2017-2018 Funded Projects

This table summarizes approved 2017-2018 funding allocations for technical committee projects.

**Supporting Committee: Large Lakes**

# of Projects: 16

<table>
<thead>
<tr>
<th>Status</th>
<th>Project Title</th>
<th>Delivery Region</th>
<th>Allocated $</th>
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<tbody>
<tr>
<td>Completed</td>
<td>Cutthroat Trout Life History Investigations in Comox Lake</td>
<td>1- West Coast</td>
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<td>Completed</td>
<td>Kootenay Lake Piscivore Recovery Monitoring</td>
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<td>Central Lakes Exploitation High Reward Tag Program</td>
<td>5 - Cariboo</td>
<td>990</td>
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<td>Chilko Bull Trout Assessment</td>
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<td>Quesnel Lake Exploitation Study – High Reward Tags</td>
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<td>Ongoing</td>
<td>Meziadin Lake Bull Trout Management</td>
<td>6 - Skeena</td>
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<td>Completed</td>
<td>Okanagan River Kokanee Assessment &amp; Genetic Analysis</td>
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<td>Completed</td>
<td>Kokanee Shore Spawner Assessments</td>
<td>8 - Okanagan</td>
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<td>Middle Vernon Creek Access Improvements</td>
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<td>Penticton Creek Restoration Initiative</td>
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<td>Mission Creek Restoration Initiative</td>
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<td>Ongoing</td>
<td>Provincial Ageing Laboratory Support</td>
<td>Provincial</td>
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474,765
Delivery Region Locations

1. Region 1 West Coast
2. Region 2 South Coast
3. Region 3 Thompson
4. Region 4 Kootenay Boundary
5. Region 5 Cariboo
6. Region 6 Skeena
7. Region 7a Omineca
8. Region 7b North East (Peace)
9. Region 8 Okanagan

image credit: frontcounterbc.com
Cutthroat trout from Comox Lake were captured and tagged through the spring, summer, and fall periods of 2016 and 2017 (n=309). A sub-sample of captured individuals were marked using passive integrated transponder (PIT) tags (n=120) and a combination of low-reward and high-reward floy tags (179). Fish sampling information was used to develop life history parameter estimates for cutthroat trout including relationships for growth, maturity, and fecundity. In the spring periods of 2017 and 2018, portable PIT array antennas were established in several of the primary cutthroat trout spawning streams to monitor fish movements and survival.

Fifteen fish were detected in the PIT arrays in 2017 and as of the time of this reporting, four fish have been detected in the PIT arrays in 2018 and 17 fish have been reported captured by anglers. The resultant angler tag-reports together with the mark-resight/recapture data was used to establish estimates of natural mortality and exploitation rate (details in Anderson and Atkinson 2018 draft.). Final survival estimates will be available following completion of PIT tag monitoring in April/May 2018 and incorporation of this information into the analysis.

Together, this information is used to support an age-structured yield-per recruit analysis to evaluate the sustainability of current fishing effort levels, the suitability and effectiveness of current regulations, and the simulation of alternative regulatory approaches (Anderson and Atkinson 2018 draft).

| Tracking No. | L1704 | Year 2 of 2 | Total Spent to Date | $48,799 |
Kootenay Lake has recently had a strong mismatch between predator and prey abundance, which has ultimately collapsed kokanee populations. This project, recommended in the Kootenay Lake Action Plan (Redfish Consulting 2016) provided key data necessary to guide timely implementation of effective actions to speed short term recovery of kokanee stocks in Kootenay Lake. More data was required on piscivore diet, age structure and other biological data in order to better understand changing predator pressure on kokanee. In addition, fish collected through angling efforts for diet analysis also allowed collection of additional data that directly informed recovery efforts, including estimates of angling catch rates, estimates of age structure in the fishery, a genetics study to identify proportion of Gerrards in the fishery, and identification of the age at entry to the lake of Gerrard juveniles through otolith microchemistry to better understand recruitment dynamics and in-lake survival rates.

A total 82 days of angling effort was expended (2,882 rod hours) for a total catch of 821 fish (640 rainbow trout and 181 bull trout). Catch rate data from this study was comparable to mail-out survey results for the same period, suggesting that angling effort as completed in this study could replace mail-out surveys, if conservation surcharge stamps and associated information were not available for mail surveys (i.e. in the event of significant conservation concerns for Gerrard Rainbow Trout).

Genetic techniques employed in this study were able to discern between Gerrard and non-Gerrard rainbow trout in the troll fishery (>98% assignment probability), and therefore could be employed in the future to track changes and relate this back to catch rate estimates and inferred in-lake abundance trends. Through this study, the ratio of Gerrard Rainbow Trout was relatively stable and high (73%), and combined with catch rate and age data, suggests that there are no current conservation concerns for Gerrards. Analysis of morphometric measurements (partitioned by genetic results) showed that Gerrard Rainbow Trout had significantly larger feeding apparatus than non-Gerrard Rainbow Trout, likely driven by relative prey size by ecotype. Although morphometric differences were statistically different between ecotypes, there was significant enough variation and overlap in this data and the differences were small enough that this technique, in the absence of genetic data, would not likely assign individuals at a high rate to the correct ecotype in future studies.

Diet data showed that kokanee comprised the majority of bull trout diet. Genetic results allowed separation of rainbow trout diet by Gerrards and non-Gerrards. In general, rainbow diet was more variable, and showed the expected contrast between ecotypes (Gerrards rely on kokanee and insects; non-Gerrards rely on insects and mysis shrimp/zooplankton). Perhaps the most surprising result was the significance of mysis shrimp in all fish diets (15-45%). The high kokanee consumption rates of bull trout identified in this study were a key piece of data which supported recent angling regulation changes (bull trout daily quota increased to 2/day, only 1>50cm), and will be a key component of ongoing analysis around the need for additional bull trout reductions. In addition, the strong catch rates of rainbow trout, identified by genetics as a high proportion of Gerrards, also allowed angling regulation changes to allow additional harvest (daily quota trout/char increased to 5/day).

Evaluation of age at entry to the lake through otolith microchemistry was in process at the time of reporting, and will be included in the final technical report from this project.

Although kokanee recovery takes time, and relies on a more complex suite of actions not part of this project, this project provided key data to guide Action Plan implementation. Direct recreational benefits in the time frame of this project included changes in angling regulations that allowed additional bull trout and rainbow trout angling opportunities to help balance kokanee and predator abundance (increased daily quota), and is informing ongoing analysis around potential further predator control options; some of which may allow increased recreation harvest opportunities.

<table>
<thead>
<tr>
<th>Tracking No.</th>
<th>L1702</th>
<th>Year</th>
<th>2 of 2</th>
<th>Total Spent to Date</th>
<th>$109,548</th>
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Kootenay Lake Kokanee Recovery Initiative

Status: Ongoing

Kokanee populations in Kootenay Lake have collapsed in the past four years. Kokanee escapement has historically ranged from 250,000 to nearly 2.2 million. In 2017, kokanee spawner escapement was ~18,000 spawners (<1% of historic highs) and predictions for spawner returns over the next 2 years suggest they may also be nearly as low. In response to this collapse, the Ministry formed an advisory team in March 2015 (Kootenay Lake Advisory Team [KLAT]) which includes Provincial stock assessment and Regional biologists, Freshwater Fisheries Society of BC, Fish and Wildlife Compensation Program biologists, First Nations, and BC Wildlife Federation. With the help of a consultant, this team produced an Action Plan (Kootenay Lake Action Plan; Redfish Consulting 2016) that lays out actions and triggers for implementation for both kokanee and predator populations. The objective of this project (year 3 of 5) was to speed recovery of Kootenay Lake kokanee stocks, and also decrease declines in large Gerrard and bull trout abundance through delivery of the triggered action of kokanee supplementation as outlined in the Kootenay Lake Action Plan (stock 5-7 million eyed kokanee eggs).

Kokanee egg collection activities in 2017 occurred at four general sites, including tributaries to Whatshan, Kinbasket, and Arrow Lakes Reservoirs, as well as kokanee brood stock lakes in the Interior (Deka, Bridge and Sulphourus Lake). A total of ~10 million green eggs were collected in Fall of 2017 and incubated at FFSBC hatchery locations in Clearwater and Cranbrook, as well as incubated at the Meadow Creek spawning channel. Once eggs reached the “eyed stage” in development, any dead eggs were individually picked out, and then these eggs were transported to the Meadow Creek spawning channel. A total of ~8.6 million eyed eggs were transported and ultimately planted in the gravel at Meadow Creek.

Part of this project’s intent in 2017 was to index survival of eggs planted in Fall of 2016, through directed sampling in Spring of 2017 of fry leaving egg plant locations. Of the total 6.8 million eggs planted, a total of 3.8 million fry were estimated leaving egg plant locations (56% egg-fry survival). At the time of reporting, eggs planted in Fall of 2017 have hatched and are currently incubating in the gravel as alevin. These fry will ultimately migrate to Kootenay Lake between April and June, 2018. Although the ultimate measure of egg survival will occur when fry are enumerated leaving the channel, a cursory check of incubation success (measure of dead eggs that remain in incubation tubes) was completed on March 7, 2018, and suggested that >70% of planted eggs had survived to hatch.

To increase future supply of kokanee eggs from a genetic source most similar to Kootenay Lake, we initiated requests to stock interior kokanee brood lakes (Deka, Bridge and Sulphourus Lake) with a significant portion of all female kokanee from Kootenay genetic sources. Females for this stocking were taken from Whatshan Reservoir (Kootenay Lake genetic match), but XX males required for this project were to come from kokanee broodstock held at the FFSBC Clearwater hatchery. Because the genetic structure of these individual fish were not clear, we examined individual fish genetics through UBC Okanagan (FFSBC data on file) to evaluate the suitability of these individuals for this purpose. Genetic study was completed, and production of all female kokanee is now close to complete for 2018 stocking and 2020 egg supply (if required).

Biological data collected at brood stations at the time of reporting had yet to be compiled, and age structures collected have also not yet been analyzed.

| Tracking No. | L1604 | Year 3 of 5 | Total Spent to Date | $377,232 |

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This study focused on obtaining information on the recruitment of Gerrard Rainbow Trout under low stock abundance. Stock abundance (spawner numbers) is expected to be at or near record lows over the next 3-5 years, due to the near collapse in the Kokanee population on the lake (MFLNRO 2016). Obtaining estimates of juvenile production from the low abundance of spawners is expected to be highly informative in understanding the population dynamics of this unique trout population. Such information will provide necessary data in developing a stock-recruitment relationship for this ecotype and assist fisheries managers in future using an abundance based management framework, similar to that for Steelhead in BC (MFLNRO 2015).

Obtaining further estimates of juvenile production at contrasting escapements (high and low) is very important in defining a stock-recruitment relationship and understanding the dynamics of this unique stock. When completed, this project is intended to achieve the following:

1) Estimate spring parr densities and estimate spring standing stock from Lardeau and Duncan rivers
2) Define a stock-recruitment relationship for Gerrard Rainbow Trout needed for management
3) Determine river carrying capacity at low stock abundance
4) Develop a hierarchical Bayesian Model to estimate abundance and uncertainty in abundance estimates
5) Obtain estimates on contrasting escapement information (high and low)
6) Assist with the recovery, recovery timeline and future management of the stock

In summary, this study over the next three years aims to improve on current estimates of juvenile production by reducing uncertainty related to total available habitat through improved mapping in GIS on both rivers and minimizing biases associated with observer efficiencies related to mark-recapture methodologies. The expected low spawner numbers in the near future also provides an opportunity to determine recruits at low abundance thus improving the stock recruitment relationship for this ecotype.

**Tracking No.**  L1803  
**Year 1 of 2**  
**Total Spent to Date**  $13,567
Central Lakes Exploitation High Reward Tag Program

Status: Completed

Introduction:
This funding request fulfills a component of a multi-year HCTF/FLNRO funded exploitation/movement study on Horse Lake in the Cariboo Region. Funding is being requested for the payment of high reward tags returned by anglers. Reliable reporting of angler-captured tagged fish is a critical component of the study. High reward tags are used as an incentive to ensure anglers report the capture of tagged fish. While the majority of funding is provided by HCTF and FLNRO, the FFSBC has been successfully funding rewards for reported recaptures for two other similar projects in the region (i.e., $110). Information collected through this study is being used directly to inform development of sustainable angling regulations and habitat protection measures.

Project Objectives:
• Specific to this funding request: administer rewards for high reward tagged trout
• Estimate exploitation and mortality rates LT in Horse Lake
• Inform management decisions – catch quotas, area closures, etc.
• Increased level of angler participation and satisfaction

Methods:
Issue payment to anglers who captured tagged lake trout from Horse Lake.

Results:
Anglers reported capturing five tagged lake trout in Horse Lake. FFSBC issued.

Recreational benefits achieved as an outcome of this project:
Sustained recreational benefits for fisheries, supported by wild stocks, are dependent upon healthy fish populations. This project provides information that is fundamental for sustainable management of the fisheries in the central lakes area. Specifically, this project provides data required for development of science based angling regulations.

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The large rainbow trout, bull trout and lake trout of Quesnel Lake support an economically important sport fishery but little is known about the proportion of the populations annually captured by anglers. In response to declining size of rainbow trout, very restrictive regulations were implemented for the Quesnel Lake fishery in 2002. Research conducted since that time suggests the decline in size of rainbow trout was largely due to a reduction in kokanee numbers, which is the primary prey species for Quesnel Lake trout. However, the kokanee population has increased substantially over the last decade and anecdotal reports from the angling public indicate trout densities have also increased in recent years. Given increasing trout populations, there may be an opportunity to increase angling opportunity in Quesnel Lake.

This specific project was initiated in 2015 to support the ongoing Quesnel Lake exploitation study, through the administration of high rewards (i.e., $100) to anglers who captured marked rainbow trout, lake trout, or bull trout in Quesnel Lake. The objective of this component of the study is to evaluate current exploitation rates for each species, which will be used to inform development of sustainable angling regulations. The use of high reward tags provides an incentive for anglers to report recaptured fish as well as improve public interest and participation in the study. A total of 25 trout were recaptured during the 2017 angling season. Exploitation rates for each species will be evaluated over a total period of 8 years, which accounts for two full sockeye cycles, to improve our understanding of exploitation rates and associated variability.

Year 3 of this project was successful in achieving stated project objectives.

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Chilko Bull Trout Assessment

Chilko Lake bull trout support both recreational and First Nations subsistence fisheries. In addition to being captured in the lake, substantial numbers of bull trout are caught in the Chilko River where they congregate to exploit sockeye smolt out migrants. Bull trout throughout the Chilko watershed are potentially vulnerable during this time as the Chilko system supports one of the largest sockeye salmon populations in the Fraser watershed (~1 million spawning escapement and 10-40 million juvenile smolt outmigrants annually). While bull trout are known to be targeted in the Chilko and Chilcotin rivers during the smolt outmigration as well as within the lake, during summer and fall, very little is known with regards to current exploitation rates, size structure and spatial distribution. Understanding exploitation dynamics (i.e., both what rate and where) is central to development of sustainable angling regulations. Information from this study will be used directly to inform future management of both the Chilko Lake and Chilko River bull trout fisheries.

In 2017, twenty-two acoustic receivers were successfully deployed throughout the watershed to track movement and survival of tagged bull trout. A total of 20 bull trout were tagged with acoustic transmitters and an additional 65 bull trout were marked with high reward tags only. Adipose fin samples were taken from 68 bull trout, and fin rays were collected from 34 bull trout.

The FFSBC funding is being utilized specifically to administer payment of high rewards (i.e., $75) to anglers who capture marked bull trout within the Chilko watershed. Eight marked bull trout were reportedly recaptured in 2017. The number of recaptures was likely reduced due to unprecedented wildfire season, in the area, which cut off access to the lake for a substantial portion of the angling season.

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Meziadin Lake Bull Trout Management

Status: Ongoing

Meziadin Lake is the most important Sockeye production lake in the Nass watershed, and the most significant large lake fishery for Bull Trout in Skeena Region. Bull Trout are retained in the lake’s highly popular recreational troll fishery which targets Sockeye during the summer, and are also sought for harvest in directed recreational fisheries in the lake during the other seasons of the year. The last decade has seen significant growth in participation in the Meziadin Lake fishery. However, the life history, stock structure and productivity of the Bull Trout captured are poorly understood at present, as is the magnitude of the harvest. This information is needed to regulate the recreational fisheries in Meziadin Lake to maintain the quality and attractiveness of the fishery while creating low conservation risk for the Bull Trout population(s). This includes the angling and harvest opportunities in the lake and potentially in adjacent streams.

To achieve the goal of sustainable management of Bull Trout fisheries in Meziadin Lake, this five year project has the following three primary objectives:

1. Describe the stock structure, production areas and seasonal movements of the lake’s Bull Trout;
2. Characterize the recreational fisheries which exploit the species in the lake, including exploitation rate; and
3. Develop a management approach, including angling regulations and monitoring, which conserves the characteristics of the fish and fishery (abundance and catch rate, fish size, opportunity to harvest) that are attractive to anglers.

To achieve the project’s objectives, at least 100 Meziadin Lake Bull Trout will be captured by angling and netting and receive surgically-implanted acoustic tags, along with external anchor tags bearing a high reward ($100) to encourage angler reporting of their capture. An additional 50 to 100 Bull Trout will receive high reward tags with no acoustic transmitter. An array of acoustic receivers will be maintained in the offshore waters of the lake, along with receivers in the lake’s outlet river and main inlet streams. Together with the returned tags from the recreational fishery, this will allow estimation of the catch rates and harvest rates in the fishery as well as the natural mortality rate. A creel survey will be conducted in year 3 of the study to collect life history data from the harvested catch and estimate the activity, catch and harvest in the fishery. In combination, these data will allow the design of angling regulations that achieve the goal of fishery sustainability.

In year one of the study, 42 Bull Trout were acoustically tagged, and an additional 32 Bull Trout were released with high-reward anchor tags only. An array of 8 acoustic receivers was installed in the lake, along with two receivers in the lake’s outlet river and one each in the lake’s three major inlet streams. To date, seven of the bull trout have been reported captured by the angling public; six of these were acoustically tagged with tags returned so that re-use is possible.

Tracking No. L1804 Year 1 of 5 Total Spent to Date $10,030

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Okanagan River Kokanee Assessment & Genetic Analysis

Status: Completed

Based on recommendations from the Canadian Okanagan Basin Technical Working Group (COBTWG), there is an urgent need to enumerate kokanee spawners in the Okanagan River (from both the Skaha and Osoyoos Lake populations). Visual surveys are annually conducted and provide an estimate of ‘nerkid’ abundance (combination of kokanee and sockeye spawners). In order to determine the impacts of sockeye on kokanee, monitor changes in the kokanee population and determine appropriate management actions, it is critical to annually estimate the size and abundance of kokanee spawners.

This project uses novel genetic methods to assign collected bio-samples to kokanee, sockeye or hybrid based on cluster membership at specific DNA markers called single nucleotide polymorphisms (SNPs). This project has greatly increased our understanding of interactions between kokanee and sockeye and has large scale implications for future sockeye stocking programs in BC. Additionally, this information has allowed for the justification of the continued recreational fishery opening in Skaha Lake. Without this information, DFO and First Nations requested that the recreational fishery be closed in the summer months to protect migrating sockeye. This information demonstrates that the traditional 30 cm length limit to distinguish sockeye and kokanee in the federal regulations is not applicable to Skaha Lake.

Tracking No. L1606 Year 3 of 3 Total Spent to Date $24,181

Middle Vernon Creek Access Improvements

Status: Completed

The kokanee population in Wood Lake has experienced dramatic fluctuations as a result of poor in-lake survival and a lack of access to spawning habitat in Middle Vernon Creek (due water shortages). When kokanee returns are high, Wood Lake is an important wild stock kokanee fishery in the Okanagan, and supports over 10,000 angler days per year.

Floods in the spring of 2017 caused significant damage to the Middle Vernon Creek (the primary spawning habitat for Wood Lake kokanee). Current flows (as of August 18, 2017) are at critical levels for kokanee spawning and in-stream works were completed to supply water to spawning habitat and allow fish access to spawning habitat. Flows into Middle Vernon Creek are controlled through releases from upland storage.

This project was focused on removing sediment build up and a debris blockage in the middle section of Middle Vernon Creek (approximately 100 m in length). This material was moved and re-located to ensure water flows optimally through this section (and does not flood out neighbouring properties).

Tracking No. L1809 Year 1 of 1 Total Spent to Date $16,708
Kokanee Shore Spawner Assessments

Status: Completed

See L1801 - Combined with L1810

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Penticton Creek Restoration Initiative

Status: Ongoing

Project Objectives:
1) Restore stream habitat
2) Increase Rainbow Trout and Kokanee production from Penticton Creek
3) Capture and rear Kokanee for release into Penticton and Ellis Creeks.

Results:
1) 2017-18 was scheduled as a restoration year, but due to unforeseen issues with property owners adjacent to the proposed site and inability of City staff to dedicate time to confidential negotiations due to severe spring flooding issues, the project was not able to proceed. The restoration committee attempted to make a rapid change in restoration site (to avoid property owner issues), however, after engineer analysis of feasibility the alternate project (within budget constraints) was deemed to be too high a flood risk to proceed. At this time all of the required agreements with property owners have been signed and the original project is just awaiting government approval to go to tender for completion in the summer of 2018 (delay of one year). However, some minor restoration was completed, by adding spawning gravel to previously restored sections, and this gravel was used for spawning in fall of 2017.

2) Increased fish production is being measured through before and after electrofishing of the restoration section as well as annual Kokanee enumeration. In 2016, dozens of salmonids were captured in the 83 m restoration section from 2015 (previously devoid of fish). Kokanee monitoring shows that the distribution of Kokanee throughout the stream length remains similar to pre-restoration, but we will not see population level results until 2019 for habitat, and fall 2018 for stocking.

3) In 2017 a Kokanee fence trap was installed on Penticton Creek and just under 4000 Kokanee returned to spawn. An estimated 140,000 eggs were collected from 331 females. This was the largest take to date, and will be the last take, likely for several years depending on MFLNRO direction.

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<tr>
<td>L1609</td>
<td>3 of 5</td>
<td>$60,460</td>
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The kokanee population in Wood Lake has experienced dramatic fluctuations as a result of poor in-lake survival and a lack of access to spawning habitat in Middle Vernon Creek (due water shortages). When kokanee returns are high, Wood Lake is an important wild stock kokanee fishery in the Okanagan, and supports over 10,000 angler days per year.

In Year 1, this project provided key spawner enumeration data required to support changes to angling regulations. Operating the fish fence at Middle Vernon Creek verified the relationship between the standard visual survey count and the census count at the fence. The data collected from this project suggest that there are approximately 2.5 times more fish present than are observed in the visual survey. This information was used in conjunction with the estimate of shore spawners and angler effort and harvest data to support a change in regulations from the current 2 fish per day limit to 5 fish per day. The Okanagan Fisheries Section is planning to implement this change in the next version of the synopsis and the effectiveness of this regulation change will be monitored in years 3-5 of the project.

**Middle Vernon Creek Kokanee Enumeration**

**Status:** Ongoing

The kokanee population in Wood Lake has experienced dramatic fluctuations as a result of poor in-lake survival and a lack of access to spawning habitat in Middle Vernon Creek (due water shortages). When kokanee returns are high, Wood Lake is an important wild stock kokanee fishery in the Okanagan, and supports over 10,000 angler days per year.

In Year 1, this project provided key spawner enumeration data required to support changes to angling regulations. Operating the fish fence at Middle Vernon Creek verified the relationship between the standard visual survey count and the census count at the fence. The data collected from this project suggest that there are approximately 2.5 times more fish present than are observed in the visual survey. This information was used in conjunction with the estimate of shore spawners and angler effort and harvest data to support a change in regulations from the current 2 fish per day limit to 5 fish per day. The Okanagan Fisheries Section is planning to implement this change in the next version of the synopsis and the effectiveness of this regulation change will be monitored in years 3-5 of the project.

**Tracking No.** L1801  
**Year** 1 of 5  
**Total Spent to Date** $9,704
### Mission Creek Restoration Initiative

**Status:** Ongoing

The Mission Creek Restoration Initiative (MCRI) was formed in 2002 to address declining kokanee stock and habitat degradation concerns in Mission Creek. Mission Creek is considered Okanagan Lake’s most important kokanee producing stream; recovery of the kokanee stream spawning population, via the Okanagan Lake Action Plan (OLAP) has been considered a top priority for the Region 8 Fisheries Program for more than a decade.

Sections of Mission Creek were channelized and diked in the 1950s resulting in the loss of more than 60% of the creek’s length, 80% of the spawning and rearing habitat and 75% of its wetland and riparian areas. Current spawner escapement estimates indicate Mission Creek kokanee stocks are continuing to decline and are less than half of what they were a decade ago (FLNRO, 1971-2015). Furthermore, antidotal evidence suggests a more recent decline in the Okanagan Lake rainbow trout stocks; who’s adults spawn & juvenile rear in Mission Creek and support a quality fishery (>20lbs).

A large scale restoration project, intended to help recover Okanagan Lake kokanee stocks and improve the quality and economic value of the recreational fishery, was completed in 2016. Work consisted of setback of 540 m of dike, establishment of 24,000 m² riparian & 18,000 m² of floodplain habitat, reconnection of a historic side-channel to provide access to 600m² of off-channel/rearing habitat for juvenile salmonids, creation of four deep-water holding pools/thermal refugia (750 m²) along the Mission Creek mainstem for adult rainbow and kokanee during late summer months; and placement of 300m² of LWD cover (56 tree/root plates).

Monitoring and assessment of fish stocks, habitat and restoration works are critical in order to evaluate whether habitat restoration projects are an effective tool to recover regional fish stocks and ultimately improve the quality of the recreational fishery. This FFSBC project involved monitoring of fish distribution, use & habitat; the structural integrity and functionality of restoration works; and implementing any required structural repairs/adjustments, as required, to ensure the restoration works are achieving the specified objectives.

MCRI activities in 2017/18 not funded by FFSBC included exploration of future restoration opportunities through a Committee-based prioritization of individual properties within lower Mission Creek according to current biological values, potential restoration benefits and securement opportunity. The MCRI Committee is hoping this will lead to securement of one or more properties in the near future in order to proceed with a similar restoration project as delivered in 2016.

Project funding was secured from the Freshwater Fisheries Society (FFSBC), Habitat Conservation Trust Fund (HCTF), the Mission Creek Compensation Bank (MCCB), Okanagan Basin Water Board (OBWB), Recreational Fisheries Conservation Partnership Program (RFCPP) totaling $86,000 to complete monitoring, design, construction, and coordination and project administration in 2017/18.

| Tracking No.  | L1802 | Year of 1 | Total Spent to Date | $34,711 |
**Moberly Lake Lake Trout Recovery Monitoring**

**Status:** Completed

The population of Lake Trout in Moberly Lake is critically low (~500) with a nearly complete failure in juvenile recruitment. The potentially imminent risk of extirpation and the significance of this Lake Trout population from a historical, cultural, and recreational perspective have led us to initiate a series of rehabilitative stocking efforts, in an effort to re-establish a balanced fish community and natural recruitment. All three cohorts of hatchery-raised juvenile Lake Trout have now been released during the springs of 2012, 2014 and 2016. This project will now focus primarily on monitoring to measure the success of the stocking efforts on the rehabilitation of this population.

**Project Objective(s):**

* Maintain quantitative annual estimates of abundance, survival, recruitment, and population growth rate for the mature Lake Trout population;
* Maintain a large number of marked individuals in the Moberly Lake Trout population (>50%) through the annual capture of 30-50 male lake trout;
* Collect information on hatchery and wild juvenile Lake Trout to support understanding of their growth and survival during the interim period when fish are not fully vulnerable to standardized sampling techniques (<3-4 years old).

The 2017 results do not show a recovery of the Moberly Lake Trout at this time: no hatchery fish have been caught on the spawning shoals yet and there has been no significant increase in relative population size in the last 4 years. We feel that our sample sizes and efforts this year would have been sufficient to detect both a relative population change in the SLIN (spring littoral index netting) sampling and any new hatchery fish entering the spawner population in significant numbers. We recommend that sampling on the spawning shoals continues for a few more years to allow all hatchery cohorts to reach spawning age, and anticipate what management options may still need to be taken with this program. In the meantime, recreational fishing for Lake Trout will remain closed.

**Tracking No.** L1703  **Year** 2 of 2  **Total Spent to Date** $37,169

**Provincial Ageing Laboratory Support**

**Status:** Ongoing

Fisheries management projects delivered by provincial biologists often require the collection of samples for the determination of age structure of a population. Age structure information is vital in the management of recreationally important stocks. In 2015 due to retirements, one of the main sources of fish ageing services in the province was no longer available to many provincial biologists. At that time, the Province and FFSBC investigated several options and eventually recommended the establishment of an in-house provincial aging laboratory. This proposal represents phase 2 of 3 phases in our development plan for the provincial aging laboratory. The first phase funded by the SLC and LLC in 2015, accomplished two goals: we acquired some laboratory equipment necessary for two groups to process aging structures concurrently and we furthered our development of technical expertise for scale processing and ageing through a training session with DFO and collaboration with retired ageing experts. In 2016, we were fortunate to secure MOE base funds for small equipment purchases for the lab and an additional scope was secured with Alouette Nutrient Restoration Project funds.

The priorities for phase 2 are to secure funds for lab coordination and management, further development of the laboratory's technical expertise in otolith processing and aging, to finalize required equipment upgrades, reduce the backlog of structures to be aged, and reduce turnover time for age analysis.

**Tracking No.** S1618  **Year** 2 of 3  **Total Spent to Date** $97,999