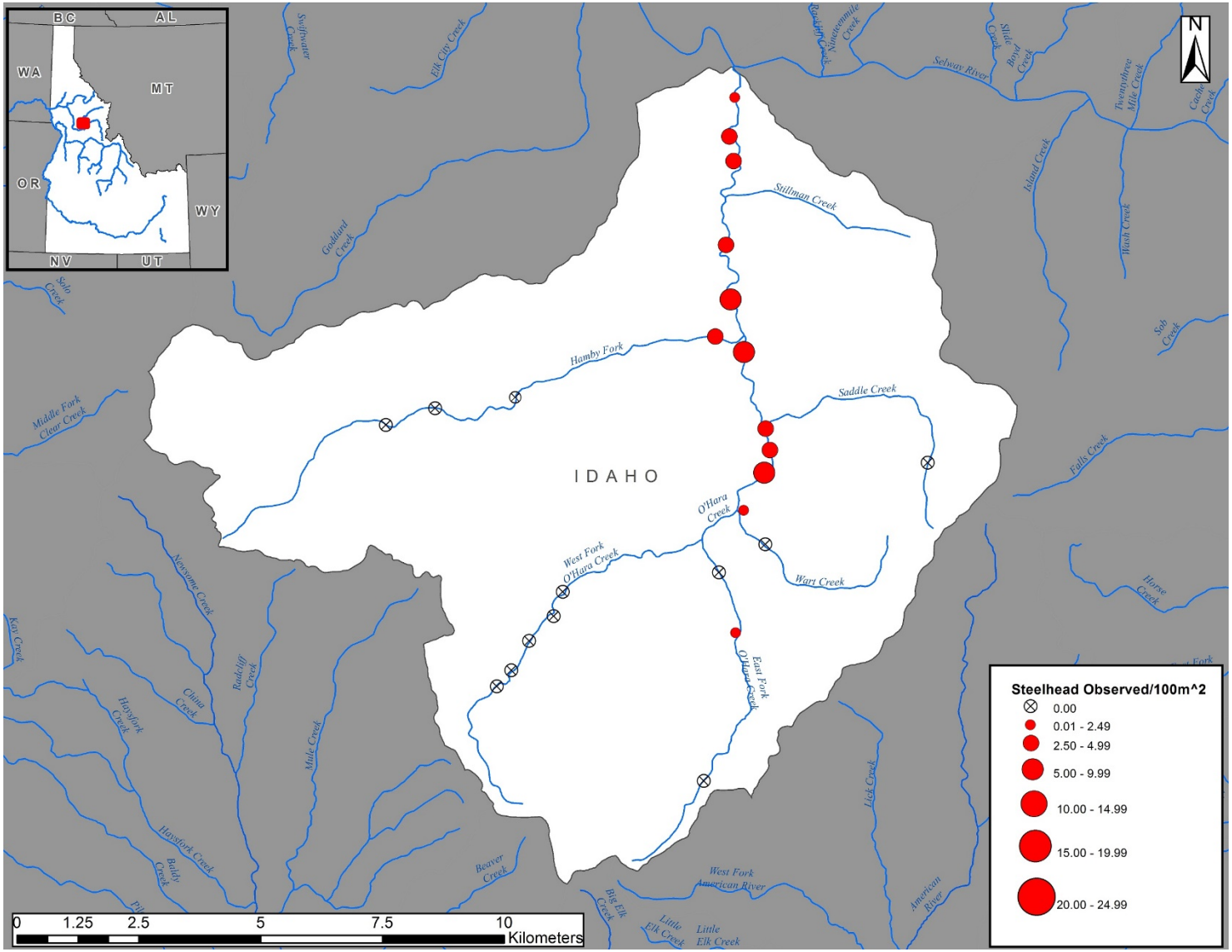

Figure 24 Map displaying the densities and distribution of steelhead observed in 2021 throughout the O'Hara Creek (Clearwater River basin), Idaho, during extensive GRTS snorkel surveys.

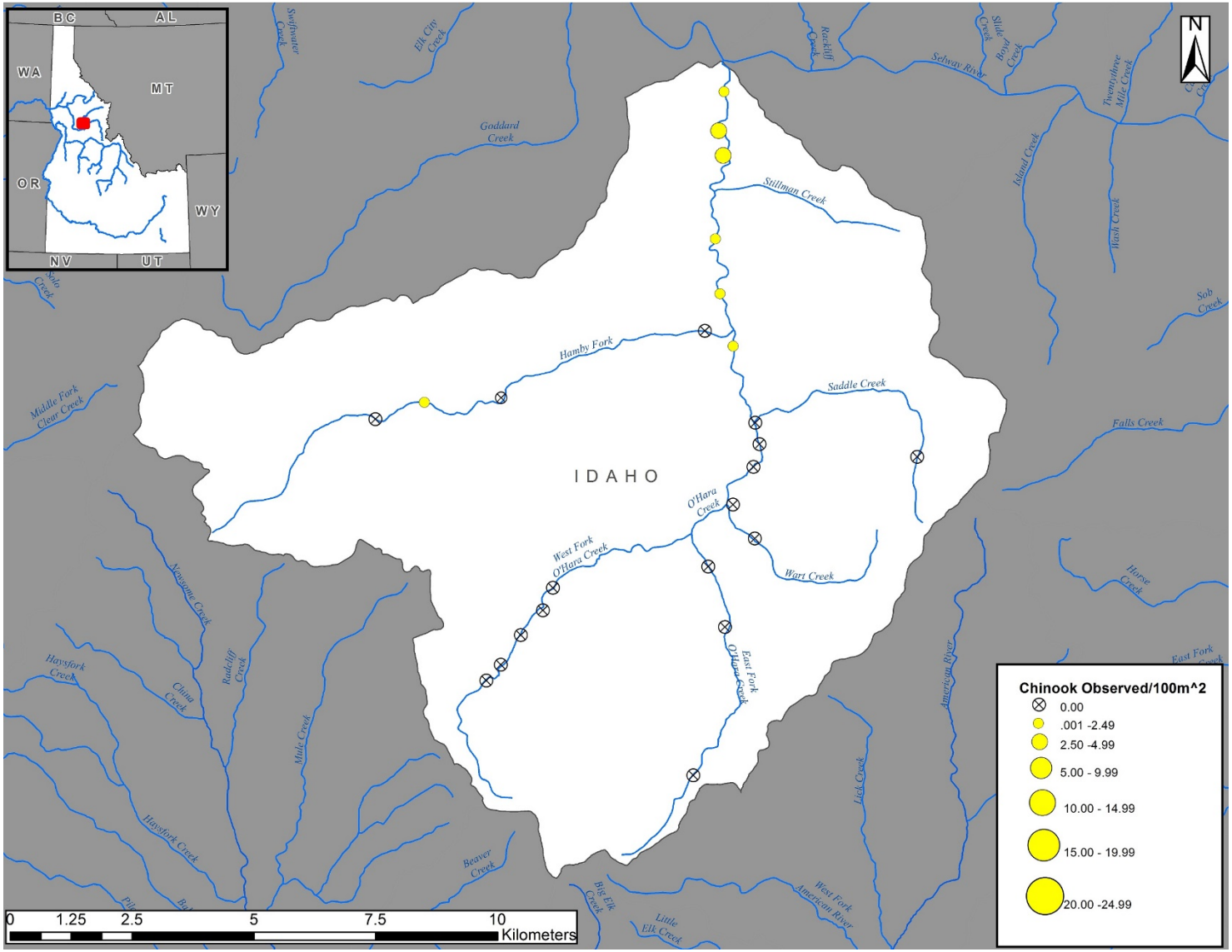

Figure 25. Map displaying the densities and distribution of Chinook Salmon observed in 2021 throughout the O'Hara Creek (Clearwater River basin), Idaho, during extensive GRTS snorkel surveys.

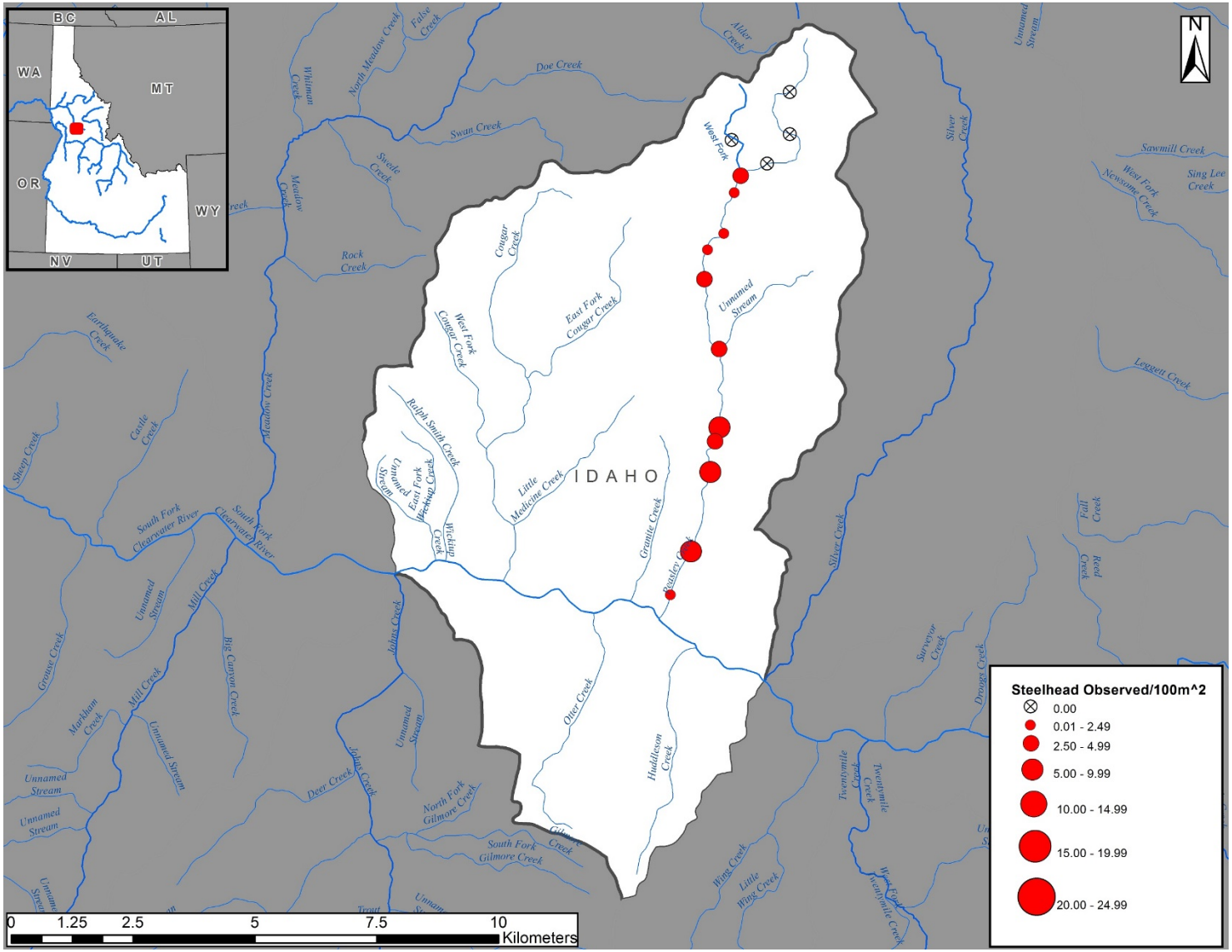

Figure 26. Map displaying the densities and distribution of steelhead observed in 2021 throughout the Peasley Creek (Clearwater River basin), Idaho, during extensive GRTS snorkel surveys.

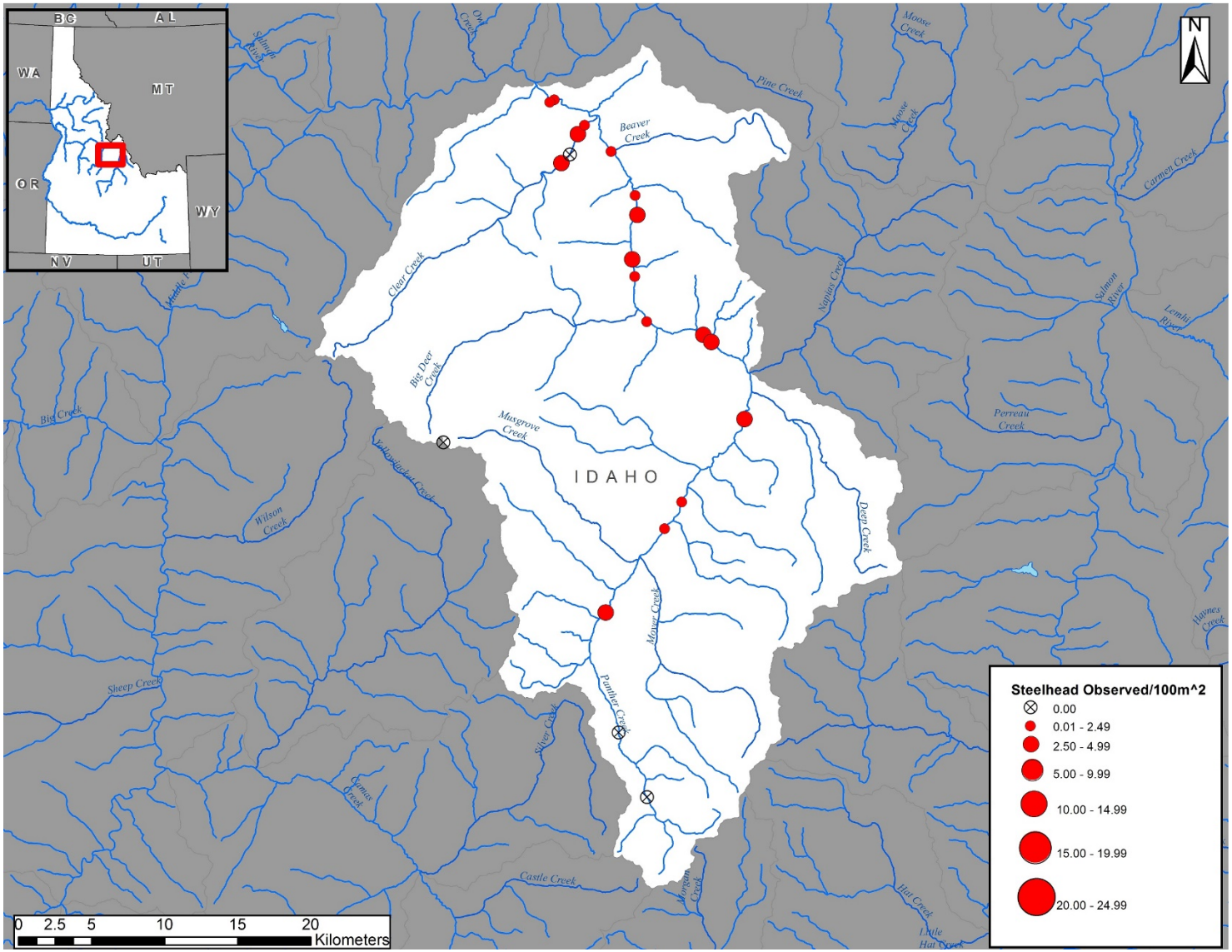

Figure 27. Map displaying the densities and distribution of steelhead observed in 2021 throughout Panther Creek (Salmon River basin), Idaho, during extensive GRTS snorkel surveys.

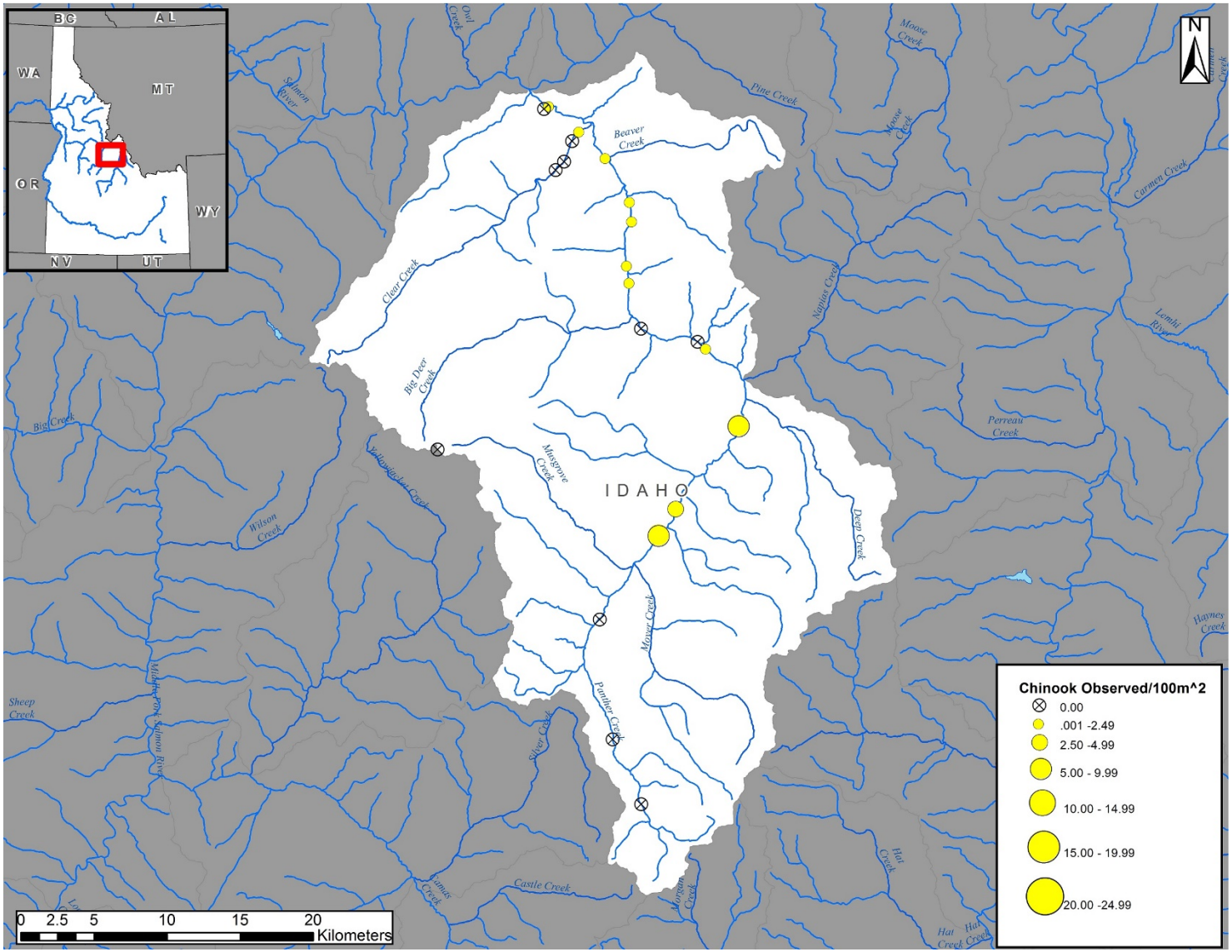

Figure 28. Map displaying the densities and distribution of Chinook Salmon observed in 2021 throughout Panther Creek (Salmon River basin), Idaho, during extensive GRTS snorkel surveys.

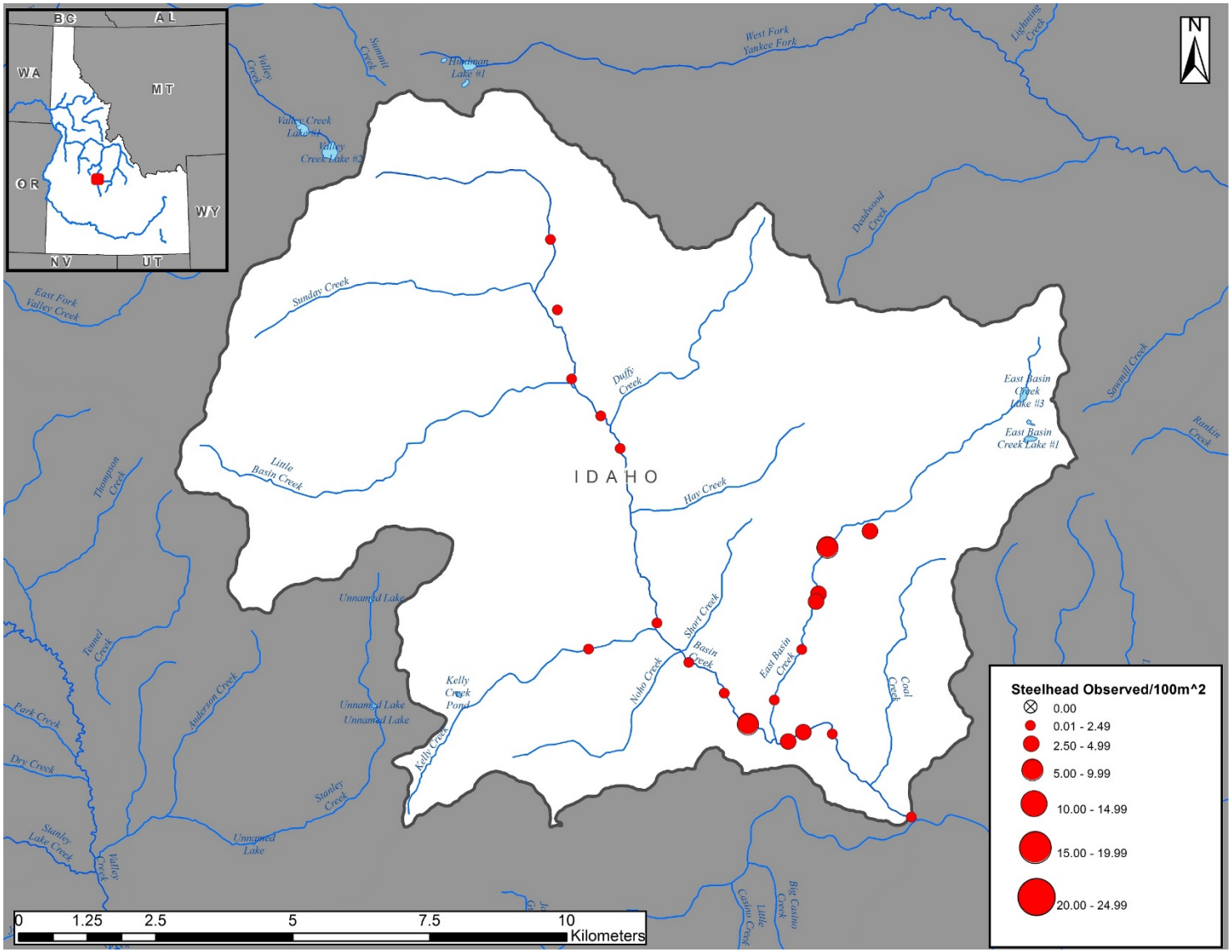

Figure 29. Map displaying the densities and distribution of steelhead observed in 2021 throughout Basin Creek (Salmon River basin), Idaho, during extensive GRTS snorkel surveys.

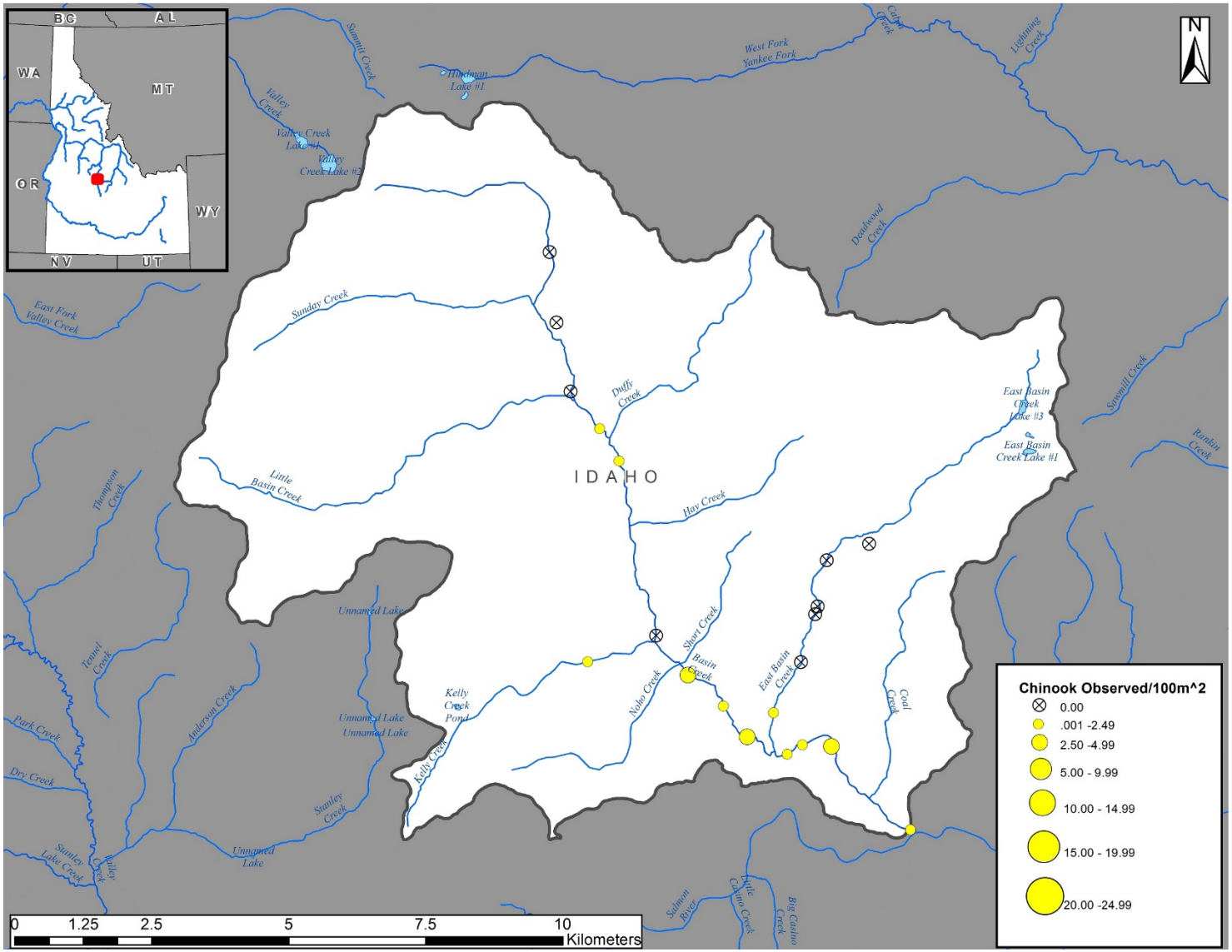

Figure 30. Map displaying the densities and distribution of Chinook Salmon observed in 2021 throughout Basin Creek (Salmon River basin), Idaho, during extensive GRTS snorkel surveys.

APPENDICES

APPENDIX A: IDFG CORE, NON-CORE, AND RESIDENT FISH SNORKEL TRANSECT DETAILS

Appendix A1. IDFG core trend snorkel survey transects *n* = 216 by Snake River steelhead major and independent population. Middle Fork Salmon River and its tributaries were surveyed by regional management crews funded by the Dingell-Johnson Act and License funds.

Steelhead major and independent population	Stream name	Stratum	Transect name	Survey frequency	Last surveyed	Next scheduled survey
Hells Canyon Tributaries						
Hells Canyon (SNHCT-s)	Granite Creek	---	1	Annual	2021	2022
	Granite Creek	---	3	Annual	2021	2022
	Sheep Creek	---	1	Annual	2021	2022
	Sheep Creek	---	2	Annual	2021	2022
Independent Population Total:			4			
MPG Total:			4			
Clearwater River						
Lower Clearwater River (CRLMA-s)	Big Canyon Creek	---	1	Annual	2021	2022
Independent Population Total:			1			
South Fork Clearwater River (CRSFC-s)	American River	2	1	Annual	2021	2022
	American River	3	2	Triennial	2021	2024
	Crooked River	1	BOULDER-A	Annual	2021	2022
	Crooked River	1	BOULDER-B	Triennial	2021	2024
	Crooked River	1	SILL-LOG-B	Triennial	2021	2024
	Crooked River	2	CONTROL1	Triennial	2021	2024
	Crooked River	2	CONTROL2	Triennial	2021	2024
	Crooked River	2	TREAT2	Annual	2021	2022
	Crooked River	3	NATURAL1	Annual	2021	2022
	Crooked River	C	CAN2	Triennial	2021	2024
	Crooked River	C	CAN3	Annual	2021	2022
	East Fork Crooked River	H	EF1	Annual	2021	2022
	East Fork Crooked River	H	EF2	Triennial	2017	2024
	Johns Creek	1	1	Triennial	2021	2024
	Johns Creek	2	3	Triennial	2021	2024
	Red River	1	CNTL 1	Annual	2021	2022
	Red River	1	CNTL 2	Annual	2021	2022
	Red River	2	CNTL 2	Annual	2021	2022
	Red River	2	TREAT 2	Annual	2021	2022
	Red River	4	CNTL 2	Annual	2021	2022
	Red River	4	TREAT 2	Annual	2021	2022
	Red River	5	CNTL 2	Annual	2021	2022
	Red River	5	TREAT 2	Annual	2021	2022
	Relief Creek	1	1A	Triennial	2021	2024
	Relief Creek	1	1B	Triennial	2021	2024
	Tenmile Creek	---	1	Triennial	2021	2024
	West Fork Crooked River	H	WF1	Annual	2021	2022
	West Fork Crooked River	H	WF2	Triennial	2021	2024
			28			

Appendix A1. Continued

Steelhead major and independent population	Stream name	Stratum	Transect name	Survey frequency	Last surveyed	Next scheduled survey
Independent Population Total:			28			
Lochsa River (CRLOC-s)	Brushy Fork	3	1	Biennial	2019	2022
	Brushy Fork	3	2	Annual	2019	2022
	Colt Creek		BRIDGE	Biennial	2019	2022
	Crooked Fork Creek	1	2A	Biennial	2019	2022
	Crooked Fork Creek	2	3A	Biennial	2019	2022
	Crooked Fork Creek	2	4A	Biennial	2019	2022
	Crooked Fork Creek	3	1	Biennial	2019	2022
	Crooked Fork Creek	3	2	Biennial	2019	2022
	Crooked Fork Creek	3	2B	Annual	2019	2022
	Crooked Fork Creek	4	1B	Annual	2019	2022
	Fish Creek	---	1	Annual	2021	2022
	Fish Creek	---	2	Annual	2021	2022
	Lochsa River	---	L1	Annual	2021	2022
	Lochsa River	---	L2	Biennial	2021	2023
	Lochsa River	---	L3	Biennial	2021	2023
	Lochsa River	---	L4	Annual	2021	2022
	Old Man Creek	---	1	Triennial	2021	2024
	Postoffice Creek	---	1	Triennial	2021	2024
	Postoffice Creek	---	2	Triennial	2021	2024
	Warm Springs Creek	---	1	Biennial	2021	2023
	White Sands Creek	---	LWRMONITOR	Biennial	2021	2023
Independent Population Total:			21			
Selway River (CRSEL-s)	Bear Creek	---	1	Annual	2021	2022
	Bear Creek	---	2	Annual	2021	2022
	Deep Creek	---	CACTUS	Annual	2021	2022
	Deep Creek	---	SCIMITAR	Annual	2021	2022
	East Fork Moose Creek	---	3	Annual	2021	2022
	Meadow Creek	---	1	Annual	2021	2022
	Moose Creek	---	1	Annual	2021	2022
	Moose Creek	---	2	Annual	2021	2022
	Running Creek	---	1	Annual	2021	2022
	Running Creek	---	2	Annual	2021	2022
	Selway River	---	HELLSHALF	Annual	2021	2022
	Selway River	---	LITTLE-CW	Annual	2021	2022
	Selway River	---	MAG-XING	Annual	2021	2022
	Selway River	---	RUNNING CR	Annual	2021	2022
	Three Links Creek	---	1	Annual	2021	2022
	White Cap Creek	3	1	Annual	2021	2022

Appendix A1. Continued

Steelhead major and independent population	Stream name	Stratum	Transect name	Survey frequency	Last surveyed	Next scheduled survey
	White Cap Creek	3	2	Annual	2021	2022
	White Cap Creek	3	3	Annual	2021	2022
Independent Population Total:			18			
MPG Total:			68			
Salmon River						
Little Salmon River (SRLSR-s)	Boulder Creek	ABOVE	1	Annual	2021	2022
	Boulder Creek	ABOVE	2	Annual	2021	2022
	Boulder Creek	BELOW	3	Annual	2021	2022
	Boulder Creek	BELOW	5	Annual	2021	2022
	Hazard Creek	---	HAZ1	Annual	2021	2022
	Little Salmon River	---	1	Annual	2021	2022
	Little Salmon River	---	2	Annual	2021	2022
	Rapid River	BLW W FK	RAP2	Annual	2021	2022
	Slate Creek	---	1	Triennial	2019	2022
	Slate Creek	---	2	Triennial	2019	2022
	Slate Creek	---	3	Triennial	2019	2022
	Slate Creek	---	4	Triennial	2021	2022
	Slate Creek	---	6	Triennial	2019	2022
	South Fork White Bird Creek	---	SF-#2	Triennial	2019	2022
	South Fork White Bird Creek	---	SF-#3	Triennial	2019	2022
	West Fork Rapid River	BLW FALLS	RAP1	Annual	2021	2022
	White Bird Creek	---	1	Triennial	2019	2022
Independent Population Total:			17			
South Fork Salmon River (SFMAI-s)	East Fork South Fork Salmon	ABV JHNSN	3	Biennial	2021	2023
	East Fork South Fork Salmon	BLW JHNSN	6	Biennial	2021	2023
	East Fork South Fork Salmon	BLW JHNSN	7	Biennial	2021	2023
	Johnson Creek	LOWER IV	L2	Triennial	2019	2022
	Johnson Creek	LOWER IV	L3	Triennial	2019	2022
	Johnson Creek	MID LOWIII	PW3B	Triennial	2019	2022
	Johnson Creek	MID UPR II	PW3A	Triennial	2019	2022
	Johnson Creek	UPPER I	M1	Triennial	2019	2022
	Johnson Creek	UPPER I	M2	Triennial	2019	2022
	Johnson Creek	UPPER I	M3	Triennial	2019	2022
	Johnson Creek	UPPER I	PW1A	Triennial	2019	2022
	Rock Creek	UPPER I	M1	Triennial	2019	2022
	Sand Creek	UPPER I	M2	Triennial	2019	2022
	South Fork Salmon River	---	11	Annual	2021	2022
	South Fork Salmon River	---	14	Annual	2021	2022
	South Fork Salmon River	---	16	Annual	2021	2022
	South Fork Salmon River	---	5	Annual	2021	2022
	South Fork Salmon River	---	7	Annual	2021	2022
	South Fork Salmon River	---	POVERTY	Annual	2021	2022

Appendix A1. Continued

Steelhead major and independent population	Stream name	Stratum	Transect name	Survey frequency	Last surveyed	Next scheduled survey
	South Fork Salmon River	---	STOLLE1	Annual	2021	2022
	South Fork Salmon River	---	STOLLE2	Annual	2021	2022
Independent Population Total:			21			
Secesh River (SFSEC-s)	Lake Creek	---	BURGDORF	Annual	2021	2022
	Lake Creek	---	WILLOW CR	Annual	2021	2022
	Lick Creek	---	L3	Annual	2021	2022
	Secesh River	---	GROUSE	Annual	2021	2022
	Secesh River	---	LONG-GULCH	Annual	2021	2022
Independent Population Total:			5			
Chamberlain Creek (SRCHA-s)	Bargamin Creek	---	1	Biennial	2018	2022
	Bargamin Creek	---	2	Biennial	2018	2022
	Chamberlain Creek	---	CHA1	Biennial	2020	2022
	Chamberlain Creek	---	CHA4	Biennial	2020	2022
	Sheep Creek	---	L1	Biennial	2018	2022
	Sheep Creek	---	L2	Biennial	2018	2022
	West Fork Chamberlain Cr.	---	CHA2	Biennial	2020	2022
	West Fork Chamberlain Cr.	---	CHA3	Biennial	2020	2022
Independent Population Total:			8			
Lower Middle Fork Salmon River (Loon Creek and below; MFBIG-s)	Big Creek	LOWER	L1	Annual	2021	2022
	Big Creek	MIDDLE	Cabin Cr	Biennial	2019	2022
	Big Creek	MIDDLE	TAYLOR 1	Biennial	2019	2022
	Big Creek	UPPER	LOGAN CR	Biennial	2019	2022
	Camas Creek	---	2	Biennial	2021	2023
	Camas Creek	---	CAM1	Biennial	2021	2023
	Loon Creek	C CHANNEL	2	Biennial	2021	2023
	Loon Creek	LNM1	3	Biennial	2021	2023
	Loon Creek	PACK BR	1	Biennial	2021	2023
	Middle Fork Salmon River	2	HOSPPL	Annual	2021	2022
	Middle Fork Salmon River	2	HOSPRUN	Annual	2021	2022
	Middle Fork Salmon River	2	TAPPANPOOL	Annual	2021	2022
	Middle Fork Salmon River	2	TAPPANRUN	Annual	2021	2022
	Middle Fork Salmon River	3	AIRSTRIP	Annual	2021	2022
	Middle Fork Salmon River	3	FLYING-B	Annual	2021	2022
	Middle Fork Salmon River	3	SURVEY	Annual	2021	2022
	Middle Fork Salmon River	4	BIG-CR-BR	Annual	2021	2022
	Middle Fork Salmon River	4	GOATPOOL	Annual	2021	2022
	Middle Fork Salmon River	4	GOATRUN	Annual	2021	2022
	Middle Fork Salmon River	4	LITOUZEL	Annual	2021	2022
	Middle Fork Salmon River	4	LOVEBAR	Annual	2021	2022
	Middle Fork Salmon River	4	OTTERBAR	Annual	2021	2022
	Middle Fork Salmon River	4	SHIPISLAND	Annual	2021	2022

Appendix A1. Continued

Steelhead major and independent population	Stream name	Stratum	Transect name	Survey frequency	Last surveyed	Next scheduled survey
	Monumental Creek	---	MON1	Triennial	2019	2022
	Monumental Creek	---	MON2	Triennial	2019	2022
	Monumental Creek	---	MON3	Triennial	2019	2022
	Monumental Creek	---	MON5	Triennial	2019	2022
	West Fork Monumental Creek	---	MON4	Triennial	2019	2022
Independent Population Total:			28			
Upper Middle Fork Salmon River (above Loon Creek; MFUMA-s)	Beaver Creek	---	A	Annual	2021	2022
	Beaver Creek	---	B	Annual	2021	2022
	Cape Horn Creek	1	A	Annual	2021	2022
	Cape Horn Creek	2	B	Annual	2021	2022
	Elk Creek	---	1A	Annual	2021	2022
	Elk Creek	---	1B	Annual	2021	2022
	Elk Creek	---	2A	Annual	2021	2022
	Elk Creek	---	2B	Annual	2021	2022
	Knapp Creek	1	A	Annual	2021	2022
	Knapp Creek	1	B	Annual	2021	2022
	Knapp Creek	1	LCKD FENCE	Annual	2021	2022
	Marble Creek	UPPER	MAR1	Biennial	2021	2023
	Marble Creek	UPPER	MAR1B	Biennial	2021	2023
	Marble Creek	UPPER	MAR2	Biennial	2021	2023
	Marsh Creek	1	A	Annual	2021	2022
	Marsh Creek	1	B	Annual	2021	2022
	Marsh Creek	3	A	Annual	2021	2022
	Marsh Creek	4	B	Annual	2021	2022
	Marsh Creek	5	A	Annual	2021	2022
	Middle Fork Salmon River	1	BOUNDARY	Annual	2021	2022
	Middle Fork Salmon River	1	ELKHORN	Annual	2021	2022
	Middle Fork Salmon River	1	GRDLHOLE	Annual	2021	2022
	Middle Fork Salmon River	1	GREYHOUND	Annual	2021	2022
	Middle Fork Salmon River	1	INDIAN	Annual	2021	2022
	Middle Fork Salmon River	1	RAPID-R	Annual	2021	2022
	Middle Fork Salmon River	1	SHEEPEATER	Annual	2021	2022
	Middle Fork Salmon River	1	VELVET	Annual	2021	2022
	Middle Fork Salmon River	2	COUGAR	Annual	2021	2022
	Middle Fork Salmon River	2	LJACKASS	Annual	2021	2022
	Middle Fork Salmon River	2	MARBLPL	Annual	2021	2022
	Middle Fork Salmon River	2	PUNGO	Annual	2021	2022
	Middle Fork Salmon River	2	ROCK IS	Annual	2021	2022
	Middle Fork Salmon River	2	SKIJUMP	Annual	2021	2022
	Middle Fork Salmon River	2	WHITEYCX	Annual	2021	2022
Independent Population Total:			34			
Panther Creek (SRPAN-s)	Horse Creek	---	L1	Triennial	2021	2024

Appendix A1. Continued

Steelhead major and independent population	Stream name	Stratum	Transect name	Survey frequency	Last surveyed	Next scheduled survey
	Horse Creek	---	L2	Triennial	2021	2024
	Panther Creek	ABOVE	PC9	Annual	2021	2022
	Panther Creek	DS-BIGD	PC4	Annual	2021	2022
	Panther Creek	DS-BLACKB	PC6	Annual	2021	2022
	Panther Creek	DS-CLEAR	PC1	Annual	2021	2022
Independent Population Total:			6			
North Fork Salmon River (SRNFS-s)	North Fork Salmon River	2	DAHLONEGA	Annual	2021	2022
	Pine Creek	---	BRIDGE	Annual	2021	2022
	Pine Creek	---	SAWMILL CR	Triennial	2021	2024
	North Fork Salmon River	2	HUGHES	Triennial	2021	2024
Independent Population Total:			4			
Lemhi River (SRLEM-s)	Big Springs Creek	LEM1	A	Biennial	2021	2023
	Hayden Creek	HC2	B	Biennial	2021	2023
	Hayden Creek	HC3	B	Biennial	2021	2023
	Lemhi	1	LEM3A	Biennial	2018	2022
Independent Population Total:			4			
Pahsimeroi River (SRPAH-s)	Pahsimeroi River	LOWER	DWTNLANE	Biennial	2021	2023
Independent Population Total:			1			
East Fork Salmon River (SREFS-s)	East Fork Salmon River	ABOVE-WEIR	2	Biennial	2021	2023
	East Fork Salmon River	ABOVE-WEIR	3	Biennial	2021	2023
	Morgan Creek	UPPER	BLM CAMP	Triennial	2021	2024
Independent Population Total:			3			
Upper Salmon River (SRUMA-s)	Alturas Lake Creek	2	2B	Annual	2021	2022
	Redfish Lake Creek	---	LOWER	Annual	2021	2022
	Redfish Lake Creek	---	WEIR DS	Annual	2021	2022
	Salmon River	1	RBNSN-BAR	Annual	2021	2022
	Salmon River	2	2B	Annual	2021	2022
	Salmon River	3	3B	Annual	2021	2022
	Salmon River	3	3BRA	Annual	2021	2022
	Salmon River	4	4B	Annual	2021	2022
	Salmon River	7	7A	Annual	2021	2022
	Valley Creek	1	B	Annual	2021	2022
	Valley Creek	3	A	Annual	2021	2022
	Valley Creek	3	B	Annual	2021	2022
	Valley Creek	6	B	Annual	2021	2022
Independent Population Total:			13			
MPG Total:			144			
Snake River DPS Total:			218			

Appendix A2. IDFG non-core trend snorkel survey transects n = 103 by Snake River steelhead major population group (bold) and independent population. Middle Fork Salmon River and its tributaries were surveyed by regional management crews funded by the Dingell-Johnson Act and License funds.

Steelhead major and independent population	Stream name	Stratum	Transect name	Survey frequency	Last surveyed	Next scheduled survey
Hells Canyon Tributaries						
Hells Canyon (SNHCT-s)	Granite Creek	---	2	Opportunistic	2013	
Independent Population Total:			1			
MPG Total:			1			
Clearwater River						
Lower Clearwater River (CRLMA-s)	East Fork Potlatch River	---	PFI4	Opportunistic	2021	2022
	East Fork Potlatch River	---	PFI5	Opportunistic	2021	2022
	East Fork Potlatch River	---	PFI6	Opportunistic	2019	2022
	East Fork Potlatch River	---	PFI7	Opportunistic	2021	2022
	East Fork Potlatch River	---	PFI8	Opportunistic	2021	2022
	East Fork Potlatch River	---	PFI9	Opportunistic	2021	2022
	East Fork Potlatch River	---	1	Opportunistic	2021	2022
	East Fork Potlatch River	---	2	Opportunistic	2021	2022
	East Fork Potlatch River	---	3	Opportunistic	2021	2022
Independent Population Total:			9			
South Fork Clearwater River (CRSFC-s)	American River	2	1/8MABVEFK	Opportunistic	2018	
	American River	2	ABV CATTLE GRD	Variable	2018	
	American River	2	FLAT IRON RIDGE	Variable	2018	
	American River	2	GUNTLEYS	Variable	2018	
	American River	3	STOCK SIGN	Variable	2018	
	American River	1	2.25U	Variable	2018	
	American River	1	2.65U	Variable	2018	
	American River	1	GRAVEL PIT	Variable	2018	
	American River	3	.5MI BELOW BOXSING	Variable	2018	
	American River	3	BUFFALO PIT	Variable	2018	
	Crooked River	3	NATURAL3	Variable	2012	
	Crooked River	4	MEANDER2	Variable	2011	
	Crooked River	1	CONTROL2	Variable	2009	
	Johns Creek	2	4	Variable	2013	
	Red River	1	SHISSLER CR	Variable	2018	
	Red River	1	UPPER SHISSLER	Variable	2018	
	Red River	3	BELOW WEIR	Variable	2018	
	Red River	3	OLD BRIDGE	Variable	2018	
	Red River	4	BOULDER POOL	Variable	2018	
	Red River	6	CSUP 3	Variable	2011	

Appendix A2. Continued

Steelhead major and independent population	Stream name	Stratum	Transect name	Survey frequency	Last surveyed	Next scheduled survey
	Red River	6	CSUP 5	Opportunistic	2011	
	Relief Creek	2	2A	Opportunistic	2011	
	Relief Creek	2	2B	Opportunistic	2011	
	South Fork Clearwater River	---	103.2KM	Opportunistic	2009	
	South Fork Clearwater River	---	83.9KM	Opportunistic	2009	
	South Fork Clearwater River	---	88.7KM	Opportunistic	2009	
	South Fork Clearwater River	---	93.9KM	Opportunistic	2009	
	South Fork Clearwater River	---	98.7KM	Opportunistic	2009	
	Tenmile Creek	---	2	Opportunistic	2013	
Independent Population Total:			30			
Lochsa River (CRLOC-s)	Colt Killed Creek	---	LWRMONITOR	Opportunistic	2016	
	Fire Creek	---	1	Opportunistic	2017	
	Fire Creek	---	2	Opportunistic	2017	
	Hopeful Creek	1	1-BOOGIEDN	Opportunistic	2011	
	Split Creek	---	1	Opportunistic	2017	
	Split Creek	---	2	Opportunistic	2017	
Independent Population Total:			6			
Selway River (CRSEL-s)	East Fork Moose Creek	---	2	Opportunistic	2015	
	Gedney Creek	---	2	Opportunistic	2018	
	Marten Creek	---	1	Opportunistic	2017	
	Meadow Creek	---	2	Opportunistic	2018	
	OHara Creek	---	1	Opportunistic	2011	
	OHara Creek	---	2	Opportunistic	2021	
	Selway River	---	abv rodeo rapid	Opportunistic	2021	
	Selway River	---	above wolf cr. Rpd	Opportunistic	2021	
	Selway River	---	blw Rodeo rapid	Opportunistic	2021	
	Selway River	---	blw 3 links rpd	Opportunistic	2021	
	Selway River	---	Moose creek confluence	Opportunistic	2021	
	Selway River	---	Selway lodge	Opportunistic	2021	
	Selway River	---	1 mi. blw wt cap	Opportunistic	2021	
	Selway River	---	½ mile below Running	Opportunistic	2021	
	Selway River	---	½ mi. blw wt cap	Opportunistic	2021	
	Selway River	---	Abv goat cr	Opportunistic	2021	
	Selway River	---	Archer	Opportunistic	2021	
	Selway River	---	below ham rapid	Opportunistic	2021	
	Selway River	---	Blw pettibone cr	Opportunistic	2021	
	Selway River	---	cougar bluff	Opportunistic	2021	

Appendix A2. Continued

Steelhead major and independent population	Stream name	Stratum	Transect name	Survey frequency	Last surveyed	Next scheduled survey
	Selway River	---	DIVIDE	Opportunistic	2021	
	Selway River	---	dry bar	Opportunistic	2021	
	Selway River	---	rattlesnake	Opportunistic	2021	
	Selway River	---	BadLuck CR	Annual	2021	2022
	Selway River	---	@ Lower Tango	Annual	2021	2022
	Selway River	---	Big bend	Annual	2021	2022
	Selway River	---	Osprey Is	Opportunistic	2021	
Independent Population Total:			28			
MPG Total:			73			
Salmon River						
Little Salmon River (SRLSR-s)	Hazard Creek	---	HAZ2	Opportunistic	2021	
	Rapid River	ABV W FK	4	Annual	2021	2022
	Rapid River	ABV W FK	CASTLE CR	Annual	2021	2022
	Rapid River	ABV W FK	COPPER CR	Annual	2021	2022
	Rapid River	ABV W FK	CORA CLIFF	Annual	2021	2022
	Rapid River	ABV W FK	PARADISE	Annual	2021	2022
	Rapid River	BLW W FK	CLIFF HANG	Annual	2021	2022
Independent Population Total:			7			
	South Fork Salmon River	---	BLW HAMILTON	Opportunistic	2021	
Independent Population Total:			1			
Secesh River (SFSEC-s)	Lick Creek	---	L1	Opportunistic	2021	
Independent Population Total:			1			
Lower Middle Fork Salmon River	Camas Creek	---	Upper	Annual	2021	2022
(Loon Creek and below; MFBIG-s)	Middle Fork Salmon River	Lower	CLIFPL	Annual	2021	2022
	Middle Fork Salmon River	Lower	HANPOL	Annual	2021	2022
	Middle Fork Salmon River	Middle	AIRSTP	Biennial	2021	2023
Independent Population Total:			4			
Upper Middle Fork Salmon River	Indian Creek	---	Lower	Annual	2021	2022
(above Loon Creek; MFUMA-s)	Indian Creek	---	Upper	Annual	2021	2022
	Middle Fork Salmon River	Upper	Mahoney Camp	Annual	2021	2022
	Middle Fork Salmon River	Middle	WCPB	Annual	2021	2022
	Middle Fork Salmon River	Upper	LICRGS	Annual	2021	2022
Independent Population Total:			5			
Panther Creek (SRPAN-s)	Panther Creek	DS Clear	PC-1	Opportunistic	2021	

Appendix A2. Continued.

Steelhead major and independent population	Stream name	Stratum	Transect name	Survey frequency	Last surveyed	Next scheduled survey
	Panther Creek	Above	US Cabin Cr	Opportunistic	2021	
Independent Population Total:			2			
Lemhi River (SRLEM-s)	Big Springs Creek	---	BSC BRIDGE	Annual	2021	2022
	Lemhi River	LEM2	B	Biennial	2021	2023
Independent Population Total:			2			
Pahsimeroi River (SRPAH-s)	Pahsimeroi River	1	Ponds	Annual	2021	2022
	Pahsimeroi River	Weir	Weir	Annual	2021	2022
Independent Population Total			2			
Upper Salmon River (SRUMA-s)	Hannah Slough	---	UPS Garden Cr	Annual	2019	2022
	Thompson Creek	Below	1	Opportunistic	2021	
Independent Population Total:			2			
MPG Total:			27			
Snake River DPS Total			104			

Appendix A3. IDFG resident fish trend snorkel survey transects n = 26 by Snake River steelhead major population group (bold) and independent population. Middle Fork Salmon River and its tributaries were surveyed by regional management crews funded by the Dingell-Johnson Act and License funds.

Steelhead major and independent population	Stream name	Stratum	Transect name	Survey frequency	Last surveyed	Next scheduled survey
Clearwater River						
South Fork Clearwater River (CRSFC-s)	Crooked River	1	SILL-LOG-A	Triennial	2021	2024
	Moores Creek	---	2	Triennial	2021	2024
Independent Population Total:			2			
Lochsa River (CRLOC-s)	Squaw Cr (Waw'aalamnime)	---	7	Annual	2021	2022
Independent Population Total:			1			
Selway River (CRSEL-s)	Little Clearwater River	---	1	Annual	2021	2022
	Little Clearwater River	---	2	Annual	2021	2022
	North Fork Moose Creek	---	4	Annual	2021	2022
	Selway River	---	BEAVERPT	Annual	2021	2022
Independent Population Total:			4			
MPG Total:			7			
Salmon River						
South Fork Salmon River (SFMAI-s)	East Fork South Fork Salmon	ABV JHNSN	SUGAR CR	Biennial	2021	2023
	East Fork South Fork Salmon	BLW JHNSN	MP 35.8	Biennial	2021	2023
Independent Population Total:			2			
Secesh River (SFSEC-s)	Secesh River	---	U-SCSH-MDW	Annual	2021	2023
Independent Population Total:			1			
Lower Middle Fork Salmon River	Big Creek	UPPER	NEAR FORD	Biennial	2021	2023
(Loon Creek and below; MFBIG-s)	Camas Creek	---	1	Triennial	2016	2022
	Camas Creek	---	L1-MOUTH	Annual	2021	2022
	Loon Creek	---	L1-BRIDGE	Annual	2021	2022
	Loon Creek	---	L2-RUN	Annual	2021	2022
Independent Population Total:			5			
Upper Middle Fork Salmon River	Bear Valley Creek	1	A	Triennial	2021	2024
(above Loon Creek; MFUMA-s)	Bear Valley Creek	2	B	Triennial	2021	2024
	Bear Valley Creek	3	A	Triennial	2021	2024
	Bear Valley Creek	9	B	Triennial	2021	2024
	Marble Creek	Lower	L1	Annual	2021	2023
	Pistol Creek	---	L1/Lower	Annual	2021	2023
	Pistol Creek	---	L2/Upper	Annual	2021	2023
Independent Population Total:			7			
Panther Creek (SRPAN-s)	Panther Creek	Above	PC10	Annual	2021	2022

Appendix A3. Continued

Steelhead major and independent population	Stream name	Stratum	Transect name	Survey frequency	Last surveyed	Next scheduled survey
Independent Population Total:			1			
Lemhi River (SRLEM-s)	Bear Valley Creek	HC1	B-LOWER	Triennial	2021	2024
	Bear Valley Creek	HC1	CAMP	Triennial	2021	2024
Independent Population Total:			2			
Upper Salmon River (SRUMA-s)	Thompson Creek	ABOVE	TWO-POLE	Biennial	2021	2023
Independent Population Total:			1			
MPG Total:			19			
Snake River DPS Total:			26			

APPENDIX B: SALMONID DENSITIES OBSERVED BY SNORKELING IN IDFG CORE TRANSECTS, 2021

Appendix B1. Densities (fish/100 m^2) of salmonids observed in 2021 at 48 core trend transects snorkeled throughout the Clearwater River basin, Idaho. Trout fry = all trout <50 mm that could not be distinguished between steelhead and Westslope Cutthroat Trout. Dashes represent transects in which no fish of a given type were observed. Transect names separated by a slash indicated stratum and transect names. Transects with no slash indicate systems in which only one strata is present.

		Density (Fish/100 m^2)								
Stream	**Transect**	**Trout fry**	**Steelhead**	**Chinook salmon**	**WS cutthroat trout**	**Bull trout**	**Brook trout**	**Whitefish**	**Visibility (m)**	**Temp (C)**
American River	2/1	-	-	-	-	-	1.76	-	2.0	21.3
American River	3/2	-	0.40	4.72	0.13	-	0.61	0.07	1.3	24.0
Big Canyon	1	29.47	8.99	0.40	-	-	-	-	1.3	17.0
Crooked River	1/BOULDER-A	0.21	-	-	3.83	0.43	0.43	0.43	1.4	14.9
Crooked River	1/BOULDER-B	-	-	-	1.50	-	-	-	2.1	16.0
Crooked River	1/SILL LOG-B	-	0.71	-	0.95	0.24	-	0.24	2.4	16.0
Crooked River	2/CONTROL1	-	0.16	-	1.40	-	-	-	1.2	14.5
Crooked River	2/CONTROL2	-	0.62	-	0.53	-	-	0.35	1.3	16.0
Crooked River	2/TREAT2	-	0.84	-	0.56	-	-	0.65	1.6	15.9
Crooked River	3/NATURAL1	0.51	-	-	0.66	-	-	1.03	1.2	14.5
Crooked River	C/CAN2	-	0.30	-	1.21	-	-	1.21	1.0	16.0
Crooked River	C/CAN3	-	0.48	-	0.32	-	-	3.36	1.9	14.3
Deep Creek	CACTUS	1.20	2.61	-	3.81	0.20	-	-	2.1	17.3
Deep Creek	SCIMITAR	-	4.41	-	5.76	-	-	-	2.4	17.5
E. F. Crooked River	H/EF1	-	-	-	3.86	0.32	-	-	2.8	14.0
Fish Creek	1	2.90	2.80	0.05	1.00	-	-	-	3.8	17.3
Fish Creek	2	4.46	4.35	-	0.87	-	-	-	4.0	20.1
John's Creek	1/1	5.13	1.55	-	0.49	-	-	0.81	1.9	17.7
John's Creek	2/3	-	1.70	-	1.51	0.09	-	-	1.4	11.0
Lochsa River	L1	-	-	0.02	0.02	-	-	0.02	2.4	21.0
Lochsa River	L2	-	-	-	-	-	-	0.03	1.7	22.4
Lochsa River	L3	-	-	-	0.08	-	-	0.20	2.1	17.5
Lochsa River	L4	0.12	0.02	0.56	0.51	-	-	-	2.1	17.2
Meadow Creek	1	-	0.96	1.66	0.45	0.06	-	0.51	2.1	16.8
Old Man Creek	1	15.12	0.90	3.36	2.24	-	-	0.56	4.3	16.0
Post Office Creek	1	5.05	1.20	-	6.26	0.24	-	-	3.4	15.1
Post Office Creek	2	11.14	1.22	-	3.65	0.61	-	-	2.1	15.5
Red River	1/CNTL 1	-	-	13.43	-	-	4.64	-	1.3	12.2
Red River	1/CNTL 2	-	-	0.18	-	-	1.84	-	1.3	15.0
Red River	2/CNTL 2	-	0.12	4.07	-	-	2.10	-	1.9	18.0

Appendix B1. Continued.

		Density (Fish/100 m^2)								
Stream	**Transect**	**Trout fry**	**Steelhead**	**Chinook salmon**	**WS cutthroat trout**	**Bull trout**	**Brook trout**	**Whitefish**	**Visibility (m)**	**Temp (C)**
Red River	2/TREAT 2	-	-	8.31	0.27	0.14	0.55	-	1.9	18.0
Red River	4/CNTL 2	-	0.07	80.85	0.28	-	1.96	0.49	1.7	19.0
Red River	4/TREAT 2	-	-	54.38	0.07	0.07	1.33	0.20	1.7	19.4
Red River	5/CNTL 2	-	-	10.79	-	-	0.83	-	3.1	20.8
Red River	5/TREAT 2	-	-	4.10	0.06	-	0.50	0.50	3.1	20.8
Relief Creek	1/1A	1.14	1.43	-	2.29	0.29	-	-	1.7	15.8
Relief Creek	1/1B	0.36	5.42	-	4.34	-	-	-	1.3	15.0
Selway River	HELLSHALF	1.05	0.86	2.30	2.40	-	-	2.68	3.0	14.0
Selway River	LITTLE-CW	0.16	3.02	1.83	1.90	0.08	-	3.33	2.8	20.0
Selway River	MAG-XING	0.77	0.95	0.86	0.43	0.03	-	0.31	3.2	16.2
Tenmile Creek	1	-	-	7.17	-	-	2.48	-	2.0	12.9
Warm Springs Creek	1	0.58	0.13	-	0.04	-	-	-	2.3	16.1
W. F. Crooked River	H/WF1	0.27	0.54	-	2.45	0.54	0.54	-	2.0	15.0
W. F. Crooked River	H/WF2	-	0.37	-	0.74	-	-	-	1.6	14.0
White Cap Creek	3/1	1.02	1.29	0.20	1.22	-	-	0.14	7.0	23.0
White Cap Creek	3/2	2.34	0.37	1.05	0.80	-	-	-	5.2	21.4
White Cap Creek	3/3	0.96	0.70	0.32	1.15	-	-	-	5.2	18.4
White Sands Creek	LWRMONITOR	0.45	0.05	0.15	0.03	-	-	-	2.5	20.5
	Mean	**1.8**	**1.0**	**4.2**	**1.3**	**0.1**	**0.4**	**0.4**	**2.4**	**17.1**
	Standard Deviation	**5.0**	**1.7**	**13.9**	**1.6**	**0.2**	**0.9**	**0.8**	**1.2**	**2.9**
	Proportion Occupied	**0.5**	**0.7**	**0.5**	**0.8**	**0.3**	**0.3**	**0.4**		

Appendix B2. Densities (fish/100 m^2) of salmonids observed in 2021 at 89 core transects snorkeled throughout the Salmon River basin, Idaho. Trout fry = all trout <50 mm that could not be distinguished between steelhead and Westslope Cutthroat Trout. Dashes represent transects in which no fish of a given type were observed. Transect names separated by a slash indicated stratum and transect names. Transects with no slash indicate systems in which only one strata is present.

		Density (Fish/100 m^2)								
Stream	**Transect**	**Trout fry**	**Steelhead**	**Chinook salmon**	**WS cutthroat trout**	**Bull trout**	**Brook trout**	**Whitefish**	**Visibility (m)**	**Temp (°C)**
Boulder Creek	ABOVE/1	-	1.98	-	-	-	9.23	-	2.6	17.4
Boulder Creek	ABOVE/2	0.19	3.09	-	-	0.19	1.93	-	1.0	18.0
Boulder Creek	BELOW/3	13.61	21.35	27.75	0.53	-	-	-	1.4	19.4
Boulder Creek	BELOW/5	6.40	12.29	0.17	0.17	0.50	-	-	NA	19.0
Elk Creek	1A	0.08	-	15.20	-	-	10.08	31.41	3.3	17.0
Elk Creek	1B	0.52	-	9.24	-	-	5.32	42.82	2.7	17.1
Elk Creek	2A	0.51	-	0.62	-	-	0.11	0.62	3.2	12.8
Elk Creek	2B	0.78	-	2.27	-	-	19.80	18.23	2.9	15.2
Hazard Creek	HAZ1	5.96	17.17	0.38	-	-	-	-	2.4	18.3
Lake Creek	BURGDORF	-	0.29	13.18	-	-	0.14	-	2.3	17.8
Lake Creek	WILLOW CR	-	-	0.55	-	-	0.37	-	2.0	20.1
Lick Creek	L3	22.65	9.85	-	0.16	-	-	-	2.7	17.3
Little Salmon River	1	0.96	11.25	2.00	0.15	3.11	0.07	-	0.9	17.9
Little Salmon River	2	0.29	2.97	0.29	-	3.48	-	0.80	1.8	21.4
Secesh River	GROUSE	-	0.08	2.17	-	0.08	-	0.17	1.8	17.0
Secesh River	LONG-GULCH	0.03	0.07	0.53	-	-	-	0.23	1.8	14.3
SF Salmon River	5	-	0.11	0.34	-	-	-	0.69	2.5	19.4
SF Salmon River	7	-	-	1.78	-	-	-	1.78	2.2	17.7
SF Salmon River	11	0.14	2.47	5.69	-	-	-	3.59	1.9	22.2
SF Salmon River	14	-	0.29	0.58	-	-	-	2.60	1.5	19.8
SF Salmon River	16	1.47	3.32	2.76	0.07	-	-	4.16	1.8	23.5
SF Salmon River	POVERTY	0.20	0.10	5.88	-	-	-	0.15	2.1	16.5
SF Salmon River	STOLLE1	0.05	-	-	-	-	-	0.18	3.9	13.0
SF Salmon River	STOLLE2	0.22	-	0.49	-	-	-	0.27	2.0	20.0
WF Rapid River	BLW FALLS/RAP1	2.45	7.53	0.16	0.65	1.14	-	-	NA	NA
NF Salmon River	HUGHES	-	-	-	-	-	-	-	2.1	16.0
NF Salmon River	DAHLONEGA	0.10	7.39	1.65	0.30	-	0.20	0.20	2.7	16.0
Panther Creek	PC1	-	1.05	-	-	-	-	9.25	1.8	19.0
Pine Creek	BRIDGE	1.35	10.81	-	-	-	-	-	1.0	13.5
Pine Creek	SAWMILL CR	-	6.72	1.92	-	-	-	-	1.9	13.0
Panther Creek	PC6	0.45	1.00	0.67	0.11	-	-	0.44	1.5	23.0

Appendix B2. Continued.

		Density (Fish/100 m^2)								
Stream	**Transect**	**Trout fry**	**Steelhead**	**Chinook salmon**	**WS cutthroat trout**	**Bull trout**	**Brook trout**	**Whitefish**	**Visibility (m)**	**Temp (°C)**
Panther Creek	PC9	5.29	15.55	4.23	2.10	-	-	0.35	1.0	17.0
Panther Creek	PC10	-	0.45	-	0.45	-	1.35	-	0.8	14.0
Panther Creek	PC4	0.10	0.20	-	-	0.10	-	0.30	1.3	13.0
Alturas Lake Creek	2B	0.08	-	0.08	-	0.16	0.56	0.40	5.0	19.0
Beaver Creek	1A	-	0.21	4.40	-	-	-	0.07	2.7	17.0
Beaver Creek	3B	-	-	1.79	-	-	0.17	-	9.9	19.5
Cape Horn Creek	1A	-	-	36.69	-	-	0.13	-	8.3	14.0
Cape Horn Creek	2B	-	-	23.63	-	0.13	0.26	-	5.7	13.0
Knapp Creek	1B	-	-	0.19	-	0.39	1.53	-	2.9	15.0
Knapp Creek	1A	0.49	-	26.23	-	-	0.81	0.49	4.8	25.0
Knapp Creek	LCKD FENCE	12.71	-	-	-	0.17	-	-	4.3	24.0
Marsh Creek	1A	-	-	7.40	0.05	-	-	1.98	1.5	9.0
Marsh Creek	1B	-	0.21	2.20	-	-	-	3.72	3.0	10.0
Marsh Creek	3A	-	0.19	30.53	-	-	1.73	1.54	4.8	20.0
Marsh Creek	4B	1.96	-	0.52	-	-	-	5.47	5.2	16.0
Marsh Creek	5A	-	-	4.66	-	-	-	-	9.1	11.0
Morgan Creek	BLM CAMP	-	2.43	-	0.63	-	-	-	1.2	19.5
Redfish Lake Creek	WEIR DS	-	0.30	-	0.04	-	-	1.01	5.8	22.0
Redfish Lake Creek	LOWER	-	0.85	0.05	-	-	-	0.05	4.2	26.0
Salmon River	3BRA	-	-	-	-	-	-	-	2.0	14.0
Salmon River	7A	0.22	0.22	-	-	-	0.55	5.04	4.5	21.0
Salmon River	4B	0.47	0.19	-	0.06	-	-	0.65	4.7	12.0
Salmon River	3B	0.52	0.30	1.26	-	-	-	-	3.6	20.0
Salmon River	2B	0.07	0.50	2.74	0.14	-	-	0.82	3.0	12.0
Salmon River	RBNSN-BAR	0.01	0.22	0.17	0.02	-	-	0.31	1.5	18.0
Valley Creek	6B	0.15	0.75	1.50	0.30	0.15	0.75	-	5.0	18.0
Valley Creek	1B	4.86	0.35	42.05	0.21	-	-	1.79	1.8	22.0
Valley Creek	3B	0.13	0.13	3.99	-	-	-	0.13	2.1	23.0
Valley Creek	3A	1.08	1.00	8.77	-	-	0.07	3.70	2.9	24.0
MF Salmon River	WHITEYCX	-	0.38	-	0.75	-	-	-	1.1	18.5
MF Salmon River	BIG-CR-BR	-	0.10	-	0.30	-	-	7.15	1.3	18.5
MF Salmon River	SKIJUMP	-	-	0.06	-	-	-	0.29	2.7	19.0
MF Salmon River	LJACKASS	-	-	-	0.80	-	-	0.38	2.9	20.5
MF Salmon River	COUGAR	-	0.26	-	0.26	-	-	0.10	2.0	16.5
MF Salmon River	PUNGO	-	0.49	-	0.49	-	-	0.38	2.0	17.0
MF Salmon River	ROCK IS	-	-	-	0.16	-	-	0.19	2.5	18.5

Appendix B2. Continued.

		Density (Fish/100 m^2)								
Stream	**Transect**	**Trout fry**	**Steelhead**	**Chinook salmon**	**WS cutthroat trout**	**Bull trout**	**Brook trout**	**Whitefish**	**Visibility (m)**	**Temp (°C)**
MF Salmon River	INDIAN	-	0.38	-	1.63	-	-	1.91	1.9	16.0
MF Salmon River	GOATPOOL	-	-	-	-	-	-	-	1.4	19.0
MF Salmon River	GREYHOUND	-	0.46	0.23	1.49	-	0.10	1.14	2.1	17.5
MF Salmon River	RAPID-R	-	1.55	2.11	3.24	-	-	1.19	2.3	18.0
MF Salmon River	LITOUZEL	-	0.19	0.19	0.38	-	-	-	1.5	18.0
MF Salmon River	SHEEPEATER	-	1.33	-	0.31	-	-	1.14	0.0	17.0
MF Salmon River	GRDLHOLE	-	0.32	2.86	-	-	-	0.57	4.3	14.0
MF Salmon River	VELVET	-	2.89	1.78	-	-	-	0.19	3.0	16.0
MF Salmon River	FLYING-B	-	-	0.18	-	-	-	-	1.9	19.0
MF Salmon River	TAPPANPOOL	-	0.19	0.58	0.29	-	-	0.95	1.9	19.0
MF Salmon River	SURVEY	-	0.24	-	0.24	-	-	-	1.4	18.0
MF Salmon River	LOVEBAR	-	0.14	-	-	-	-	4.00	1.8	18.5
MF Salmon River	SHIPISLAND	-	-	-	0.53	-	-	0.19	1.3	18.5
MF Salmon River	ELKHORN	-	0.85	-	0.28	-	-	1.14	2.6	16.0
MF Salmon River	HOSPRUN	-	-	3.72	0.60	-	-	0.48	1.9	21.0
MF Salmon River	OTTERBAR	-	-	-	0.21	-	-	-	1.7	20.5
MF Salmon River	AIRSTRIP	-	0.45	-	0.30	-	-	0.76	1.6	19.0
MF Salmon River	HOSPPL	-	0.16	-	-	-	-	-	1.9	21.0
MF Salmon River	MARBLPL	-	-	-	1.68	-	-	3.62	2.1	18.5
MF Salmon River	GOATRUN	-	0.26	-	-	-	-	0.29	1.5	19.0
MF Salmon River	BOUNDARY	-	3.91	-	1.72	0.48	-	2.57	4.3	20.0
Big Creek	L1	-	0.84	-	1.01	-	-	2.85	2.1	15.0
	Mean	**1.0**	**1.8**	**3.5**	**0.3**	**0.1**	**0.6**	**2.0**	**2.7**	**17.6**
	Standard Deviation	**3.2**	**4.0**	**8.1**	**0.5**	**0.5**	**2.6**	**6.0**	**1.7**	**3.8**
	Proportion Occupied	**0.4**	**0.7**	**0.6**	**0.4**	**0.2**	**0.3**	**0.7**		

Appendix B3. Densities (fish/100 m^2) of salmonids observed in 2021 at four core trend transects snorkeled throughout the Hells Canyon portion of the Snake River basin, Idaho. Trout fry = all trout <50 mm that could not be distinguished between steelhead and Westslope Cutthroat Trout. Dashes represent transects in which no fish of a given type were observed. Transect names separated by a slash indicated stratum and transect names. Transects with no slash indicate systems in which only one strata is present.

		Density (Fish/100 m^2)								
Stream	**Transect**	**Trout fry**	**Steelhead**	**Chinook salmon**	**WS cutthroat trout**	**Bull trout**	**Brook trout**	**Whitefish**	**Visibility (m)**	**Temp (C)**
Granite Creek	1	11.87	8.57	0.33	-	-	-	-	0.8	14.4
Granite Creek	3	2.97	5.62	-	-	-	-	-	3.0	13.6
Sheep Creek	1	10.00	30.73	-	-	-	-	-	2.0	16.7
Sheep Creek	2	19.16	13.26	13.76	4.91	-	-	-	1.5	16.0
	Mean	**11.0**	**14.6**	**3.5**	**1.2**	**0.0**	**0.0**	**0.0**	**1.8**	**15.2**
	Standard Deviation	**6.7**	**11.2**	**6.8**	**2.5**	**0.0**	**0.0**	**0.0**	**0.9**	**1.4**
	Proportion Occupied	**1.0**	**1.0**	**0.5**	**0.3**	**0.0**	**0.0**	**0.0**		

APPENDIX C: SALMONID DENSITIES OBSERVED BY SNORKELING IN IDFG NON-CORE TRANSECTS, 2021

Appendix C1. Densities (fish/100 m^2) of salmonids observed in 2021 at eight non-core transects snorkeled throughout the Clearwater River basin, Idaho. Trout fry = all trout <50 mm that could not be distinguished between steelhead and Westslope Cutthroat Trout. Dashes represent transects in which no fish of a given type were observed. Transect names separated by a slash indicated stratum and transect names. Transects with no slash indicate systems in which only one strata is present.

		Density (Fish/100 m^2)								
Stream	**Transect**	**Trout fry**	**Steelhead**	**Chinook salmon**	**WS cutthroat trout**	**Bull trout**	**Brook trout**	**Whitefish**	**Visibility (m)**	**Temp (C)**
E. F. Potlatch	99-1	-	-	-	-	-	0.27	-	1.0	12.0
E. F. Potlatch	99-2	0.63	0.21	-	-	-	0.21	-	1.1	12.0
E. F. Potlatch	99-3	-	-	-	-	-	-	-	1.3	11.0
E. F. Potlatch	PFI4	-	0.62	-	-	-	3.12	-	1.2	11.0
E. F. Potlatch	PFI5	-	0.94	-	-	-	9.92	-	3.0	14.3
E. F. Potlatch	PFI7	0.49	2.94	-	-	-	5.88	-	2.0	13.5
E. F. Potlatch	PFI8	0.64	0.21	-	-	-	1.27	-		12.4
E. F. Potlatch	PFI9	-	-	-	-	-	-	-	1.1	12.0
	Mean	**0.2**	**0.6**	**0.0**	**0.0**	**0.0**	**2.6**	**0.0**	**1.5**	**12.3**
	Standard Deviation	**0.3**	**1.0**	**0.0**	**0.0**	**0.0**	**3.6**	**0.0**	**0.7**	**1.1**
	Proportion Occupied	**0.4**	**0.6**	**0.0**	**0.0**	**0.0**	**0.8**	**0.0**		

Appendix C2 Densities (fish/100 m^2) of salmonids observed in 2021 at 26 non-core transects snorkeled throughout the Salmon River basin, Idaho. Trout fry = all trout <50 mm that could not be distinguished between steelhead and Westslope Cutthroat Trout. Dashes represent transects in which no fish of a given type were observed. Transect names separated by a slash indicated stratum and transect names. Transects with no slash indicate systems in which only one strata is present.

		Density (Fish/100 m^2)								
Stream	**Transect**	**Trout fry**	**Steelhead**	**Chinook salmon**	**WS cutthroat trout**	**Bull trout**	**Brook trout**	**Whitefish**	**Visibility (m)**	**Temp (C)**
Big Springs Creek	1/BSC BRIDGE	0.15	0.30	0.15	-	-	0.31	0.15	2.0	9.0
Camas Creek	UPPER	-	6.40	-	3.20	-	-	11.74	0.0	0.0
Hazard Creek	HAZ2	9.08	15.55	0.52	-	-	-	-	2.2	17.2
Indian Creek	UPPER	-	0.48	0.16	-	-	-	-	3.1	16.0
Indian Creek	LOWER	-	0.82	-	0.70	-	-	0.12	2.8	17.0
Lemhi River	LEM2/B	-	-	-	-	-	-	-	1.8	10.0
Lick Creek	L1	19.83	7.44	0.67	0.10	-	1.33	0.19	2.3	20.3
MF Salmon River	Lower/HANPOL	-	-	-	-	-	-	0.22	1.3	19.0
MF Salmon River	Middle/AIRSTP	-	0.45	-	0.30	-	-	0.76	1.5	19.0
MF Salmon River	Middle/WCPB	-	0.25	-	0.13	-	-	0.50	2.0	19.0
MF Salmon River	UPPER/LICRGS	-	0.21	-	0.21	-	-	0.53	2.8	20.0
MF Salmon River	UPPER/MAHONEY CAMP	-	-	-	2.22	-	-	0.37	1.4	18.0
MF Salmon River	Lower/CLIFPL	-	-	-	-	-	-	-	1.5	18.5
Pahsimeroir River	1/PONDS	5.55	8.29	16.32	-	-	1.32	0.66	1.3	15.0
Pahsimeroir River	WEIR/WEIR	-	2.53	2.30	-	-	-	0.68	0.9	15.0
Rapid River	ABV W FK/4	0.96	3.23	0.08	-	-	-	-	3.3	15.5
Rapid River	ABV W FK/CASTLE CREEK	-	11.55	-	0.22	0.34	-	-	3.4	11.7
Rapid River	ABV W FK/COPPER CR	-	6.29	-	0.11	0.56	-	-	2.4	13.4
Rapid River	ABV W FK/CORA CLIFF	1.35	7.13	1.35	-	0.48	-	-	3.5	15.9
Rapid River	ABV W FK/PARADISE	-	3.11	0.49	0.12	1.22	-	-	2.4	13.2
Rapid River	BLW W FK/CLIFF HANG	1.52	6.06	-	-	0.18	-	-	2.1	13.9
South Fork Salmon River	BLW HAMILTON	0.15	0.40	0.23	0.15	0.00	-	-	2.0	20.5
Thompson Creek	BELOW/1	-	3.69	-	-	-	-	0.21	3.5	20.0
Wind River	BELFA113PL	1.59	14.22	-	0.11	0.11	-	-	2.0	NA
Wind River	1ST BRIDGE	3.05	18.67	-	-	-	-	-	2.6	NA
Wind River	PLABVFALLS	0.71	8.27	-	-	-	-	-	3.1	NA
	Mean	**1.7**	**4.8**	**0.9**	**0.3**	**0.1**	**0.1**	**0.6**	**2.1**	**15.3**
	Standard Deviation	**4.2**	**1.1**	**0.6**	**0.1**	**0.1**	**0.1**	**0.4**	**0.2**	**1.0**
	Proportion Occupied	**0.4**	**0.8**	**0.4**	**0.4**	**0.2**	**0.1**	**0.5**		

Appendix C3 Densities (fish/100 m^2) of salmonids observed in 2021 at six resident trend transects snorkeled throughout the Clearwater River basin, Idaho. Trout fry = all trout <50 mm that could not be distinguished between steelhead and Westslope Cutthroat Trout. Dashes represent transects in which no fish of a given type were observed.

		Density (Fish/100 m^2)								
Stream	**Transect**	**Trout fry**	**Steelhead**	**Chinook salmon**	**WS cutthroat trout**	**Bull trout**	**Brook trout**	**Whitefish**	**Visibility (m)**	**Temp (C)**
Crooked River	1/SILL-LOG-A	-	1.38	-	3.32	0.28	0.14	0.28	1.4	14.3
Little Clearwater River	1	0.53	3.45	0.80	2.12	-	-	-	2.3	16.0
Little Clearwater River	2	3.11	2.94	0.69	-	0.17	-	0.52	2.3	16.0
Moores Creek	2	-	-	-	3.59	0.22	-	-	2.2	13.3
Selway River	BEAVERPT	0.75	2.35	8.29	1.55	-	-	0.85	3.0	17.8
Waw'aalamnine Creek	7	12.16	0.18	-	1.84	0.18	-	0.18	2.5	16.0
	Mean	**2.8**	**1.7**	**1.6**	**2.1**	**0.1**	**0.0**	**0.3**	**2.3**	**15.6**
	Standard Deviation	**4.8**	**1.4**	**3.3**	**1.3**	**0.1**	**0.1**	**0.3**	**0.5**	**1.6**
	Proportion Occupied	**0.7**	**0.8**	**0.5**	**0.8**	**0.7**	**0.2**	**0.7**		

Appendix C4. Densities (fish/100 m^2) of salmonids observed in 2021 at 30 resident trend transects snorkeled throughout the Salmon River basin, Idaho. Trout fry = all trout <50 mm that could not be distinguished between steelhead and Westslope Cutthroat Trout. Dashes represent transects in which no fish of a given type were observed. Transect names separated by a / indicated stratum and transect names. Transects with no / indicate systems in which only one strata is present.

		Density (Fish/100 m^2)								
Stream	**Transect**	**Trout Fry**	**Steelhead**	**Chinook salmon**	**WS cutthroat trout**	**Bull trout**	**Brook trout**	**Whitefish**	**Visibility (m)**	**Temp (C)**
Bear Valley Creek	HC-1/CAMP	-	-	-	-	0.46	-	-	1.9	8.0
Bear Valley Creek	HC-1/B-LOWER	-	-	-	-	0.44	-	-	1.7	10.0
Bear Valley Creek	1A	-	0.13	2.10	-	-	-	2.06	2.3	16.3
Bear Valley Creek	2B	0.25	0.10	1.92	-	-	0.12	1.76	2.4	17.3
Bear Valley Creek	3A	1.02	-	4.61	-	-	8.60	8.50	2.7	16.8
Bear Valley Creek	9B	-	-	1.03	-	-	0.82	-	2.3	12.5
Big Creek	NEAR FORD	0.81	0.10	11.91	-	0.20	0.30	-	3.9	13.5
Camas Creek	1	2.01	1.63	1.66	0.58	-	0.08	3.46	2.7	21.0
Camas Creek	L1-Mouth	-	1.12	0.20	5.52	2.22	0.20	11.31	1.7	21.0
East Fork South Fork Salmon River	ABV JHNSN -> SUGAR	0.10	0.67	0.98	0.96	0.18	-	8.11	2.0	17.1
East Fork South Fork Salmon River	BLW JHNSN -> MP 35.8	2.58	0.26	0.90	1.16	2.45	-	0.65	2.6	15.6
Gold Fork River	Pasture Site	-	-	-	-	-	-	-	3.1	16.3
Gold Fork River	Plunge Pool	-	0.19	-	-	-	-	1.08	1.3	14.0
Gold Fork River	Bridge w/Access	-	0.07	-	-	-	-	-	1.9	12.2
Gold Fork River	Below Gold Fork Hot Springs	0.12	-	-	-	-	-	-	1.7	15.2
Gold Fork River	Bridge Site	0.07	0.09	-	-	-	-	1.03	1.4	14.0
Lake Fork	Rolands Pond	-	0.07	-	-	-	-	-	2.5	14.3
Lake Fork	Lake Fork Creek Rd	0.98	1.63	-	-	-	1.14	0.57	1.4	21.0
Lake Fork	Lower Bridge	0.10	1.10	-	-	-	-	9.60	2.2	16.8
Loon Creek	L1-Bridge	-	1.50	-	3.00	-	-	2.70	1.6	9.0
Loon Creek	L2-Run	-	-	-	3.04	-	-	4.77	1.6	19.0
Marble Creek	LOWER/L1	-	4.34	-	-	-	-	-	2.0	21.5
NF Payette River	Smylie Ln Bridge	0.28	0.80	-	-	-	-	7.81	2.2	18.0
NF Payette River	Sheep Bridge Hole	0.82	0.53	-	-	-	-	3.94	1.8	17.3
NF Payette River	Sheep Bridge Hole 2	0.26	0.47	-	-	-	0.13	9.46	2.3	17.8
NF Payette River	Big Hole	4.40	0.49	-	-	-	0.20	10.79	3.4	19.4
Panther Creek	Above/PC10	-	0.45	-	0.45	-	1.35	-	0.8	14.0
Pistol Creek	L1	-	3.15	16.81	2.10	-	-	2.62	1.7	19.0
Pistol Creek	L2	-	0.98	6.91	0.99	0.32	-	-	1.9	19.0
Thompson Creek	ABOVE/TWO-POLE	0.16	2.10	-	-	-	-	-	1.7	18.0

Appendix C4. Continued.

Mean	**0.5**	**0.7**	**1.6**	**0.6**	**0.2**	**0.4**	**3.0**	**2.1**	**16.2**
Standard Deviation	**1.0**	**1.0**	**3.8**	**1.3**	**0.6**	**1.6**	**3.8**	**0.7**	**3.5**
Proportion Occupied	**0.5**	**0.8**	**0.4**	**0.3**	**0.2**	**0.3**	**0.6**		

APPENDIX D: SALMONID DENSITIES OBSERVED BY SNORKELING IN IDFG INTENSIVE PANEL TRANSECTS, 2021

Appendix D1. Densities (fish/100 m^2) of salmonids observed in 2021 at 64 intensive panel transects snorkeled throughout the Potlatch River basin, Idaho. Trout fry = all trout <50 mm that could not be distinguished between steelhead and Westslope Cutthroat Trout. Dashes represent transects in which no fish of a given type were observed.

		Density (Fish/100 m^2)								
Stream	**Transect**	**Trout fry**	**Steelhead**	**Chinook salmon**	**WS cutthroat trout**	**Bull trout**	**Brook trout**	**Whitefish**	**Visibility (m)**	**Temp (C)**
Big Bear Creek	30690	-	-	-	-	-	-	-	1.0	15.0
Big Bear Creek	91154	-	-	-	-	-	-	-	1.6	18.0
Big Bear Creek	106514	-	-	-	-	-	-	-	1.3	16.4
Big Bear Creek	107538	-	-	-	-	-	-	-	1.7	15.0
Big Bear Creek	119826	-	-	-	-	-	-	-	1.7	14.0
Big Bear Creek	169954	-	-	-	-	-	-	-	1.1	15.0
Big Meadow Creek	12818	-	0.84	-	-	-	-	-	0.9	11.9
Big Meadow Creek	281106	-	0.68	-	-	-	-	-	0.8	19.0
Bloom Creek	78705	-	-	-	-	-	-	-	1.5	6.3
Bobs Creek	37745	0.37	0.37	-	-	-	4.10	-	1.5	15.0
Bobs Creek	86897	-	-	-	-	-	-	-	0.5	9.0
Bobs Creek	103281	0.80	-	-	-	-	1.99	-	2.1	16.0
East Fork Big Bear Creek	36882	-	-	-	-	-	-	-	0.9	12.1
East Fork Big Bear Creek	126946	1.11	2.79	-	-	-	-	-	1.4	10.3
East Fork Potlatch River	2929	-	0.23	-	-	-	0.23	-	1.7	NA
East Fork Potlatch River	13169	-	-	-	-	-	-	-	1.9	NA
East Fork Potlatch River	34786	-	-	-	-	-	-	-	2.0	18.0
East Fork Potlatch River	45937	-	-	-	-	-	0.16	-	2.2	10.9
East Fork Potlatch River	95089	-	-	-	-	-	2.22	-	1.6	7.0
East Fork Potlatch River	130018	0.32	0.96	-	-	-	0.11	-	1.6	11.4
East Fork Potlatch River	134001	2.77	0.55	-	-	-	0.83	-	1.1	11.5
East Fork Potlatch River	136049	-	-	-	-	-	0.20	-	0.6	16.0
East Fork Potlatch River	144241	0.27	-	-	-	-	0.27	-	1.2	10.2
East Fork Potlatch River	168817	-	-	-	-	-	0.22	-	0.7	14.0
East Fork Potlatch River	182242	-	-	-	-	-	-	-	1.8	18.0
East Fork Potlatch River	359394	-	-	-	-	-	7.63	-	1.3	23.8
East Fork Potlatch River	457698	0.81	0.49	-	-	-	0.16	-	2.0	20.0
Jackson Creek	26954	0.41	-	-	-	-	1.62	-	0.7	8.0
Jackson Creek	174050	-	-	-	-	-	4.23	-	0.5	11.0
Little Bear Creek	13330	13.43	6.18	-	-	-	-	-	2.0	14.5
Little Bear Creek	144402	38.31	6.31	-	-	-	-	-	0.5	11.0
Little Bear Creek	158226	64.10	0.64	-	-	-	-	-	0.9	13.0
Little Bear Creek	173074	10.33	10.33	-	-	-	-	-	1.3	12.0

Appendix D1. Continued.

		Density (Fish/100 m^2)								
Stream	**Transect**	**Trout fry**	**Steelhead**	**Chinook salmon**	**WS cutthroat trout**	**Bull trout**	**Brook trout**	**Whitefish**	**Visibility (m)**	**Temp (C)**
Little Bear Creek	177170	6.67	4.76	-	-	-	-	-	1.7	14.0
Pine Creek	153570	4.87	-	-	-	-	-	-	1.0	9.4
Pine Creek	181266	12.60	1.19	-	-	-	-	-	1.5	17.5
Pine Creek	229090	18.08	-	-	-	-	-	-	NA	14.0
Pine Creek	364258	2.63	-	-	-	-	-	-	1.5	15.0
Pine Creek	393698	13.04	1.20	-	-	-	-	-	1.3	17.5
Pine Creek	413410	5.88	0.53	-	-	-	-	-	2.1	17.0
Potlatch River	8210	-	0.29	-	-	-	-	-	1.6	14.4
Potlatch River	18402	10.62	9.30	-	-	-	1.33	-	1.5	18.1
Potlatch River	49170	0.98	0.30	-	-	-	-	-	1.6	15.5
Ruby Creek	31714	-	-	-	-	-	8.28	-	1.9	11.0
Ruby Creek	67554	3.24	-	-	-	-	2.16	-	1.0	14.8
Schwartz Creek	57362	-	1.98	-	-	-	-	-	1.3	9.0
Spring Valley Creek	111122	-	-	-	-	-	-	-	1.1	23.0
West Fork Little Bear Creek	60434	4.07	6.11	-	-	-	-	-	0.8	15.0
West Fork Little Bear Creek	78354	-	1.19	-	-	-	-	-	1.4	12.6
West Fork Little Bear Creek	100882	91.12	0.78	-	-	-	-	-	1.3	12.0
West Fork Little Bear Creek	136210	7.77	3.24	-	-	-	-	-	1.2	14.0
West Fork Little Bear Creek	150034	2.40	1.60	-	-	-	-	-	1.4	16.0
West Fork Little Bear Creek	224274	8.29	2.67	-	-	-	-	-	1.2	14.0
West Fork Little Bear Creek	363026	54.15	-	-	-	-	-	-	NA	12.0
West Fork Potlatch River	16354	-	-	-	-	-	1.00	-	1.6	12.8
West Fork Potlatch River	89221	-	-	-	-	-	-	-	1.5	9.7
West Fork Potlatch River	121989	1.56	4.69	-	-	-	1.56	-	1.2	7.0
West Fork Potlatch River	237538	-	4.17	-	-	-	6.96	-	1.3	13.0
West Fork Potlatch River	384133	-	-	-	-	-	3.57	-	1.0	9.0
West Fork Potlatch River	393186	-	-	-	-	-	3.94	-	1.3	15.0
West Fork Potlatch River	416901	-	-	-	-	-	-	-	0.8	11.0
West Fork Potlatch River	417762	-	-	-	-	-	2.53	-	1.1	13.1
West Fork Potlatch River	458722	-	-	-	-	-	4.58	-	1.6	17.0
West Fork Potlatch River	499682	0.99	0.43	-	-	-	0.28	-	1.8	15.3
	Mean	**6.0**	**1.2**	**0.0**	**0.0**	**0.0**	**0.9**	**0.0**	**1.3**	**13.7**
	Standard Deviation	**15.9**	**2.3**	**0.0**	**0.0**	**0.0**	**1.9**	**0.0**	**0.4**	**3.6**
	Proportion Occupied	**0.5**	**0.5**	**0.0**	**0.0**	**0.0**	**0.4**	**0.0**		

Appendix D2. Densities (fish/100 m^2) of salmonids observed in 2021 at 21 intensive panel transects snorkeled throughout the Fish Creek basin, Idaho. Trout fry = all trout <50 mm that could not be distinguished between steelhead and Westslope Cutthroat Trout. Dashes represent transects in which no fish of a given type were observed.

		Density (Fish/100 m^2)								
Stream	**Transect**	**Trout fry**	**Steelhead**	**Chinook salmon**	**WS cutthroat trout**	**Bull trout**	**Brook trout**	**Whitefish**	**Visibility (m)**	**Temp (C)**
Fish Creek	12994	-	2.71	0.13	1.39	-	-	0.06	3.5	16.6
Fish Creek	20418	0.31	1.03	-	1.02	-	-	-	3.1	15.4
Fish Creek	41666	5.70	6.59	-	1.34	0.06	-	-	2.8	20.4
Fish Creek	57378	1.65	2.05	-	2.05	-	-	-	1.9	13.1
Fish Creek	69666	-	0.64	-	2.98	-	-	-	1.8	16.0
Fish Creek	74434	3.11	4.60	-	1.35	-	-	-	3.6	21.0
Fish Creek	96194	-	-	-	1.23	-	-	-	3.6	14.6
Fish Creek	102338	-	0.18	-	0.37	-	-	-	4.1	14.2
Fish Creek	151490	2.03	1.21	-	1.59	-	-	-	2.6	16.5
Fish Creek	167874	-	0.56	-	1.04	-	-	-	3.2	17.4
Fish Creek	172738	1.01	2.19	-	1.69	-	-	-	2.7	18.2
Fish Creek	194498	-	-	-	3.64	-	-	-	3.6	15.8
Hungery Creek	17314	-	0.54	-	2.44	-	-	-	2.0	14.8
Hungery Creek	24610	-	-	-	31.67	-	-	-	1.8	18.5
Hungery Creek	33698	-	-	-	23.11	-	-	-	1.8	12.1
Hungery Creek	58050	0.83	1.56	-	0.81	-	-	-	2.5	18.1
Hungery Creek	97698	0.13	1.82	-	2.99	-	-	-	1.5	17.4
Hungery Creek	164770	0.43	-	-	6.26	-	-	-	4.4	13.5
Hungery Creek	213922	-	1.84	-	1.50	-	-	-	2.0	13.0
Willow Creek	156354	-	3.60	-	3.00	-	-	-	0.0	14.5
Willow Creek	221890	-	6.14	-	-	-	-	-	3.2	14.8
	Mean	**0.7**	**1.8**	**0.0**	**4.4**	**0.0**	**0.0**	**0.0**	**2.7**	**16.0**
	Standard Deviation	**1.4**	**2.0**	**0.0**	**7.9**	**0.0**	**0.0**	**0.0**	**1.0**	**2.4**
	Proportion Occupied	**0.4**	**0.8**	**0.1**	**0.9**	**0.1**	**0.0**	**0.1**		

Appendix D3. Densities (fish/100 m^2) of salmonids observed in 2021 at 19 intensive panel transects snorkeled throughout the Crooked River basin, Idaho. Trout fry = all trout <50 mm that could not be distinguished between steelhead and Westslope Cutthroat Trout. Dashes represent transects in which no fish of a given type were observed.

		Density (Fish/100 m^2)								
Stream	**Transect**	**Trout fry**	**Steelhead**	**Chinook salmon**	**WS cutthroat trout**	**Bull trout**	**Brook trout**	**Whitefish**	**Visibility (m)**	**Temp (C)**
Crooked River	5698	0.18	1.17	0.09	0.90	-	-	0.36	2.1	14.5
Crooked River	50754	0.90	-	-	3.10	-	0.30	0.30	0.0	13.1
Crooked River	72258	-	-	-	1.71	-	-	-	2.7	15.4
Crooked River	73282	0.30	1.21	-	0.40	-	-	1.10	1.9	16.8
Crooked River	161346	0.07	1.49	-	3.07	-	0.07	0.37	2.5	14.0
Crooked River	202306	-	0.10	-	1.42	-	-	0.20	1.9	17.0
Crooked River	243266	10.26	0.36	0.31	-	-	0.21	0.58	1.4	15.1
East Fork Crooked River	55874	-	-	-	3.40	0.34	-	-	1.7	15.1
East Fork Crooked River	219714	-	-	-	3.20	0.32	-	-	2.8	14.0
West Fork Crooked River	211522	-	-	-	4.10	0.20	-	-	2.3	12.3
West Fork Crooked River	256578	0.18	-	-	2.74	0.36	-	-	2.5	11.5
Fivemile Creek	14914	-	-	-	1.48	-	-	-	1.0	13.7
Fivemile Creek	186946	-	-	-	7.37	-	-	-	1.0	14.5
Relief Creek	124482	4.46	-	-	12.48	-	-	-	1.7	14.9
Relief Creek	181826	-	-	-	1.91	-	-	-	1.7	13.7
Relief Creek	235074	-	-	-	4.84	-	-	-	1.3	14.8
East Fork Relief Creek	58946	3.68	-	-	5.50	-	-	-	2.0	13.0
East Fork Relief Creek	157250	-	-	-	1.10	-	-	-	1.0	13.4
East Fork Relief Creek	247362	1.70	-	-	14.22	-	-	-	1.6	14.7
	Mean	**1.1**	**0.2**	**0.0**	**3.8**	**0.1**	**0.0**	**0.2**	**1.7**	**14.3**
	Standard Deviation	**2.6**	**0.5**	**0.1**	**3.8**	**0.1**	**0.1**	**0.3**	**0.7**	**1.4**
	Proportion Occupied	**0.5**	**0.3**	**0.1**	**0.9**	**0.2**	**0.2**	**0.3**		

Appendix D4. Densities (fish/100 m^2) of salmonids observed in 2021 at 20 intensive panel transects snorkeled throughout the Rapid River basin, Idaho. Trout fry = all trout <50 mm that could not be distinguished between steelhead and Westslope Cutthroat Trout. Dashes represent transects in which no fish of a given type were observed.

		Density (Fish/100 m^2)								
Stream	**Transect**	**Trout fry**	**Steelhead**	**Chinook salmon**	**WS cutthroat trout**	**Bull trout**	**Brook trout**	**Whitefish**	**Visibility (m)**	**Temp (C)**
Rapid River	15762	-	3.72	-	-	0.07	-	-	3.4	13.9
Rapid River	17298	-	6.88	-	-	0.17	-	-	3.0	11.5
Rapid River	19346	1.75	6.69	0.64	0.24	0.32	-	-	3.2	14.9
Rapid River	24658	-	-	-	-	4.70	-	-	1.0	12.0
Rapid River	62354	0.26	0.41	-	-	-	-	-	3.4	12.8
Rapid River	90194	-	-	-	-	2.58	-	-	2.5	12.9
Rapid River	126866	1.67	5.65	-	-	0.92	-	-	2.4	13.8
Rapid River	135250	-	-	-	-	3.84	-	-	1.0	12.0
Rapid River	155730	-	-	-	-	-	-	-	1.0	12.8
Rapid River	192402	0.12	2.28	-	-	0.36	-	-	2.5	13.4
Rapid River	193426	1.36	2.68	1.13	-	-	-	-	2.9	12.5
Rapid River	196690	-	0.48	-	-	2.07	-	-	2.9	10.2
Rapid River	200786	-	-	-	-	8.91	-	-	1.0	NA
Rapid River	215954	0.57	1.18	0.25	0.12	0.12	-	-	1.6	13.5
Rapid River	237650	-	-	-	-	3.27	-	-	2.5	12.1
Rapid River	294290	1.71	8.65	0.78	1.30	0.26	-	-	2.0	14.5
Rapid River	323474	0.41	2.24	-	-	0.91	-	-	2.1	12.9
Rapid River	324498	-	0.55	-	-	-	-	-	2.3	12.3
Rapid River	390034	0.13	0.77	-	-	0.12	-	-	1.7	12.7
WF Rapid River	163218	0.94	3.53	0.37	0.36	0.55	-	-	2.1	12.4
	Mean	**0.4**	**2.3**	**0.2**	**0.1**	**1.5**	**0.0**	**0.0**	**2.2**	**12.8**
	Standard Deviation	**0.7**	**2.7**	**0.3**	**0.3**	**2.3**	**0.0**	**0.0**	**0.8**	**1.1**
	Proportion Occupied	**0.5**	**0.7**	**0.3**	**0.2**	**0.8**	**0.0**	**0.0**		

Appendix D5. Densities (fish/100 m^2) of salmonids observed in 2021 at 29 intensive panel transects snorkeled throughout the South Fork Salmon River basin (above Krassel Gauge), Idaho. Trout fry = all trout <50 mm that could not be distinguished between steelhead and Westslope Cutthroat Trout. Dashes represent transects in which no fish of a given type were observed. Transect names separated by a / indicated stratum and transect names.

		Density (Fish/100 m^2)								
Stream	**Transect**	**Trout fry**	**Steelhead**	**Chinook salmon**	**WS cutthroat trout**	**Bull trout**	**Brook trout**	**Whitefish**	**Visibility (m)**	**Temp (C)**
Bear Creek	40439	-	-	1.66	-	-	-	-	2.5	13.0
Bear Creek	41975	0.20	1.38	-	0.59	-	17.52	-	2.4	12.0
Buckhorn Creek	26655	-	11.25	-	0.54	-	-	-	2.1	13.6
Buckhorn Creek	39967	0.98	5.87	-	0.14	-	-	-	1.9	16.3
Cabin Creek	43511	-	-	-	-	3.46	-	-	1.7	13.8
Cabin Creek	59895	6.02	7.23	4.09	-	0.48	3.13	-	4.5	17.2
Dollar Creek	72183	-	5.10	19.69	0.69	-	0.46	0.69	1.9	19.8
Mormon Creek	104951	-	-	-	-	5.23	-	-	2.9	14.9
Phoebe Creek	29727	3.67	6.93	0.41	-	-	0.82	-	2.9	17.2
Rice Creek	31223	-	1.15	-	-	-	-	-	1.3	10.0
SF Salmon River	543	-	0.11	0.25	-	-	-	0.49	2.4	22.8
SF Salmon River	6159	-	-	-	-	1.26	-	-	2.2	10.0
SF Salmon River	7199	0.17	0.11	0.28	-	-	-	0.68	2.2	19.0
SF Salmon River	10743	0.34	0.21	4.34	-	-	-	0.84	2.4	14.1
SF Salmon River	12831	-	0.52	0.17	-	-	-	3.30	2.7	15.7
SF Salmon River	14839	-	-	0.08	-	-	-	-	2.1	15.0
SF Salmon River	23031	0.47	0.76	-	-	0.19	0.28	-	3.5	14.2
SF Salmon River	29215	-	0.79	0.53	-	-	-	4.38	1.1	17.4
SF Salmon River	33311	0.09	-	0.03	-	-	-	0.03	0.8	19.5
SF Salmon River	44535	0.08	0.13	8.28	-	-	-	2.11	3.0	20.0
SF Salmon River	47607	0.19	0.10	-	-	-	-	-	2.0	18.2
SF Salmon River	60447	0.19	0.33	0.89	-	-	-	1.41	1.6	17.8
SF Salmon River	63991	12.01	2.60	-	-	0.37	0.25	-	2.3	17.4
SF Salmon River	73207	-	0.07	0.07	-	-	-	-	2.9	17.8
SF Salmon River	88567	0.73	2.92	0.15	-	0.29	1.90	0.44	2.0	15.7
Two-bit Creek	77303	-	1.37	-	-	-	1.03	-	2.9	13.2
Warm Lake Creek	28151	-	-	-	-	-	34.61	-	2.7	15.1
Warm Lake Creek	50167	0.65	0.32	-	-	-	13.46	-	1.9	24.6
West Fork Buckhorn Creek	56351	11.45	7.33	-	14.19	-	-	-	2.1	12.2
	Mean	**1.3**	**2.0**	**1.4**	**0.6**	**0.4**	**2.5**	**0.5**	**2.3**	**16.1**
	Standard Deviation	**3.2**	**3.0**	**4.0**	**2.3**	**1.2**	**7.4**	**1.1**	**0.7**	**3.4**
	Proportion Occupied	**0.5**	**0.8**	**0.5**	**0.2**	**0.2**	**0.3**	**0.3**		

Appendix D6. Densities (fish/100 m^2) of salmonids observed in 2021 at 29 intensive panel transects snorkeled throughout North Fork Salmon River basin, Idaho. Trout fry = all trout <50 mm that could not be distinguished between steelhead and Westslope Cutthroat Trout. Dashes represent transects in which no fish of a given type were observed.

		Density (Fish/100 m^2)									
Stream	**Transect**	**Trout fry**	**Steelhead**	**Chinook salmon**	**WS cutthroat trout**	**Bull trout**	**Brook trout**	**Whitefish**	**Cutthroat trout x rainbow trout**	**Visibility (m)**	**Temp (C)**
Dahlonega Creek	46047	0.29	2.04	-	-	-	-	-	-	1.50	15.0
Dahlonega Creek	29663	-	2.31	-	0.21	-	-	-	-	1.50	13.0
Dahlonega Creek	3039	-	0.39	-	-	-	-	-	-	1.10	11.0
Dahlonega Creek	68575	-	-	-	-	-	-	-	-	0.50	10.0
Hughes Creek	110303	0.22	5.10	-	-	-	0.44	-	-	1.75	15.0
Hughes Creek	77631	0.60	1.20	-	0.30	-	-	-	-	2.00	13.0
Hughes Creek	98015	-	3.15	-	1.26	0.42	-	-	-	1.60	14.0
Hull Creek	245471	2.63	1.98	-	-	-	-	-	-	2.10	14.0
Hull Creek	81631	2.57	10.29	-	3.85	-	2.56	-	-	0.75	14.0
Hull Creek	216895	-	1.11	-	-	-	-	-	-	0.50	14.0
Moose Creek	11743	-	4.22	-	2.24	0.28	-	-	-	1.00	15.0
NF Salmon River	20959	-	0.98	-	-	-	-	44.05	-	2.30	16.0
NF Salmon River	106207	-	4.06	-	-	-	-	1.40	-	2.70	17.0
NF Salmon River	21471	-	6.06	-	-	-	-	0.75	-	2.60	15.0
NF Salmon River	61151	-	2.43	-	-	-	-	2.18	-	1.80	13.0
NF Salmon River	93919	-	1.20	-	-	-	-	0.72	-	1.90	13.0
NF Salmon River	24287	-	0.91	0.10	0.91	-	-	-	-	2.35	15.0
NF Salmon River	118239	-	0.81	-	-	-	-	-	-	2.40	13.0
Pierce Creek	241119	0.99	3.94	-	1.48	-	-	-	-	1.20	17.0
Pierce Creek	110047	2.30	11.49	0.76	3.43	0.38	-	-	-	1.00	18.0
Pierce Creek	44511	0.49	14.36	-	1.47	-	-	-	-	1.90	14.0
North Fork Sheep Creek	44767	-	-	-	-	0.60	0.60	-	-	2.30	8.0
Sheep Creek	20191	-	-	-	0.42	0.14	-	-	-	2.00	13.0
Sheep Creek	77535	-	-	-	-	0.40	0.20	-	-	2.00	10.0
Twin Creek	15839	-	-	-	-	1.16	1.74	-	-	2.70	12.0
Twin Creek	32223	-	-	-	-	1.87	0.92	-	-	2.60	11.0
Twin Creek	56799	0.34	-	-	-	1.04	0.34	-	-	3.50	13.0
Twin Creek	114143	-	-	-	-	3.32	0.22	-	-	2.10	12.0
Twin Creek	97759	-	-	-	-	2.0	-	-	-	3.00	13.00
	Mean	**0.4**	**2.7**	**0.0**	**0.5**	**0.4**	**0.2**	**1.7**	**0.0**	**1.9**	**13.5**
	Standard Deviation	**0.8**	**3.7**	**0.1**	**1.0**	**0.8**	**0.6**	**8.2**	**0.0**	**0.7**	**2.2**
	Proportion Occupied	**0.3**	**0.7**	**0.1**	**0.3**	**0.4**	**0.3**	**0.2**	**0.0**		

Appendix D7. Densities (fish/100 m^2) of salmonids observed in 2021 at 23 intensive panel transects snorkeled throughout the Marsh Creek basin, Idaho. Trout fry = all trout <50 mm that could not be distinguished between steelhead and Westslope Cutthroat Trout. Dashes represent transects in which no fish of a given type were observed.

		Density (Fish/100 m^2)								
Stream	**Transect**	**Trout fry**	**Steelhead**	**Chinook salmon**	**WS cutthroat trout**	**Bull trout**	**Brook trout**	**Whitefish**	**Visibility (m)**	**Temp (C)**
Bear Creek	109911	-	-	-	-	-	8.07	-	1.40	16.0
Beaver Creek	11607	0.17	-	10.44	-	-	0.93	0.08	4.80	22.0
Beaver Creek	15703	-	-	-	-	-	-	-	2.00	18.0
Beaver Creek	27991	0.36	-	5.05	-	-	0.27	0.09	5.50	18.0
Beaver Creek	32111	-	-	-	-	-	-	-	1.50	11.0
Beaver Creek	51031a	-	0.64	0.87	-	-	4.21	-	9.70	16.0
Beaver Creek	83799b	-	-	-	-	-	3.18	-	8.10	16.0
Beaver Creek	97111	-	-	-	-	-	-	-	4.00	11.0
Bench Creek	101719	-	-	-	-	-	-	-	0.25	9.0
Cape Horn Creek	150871	0.12	0.86	19.35	-	0.12	1.00	0.49	3.60	17.0
Knapp Creek	40279	-	0.17	0.88	0.17	-	3.35	-	2.40	15.0
Knapp Creek	73047	1.57	1.02	0.86	-	-	1.21	-	4.00	15.0
Knapp Creek	126295	-	0.35	1.58	0.52	-	1.57	-	4.00	17.0
Knapp Creek	130391	-	0.57	-	-	-	0.76	-	2.90	14.0
Knapp Creek	164695	-	-	0.22	-	1.36	-	0.45	4.60	13.0
Lola Creek	60274	-	0.60	1.82	0.30	0.30	0.60	-	2.80	16.0
Marsh Creek	56663	-	-	0.13	-	-	-	-	5.80	10.0
Marsh Creek	89431c	0.42	-	6.09	-	-	-	0.41	3.70	15.5
Marsh Creek	105815d	-	-	-	-	-	-	3.67	7.90	9.0
Marsh Creek	125783	-	0.30	15.03	0.30	-	-	2.61	1.00	12.5
Swamp Creek	21847e	-	-	2.84	-	-	2.50	-	1.50	16.0
Swamp Creek	120151	-	-	-	-	-	-	-	0.50	14.0
Winnemucca Creek	18263	9.35	0.81	0.20	0.20	0.20	6.20	-	4.50	15.0
	Mean	**0.5**	**0.2**	**2.8**	**0.1**	**0.1**	**1.5**	**0.3**	**3.8**	**14.6**
	Standard Deviation	**2.0**	**0.3**	**5.2**	**0.1**	**0.3**	**2.2**	**0.9**	**2.5**	**3.1**
	Proportion Occupied	**0.3**	**0.4**	**0.6**	**0.2**	**0.2**	**0.6**	**0.3**		

APPENDIX E: SALMONID DENSITIES OBSERVED BY SNORKELING IN IDFG EXTENSIVE PANEL TRANSECTS, 2021

Appendix E1. Densities (fish/100 m^2) of salmonids observed in 2021 at 29 extensive panel transects snorkeled throughout the Pete King Creek basin, Idaho. Trout fry = all trout <50 mm that could not be distinguished between steelhead and Westslope Cutthroat Trout. Dashes represent transects in which no fish of a given type were observed.

		Density (Fish/100 m^2)								
Stream	**Transect**	**Trout fry**	**Steelhead**	**Chinook salmon**	**WS cutthroat trout**	**Bull trout**	**Brook trout**	**Whitefish**	**Visibility (m)**	**Temp (C)**
Nut Creek	182210	-	-	-	-	-	-	-	0.8	9.6
Nut Creek	186306	-	-	-	10.72	-	-	-	1.2	14.0
Nut Creek	247746	-	-	-	-	-	-	-	1.7	11.0
Pete King Creek	92098	1.17	1.47	-	4.40	-	-	-	1.1	15.0
Pete King Creek	94754	-	0.68	-	4.07	-	-	-	1.0	13.0
Pete King Creek	127522	1.65	-	-	9.92	-	-	-	NA	9.5
Pete King Creek	153538	1.06	0.35	-	6.00	-	-	-	1.1	17.0
Pete King Creek	209442	-	-	-	15.30	-	-	-	1.5	11.7
Pete King Creek	223170	-	1.32	-	7.91	-	-	-	1.1	11.0
Pete King Creek	239554	-	0.97	-	11.70	-	-	-	1.8	11.0
Pete King Creek	258594	2.52	1.26	-	5.03	-	-	-	1.1	11.0
Pete King Creek	284610	0.29	0.88	-	7.66	-	-	-	0.9	15.3
Pete King Creek	291362	-	-	-	14.07	-	-	-	1.0	13.0
Pete King Creek	382914	4.01	0.74	-	1.49	-	-	-	1.5	18.0
Pete King Creek	389666	-	-	-	6.34	-	-	-	1.4	13.0
Pete King Creek	415682	0.56	0.11	-	2.90	-	-	-	1.4	17.8
Pete King Creek	455202	0.94	-	-	12.25	-	-	-	1.5	12.5
Pete King Creek	501698	0.61	4.58	-	14.66	-	-	-	1.1	16.0
Pete King Creek	504358	-	1.36	-	14.24	-	-	-	1.1	13.4
Placer Creek	59330	-	-	-	2.71	-	-	-	NA	13.0
Placer Creek	182306	-	-	-	-	-	-	-	NA	14.0
Placer Creek	313282	-	-	-	-	-	-	-	NA	10.0
Placer Creek	419778	-	0.65	-	15.68	-	-	-	NA	15.3
Polar Creek	193058	-	-	-	5.22	-	-	-	1.1	9.7
Polar Creek	225826	3.95	-	-	11.86	-	-	-	1.5	11.0
Walde Creek	61986	-	-	-	19.06	-	-	-	1.6	11.5
Walde Creek	84002	-	-	-	-	-	-	-	NA	12.0
Walde Creek	231458	-	-	-	-	-	-	-	NA	13.0
Walde Creek	354242	-	1.58	-	5.05	-	-	-	1.4	12.4
	Mean	**0.6**	**0.6**	**0.0**	**7.2**	**0.0**	**0.0**	**0.0**	**1.3**	**12.9**
	Standard Deviation	**1.1**	**1.0**	**0.0**	**5.8**	**0.0**	**0.0**	**0.0**	**0.3**	**2.4**
	Proportion Occupied	**0.3**	**0.5**	**0.0**	**0.8**	**0.0**	**0.0**	**0.0**		

Appendix E2. Densities (fish/100 m^2) of salmonids observed in 2021 at 24 extensive panel transects snorkeled throughout the O'Hara Creek basin, Idaho. Trout fry = all trout <50 mm that could not be distinguished between steelhead and Westslope Cutthroat Trout. Dashes represent transects in which no fish of a given type were observed.

		Density (Fish/100 m^2)								
Stream	**Transect**	**Trout fry**	**Steelhead**	**Chinook salmon**	**WS cutthroat trout**	**Bull trout**	**Brook trout**	**Whitefish**	**Visibility (m)**	**Temp (C)**
East Fork O'Hara Creek	107298	-	-	-	1.98	-	-	-	2.0	13.5
East Fork O'Hara Creek	217890	-	-	-	-	-	-	-	1.5	12.0
East Fork O'Hara Creek	221986	-	0.32	-	2.56	0.32	4.48	-	1.0	NA
Hamby Fork	135970	0.19	3.88	-	2.91	-	0.19	-	1.5	15.5
Hamby Fork	177442	-	-	-	1.41	0.41	-	-	1.6	14.7
Hamby Fork	251170	-	-	-	3.92	1.68	39.80	-	2.0	14.0
Hamby Fork	275746	-	-	0.77	-	0.50	7.19	-	1.7	15.5
O'Hara Creek	54050	-	0.12	-	3.62	-	-	-	1.8	14.5
O'Hara Creek	87842	11.13	2.97	4.75	0.12	-	-	-	1.7	19.5
O'Hara Creek	104226	12.36	2.64	4.52	0.22	-	-	-	1.9	20.2
O'Hara Creek	123682	12.09	5.13	0.75	0.74	-	0.20	-	1.5	11.0
O'Hara Creek	152354	-	8.00	-	-	-	-	-	1.0	15.0
O'Hara Creek	218914	8.17	2.11	1.46	0.29	-	-	-	1.4	16.4
O'Hara Creek	235298	3.70	3.39	0.71	0.14	-	-	-	1.7	18.5
O'Hara Creek	267042	2.36	5.95	1.73	0.15	-	-	-	1.6	14.0
O'Hara Creek	283426	1.08	3.60	-	-	-	-	-	1.0	15.0
Saddle Creek	189218	-	4.07	-	-	-	-	-	1.0	15.0
Saddle Creek	250658	-	-	-	-	-	-	-	1.0	12.2
Wart Creek	86818	-	-	-	-	-	-	-	1.0	14.9
West Fork O'Hara Creek	44322	-	-	-	-	-	7.21	-	1.8	11.0
West Fork O'Hara Creek	78626	-	-	-	-	0.21	7.87	-	2.6	11.4
West Fork O'Hara Creek	144162	-	-	-	-	-	4.77	-	2.3	12.4
West Fork O'Hara Creek	275234	-	-	-	-	-	6.21	-	1.8	12.1
West Fork O'Hara Creek	306466	-	-	-	-	-	17.4	-	NA	NA
	Mean	**2.1**	**1.8**	**0.6**	**0.8**	**0.1**	**3.4**	**0.0**	**1.5**	**13.8**
	Standard Deviation	**4.2**	**2.4**	**1.3**	**1.3**	**0.4**	**8.7**	**0.0**	**0.5**	**3.9**
	Proportion Occupied	**0.3**	**0.5**	**0.3**	**0.5**	**0.2**	**0.4**	**0.0**		

Appendix E3. Densities (fish/100 m^2) of salmonids observed in 2021 at 15 extensive panel transects snorkeled throughout Peasley Creek, Idaho. Trout fry = all trout <50 mm that could not be distinguished between steelhead and Westslope Cutthroat Trout. Dashes represent transects in which no fish of a given type were observed.

		Density (Fish/100 m^2)								
Stream	**Transect**	**Trout fry**	**Steelhead**	**Chinook salmon**	**WS cutthroat trout**	**Bull trout**	**Brook trout**	**Whitefish**	**Visibility (m)**	**Temp (C)**
Peasley Creek	116898	-	2.47	-	0.38	-	-	-	1.7	8.6
Peasley Creek	125090	-	2.73	-	0.21	-	-	-	NA	7.9
Peasley Creek	133282	-	-	-	0.35	-	-	-	1.4	7.8
Peasley Creek	166050	-	1.33	-	-	-	-	-	1.9	9.2
Peasley Creek	190626	-	2.00	-	-	-	-	-	1.1	9.1
Peasley Creek	247970	-	8.46	-	0.21	-	-	-	1.2	12.4
Peasley Creek	321698	-	4.20	-	0.20	-	-	-	1.7	11.8
Peasley Creek	329890	-	-	-	-	-	-	-	1.6	7.8
Peasley Creek	395426	-	-	-	1.55	-	-	-	2.1	10.4
Peasley Creek	420002	0.94	5.07	-	0.36	-	-	-	1.6	11.0
Peasley Creek	428194	-	2.27	-	0.28	-	-	-	1.2	8.1
Peasley Creek	444578	-	9.46	-	-	-	-	-	1.7	10.1
Peasley Creek	460962	-	3.71	-	0.56	-	-	-	1.6	9.6
Peasley Creek	510114	0.43	4.14	-	0.21	-	-	-	1.8	8.1
WF Peasley Cr	198818	-	-	-	-	-	-	-	NA	10.6
	Mean	**0.1**	**3.1**	**0.0**	**0.3**	**0.0**	**0.0**	**0.0**	**1.6**	**9.5**
	Standard Deviation	**0.3**	**2.9**	**0.0**	**0.4**	**0.0**	**0.0**	**0.0**	**0.3**	**1.5**
	Proportion Occupied	**0.3**	**0.7**	**0.0**	**0.7**	**0.0**	**0.0**	**0.0**		

Appendix E4. Densities (fish/100 m^2) of salmonids observed in 2021 at 22 extensive panel transects snorkeled throughout Panther Creek, Idaho. Trout fry = all trout <50 mm that could not be distinguished between steelhead and Westslope Cutthroat Trout. Dashes represent transects in which no fish of a given type were observed.

		Density (Fish/100 m^2)								
Stream	**Transect**	**Trout fry**	**Steelhead**	**Chinook salmon**	**WS cutthroat trout**	**Bull trout**	**Brook trout**	**Whitefish**	**Visibility (m)**	**Temp (C)**
Clear Creek	43743	0.17	4.83	-	-	-	-	1.19	1.0	16.0
Clear Creek	76511	0.28	3.81	-	-	-	14.00	0.42	1.0	13.0
Clear Creek	125663	0.12	1.46	1.12	-	-	0.12	0.24	1.5	18.0
Clear Creek	142047	5.85	-	-	-	-	-	-	1.0	14.0
Panther Creek	16815	-	-	-	-	-	0.30	-	0.8	13.0
Panther Creek	29407	-	0.42	0.21	-	0.14	-	3.09	2.2	18.0
Panther Creek	31903	-	2.76	-	0.14	-	-	1.35	1.5	19.0
Panther Creek	47263	-	1.02	4.48	0.71	-	-	0.30	1.6	22.0
Panther Creek	51935	-	0.12	0.57	0.04	-	-	1.50	1.5	22.0
Panther Creek	57007	-	-	-	-	-	-	-	2.3	13.0
Panther Creek	60127	-	0.25	0.10	0.15	-	-	4.10	2.3	20.0
Panther Creek	68319	-	2.70	2.17	0.63	-	-	3.27	1.5	18.0
Panther Creek	84127	-	4.70	-	0.46	-	-	-	1.0	17.0
Panther Creek	101087	-	4.07	0.11	1.32	-	-	2.53	2.0	18.0
Panther Creek	133855	-	2.43	0.56	0.10	-	-	1.46	1.5	19.0
Panther Creek	146591	-	2.54	5.91	0.27	-	-	1.81	1.9	22.0
Panther Creek	153759	-	1.77	6.12	0.18	-	0.09	0.09	1.4	23.0
Panther Creek	154783	-	4.14	0.35	0.70	-	-	0.98	1.8	22.0
Panther Creek	157855	-	-	-	0.88	-	1.76	-	1.0	14.0
Panther Creek	158431	-	0.04	-	0.04	-	-	3.51	2.6	21.0
Panther Creek	179359	0.05	0.30	-	-	-	-	-	1.6	13.0
Panther Creek	182431	-	-	-	0.88	-	-	-	1.0	17.0
	Mean	**0.3**	**1.7**	**1.0**	**0.3**	**0.0**	**0.7**	**1.2**	**1.5**	**17.8**
	Standard Deviation	**1.2**	**1.7**	**1.9**	**0.4**	**0.0**	**3.0**	**1.3**	**0.5**	**3.4**
	Proportion Occupied	**0.2**	**0.8**	**0.5**	**0.6**	**0.0**	**0.2**	**0.7**		

Appendix E5. Densities (fish/100 m^2) of salmonids observed in 2021 at 22 extensive panel transects snorkeled throughout Basin Creek, Idaho. Trout fry = all trout <50 mm that could not be distinguished between steelhead and Westslope Cutthroat Trout. Dashes represent transects in which no fish of a given type were observed.

		Density (Fish/100 m^2)								
Stream	**Transect**	**Trout fry**	**Steelhead**	**Chinook salmon**	**WS cutthroat trout**	**Bull trout**	**Brook trout**	**Whitefish**	**Visibility (m)**	**Temp (C)**
Basin Creek	101975	-	0.15	-	1.21	0.15	-	-	2.2	11.0
Basin Creek	151127	-	0.14	-	0.43	-	-	-	1.8	12.0
Basin Creek	153175	-	1.45	2.91	0.96	-	-	0.12	2.0	20.0
Basin Creek	169559	1.21	4.47	2.08	2.23	-	0.17	1.21	3.5	19.0
Basin Creek	183895	-	1.27	0.43	4.85	-	-	-	3.0	11.0
Basin Creek	208471	0.19	1.16	-	-	-	-	-	3.1	18.0
Basin Creek	222807	2.05	1.06	0.41	-	-	-	1.76	3.8	18.0
Basin Creek	235095	-	0.85	1.00	1.99	-	-	-	3.4	17.0
Basin Creek	282199	-	0.26	0.26	-	-	0.53	-	1.7	16.0
Basin Creek	284247	0.73	2.89	1.46	1.20	-	-	0.60	3.5	18.0
Basin Creek	300631	0.98	5.70	2.77	2.76	0.32	-	-	3.4	18.0
Basin Creek	314967	-	0.93	-	-	-	-	-	2.5	13.0
Basin Creek	323159	1.54	2.13	-	-	1.81	0.30	-	1.0	14.0
Basin Creek	366167	0.29	1.16	3.37	3.04	0.14	0.72	-	2.6	17.0
Basin Creek	380503	-	1.20	0.40	1.00	-	-	-	2.4	10.0
Basin Creek	446049	-	0.95	-	-	-	-	-	2.0	19.0
East Basin Creek	104023	-	0.88	-	4.16	0.29	-	-	3.6	14.0
East Basin Creek	38487	-	1.20	1.20	3.60	-	-	-	3.1	16.5
East Basin Creek	431703	0.30	4.86	-	1.82	-	-	-	3.9	12.0
East Basin Creek	448087	-	3.78	-	-	-	-	-	1.0	6.0
East Basin Creek	480855	-	9.01	-	-	-	-	-	1.0	9.0
East Basin Creek	54871	-	4.80	-	-	-	-	-	1.0	11.0
	Mean	**0.3**	**2.3**	**0.7**	**1.3**	**0.1**	**0.1**	**0.2**	**2.5**	**14.5**
	Standard Deviation	**0.6**	**2.2**	**1.1**	**1.5**	**0.4**	**0.2**	**0.5**	**1.0**	**3.9**
	Proportion Occupied	**0.4**	**1.0**	**0.5**	**0.6**	**0.2**	**0.2**	**0.2**		

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