2017-2018 Funded Projects

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

Supporting Committee: Small Lakes

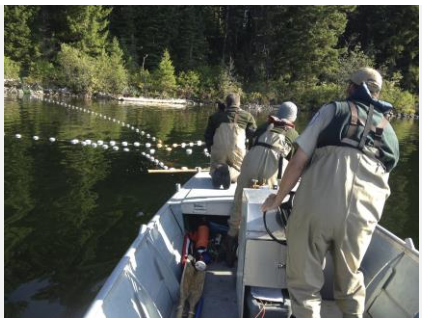
of Projects: 28

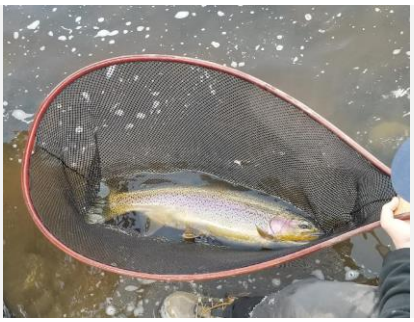
Status	Project Title	Delivery Region	Allocated $
Completed	West Coast Region Lakes Angling Questionnaire	1- West Coast	29,850
Completed	Vancouver Island Small Lake Assessments	1- West Coast	17,000
Completed	Small Lake Nutrient Enrichment Program	1- West Coast	17,600
Ongoing	Assessment of Kawkawa Lake kokanee: fishery, stock and spawning	2 - South Coast	30,500
Completed	Small Lakes Angler Access Project	3 - Thompson	12,000
Completed	Kamloops Small Lakes Assessment	3 - Thompson	16,000
Completed	Plan for Small Lakes Recreational Fisheries in the Kootenay Region of British Columbia	4 - Kootenay	10,000
Completed	East Kootenay High Effort Creel Surveys	4 - Kootenay	24,500
Completed	Kootenay Small Lake Assessments	4 - Kootenay	20,000
Ongoing	Kootenay flightline	4 - Kootenay	25,700
Completed	Dragon Lake Risk Assessment	5 - Cariboo	7,000
Completed	Cariboo Small Lake Assessments	5 - Cariboo	17,520
Ongoing	Williams Lake/Quesnel - Flight Line	5 - Cariboo	30,000
Completed	Omineca Small Lake Assessments	7a - Omineca	22,662
Completed	Omineca Camera Effort Assessment	7a - Omineca	9,647
Ongoing	Omineca Kokanee Creel Survey	7a - Omineca	5,794
Ongoing	Omineca Flightline – Prince George	7a - Omineca	35,000
Completed	Small Lakes Access and Signage Review	8 - Okanagan	16,500
Completed	Okanagan Small Lakes Stock Assessment	8 - Okanagan	7,500
Ongoing	Okanagan Flight Lines	8 - Okanagan	19,500
Completed	Peace Small Lakes Assessment	7b - Peace	8,200
Completed	Peace Camera Counts	7b - Peace	16,046
Completed	Horsefly Rainbow Trout Strain Development Support	Provincial	10,316
Completed	Monitoring Stock Lakes Water Chemistry	Provincial	3,300

Supporting Committee: Small Lakes

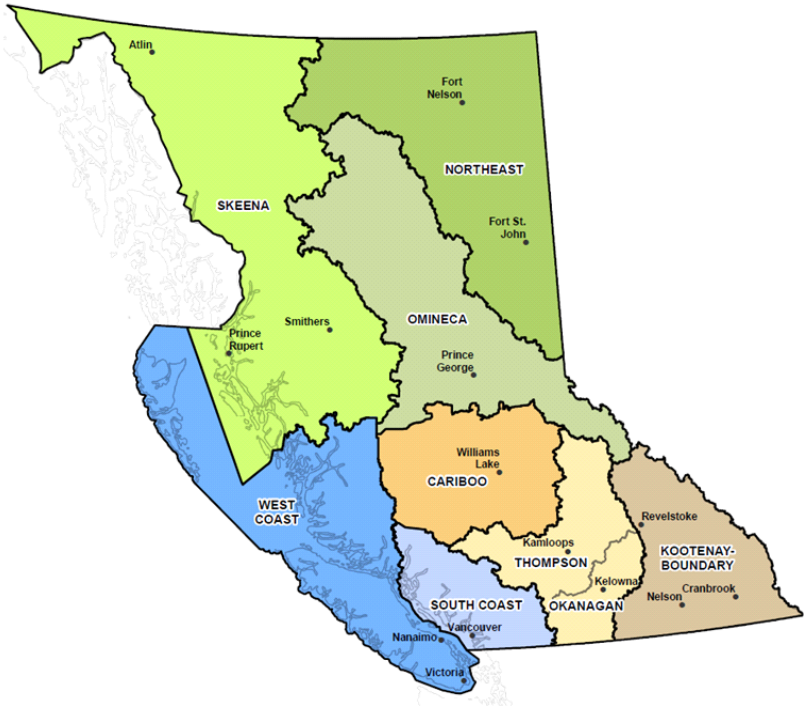
of Projects: 28

Status	Project Title	Delivery Region	Allocated $
Completed	Camera Effort Tool	Provincial	4,000
Ongoing	Broodstock Lake Temperature and Oxygen Monitoring to Assess Habitat Quality for Sexually Maturing Broodfish	Provincial	2,000
Ongoing	Technical support for Small Lakes Projects	Provincial	15,000
Ongoing	Provincial Fish Ageing Lab Development and Support	Provincial	25,000
			458,135





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

Project Categories	Allocated $
Angler Access & Infrastructure	$34,294
Angler Effort, Catch & Satisfaction	$190,243
Aquatic Invasive Species	$7,000
Data Standards, Tools & Management	$44,000
Habitat Maintenance, Restoration & Enhancement	$17,600
Management Plans	$10,000
Research & Development	$46,116
Stock Assessment	$108,882
	$458,135

Small Lake Nutrient Enrichment Program

Status: Completed

No report provided.

Tracking No. **S1713** **Year 3 of 3** **Total Spent to Date** **$23,475**

West Coast Region Lakes Angling Questionnaire

Status: Completed

No report provided - awaiting analyses.

Tracking No. **S1801** **Year 1 of 2** **Total Spent to Date** **$10,023**

Vancouver Island Small Lake Assessments

Status: Completed

No report provided - awaiting ages.

Tracking No. **S1815** **Year 1 of 1** **Total Spent to Date** **$10,172**

Assessment of Kawkawa Lake kokanee: fishery, stock and spawning

Status: Ongoing

This project aims to determine how best to manage kokanee in Kawkawa Lake. This is a wild population of large-bodied kokanee immediately outside Hope, BC and within 1.5 hours of Vancouver. The lake has three potential threats. The first is overfishing by a large population of Vancouver anglers drawn to this accessible, large-bodied stock. Prior to the onset of this study, fishing effort and catch was relatively unknown. The second potential threat is degradation of spawning habitat. The five spawning streams run through a shoreline community, where property owners have sometimes made changes to stream morphology and streamside vegetation. The third potential threat is due to nutrient influx from septic systems of property owners on the East side of the lake. This project aims to: (1) evaluate fishing effort and mortality; (2) assess spawning habitat; (3) estimate abundance; and (4) provide management recommendations based on appropriate population models. An additional objective has been added, which is to monitor nutrient levels and limnology to assess risk to eutrophication.

We have now completed field work for this project, which has included detailed creel surveys over two years (including direct questions aimed at assessing angler satisfaction in future scenarios), spawner assessments over two years, hydroacoustic surveys of kokanee abundance, spawning stream habitat assessments, complete limnology in one year and stable isotope analysis of fish and water samples. These data are currently being compiled and analyzed to determine threat to eutrophication and key population parameters. A population model has been built which will incorporate all findings from collected data and provide expected changes to the system if fishing regulations and/or habitat improvements are enacted given uncertainty in future nutrient conditions (all residences have been moved to sewer in recent years). A manuscript is being written which will provide a decision analysis to aid managers of Kawkawa Lake as well as for other kokanee populations in determining how best to manage the population to attain maximum angler satisfaction.

Tracking No. S1711 **Year 2 of 3** **Total Spent to Date $55,988**

Small Lakes Angler Access Project

Status: Completed

The Thompson Region contains around 1100 sports-fish bearing small lakes, approximately 200 of which are stocked annually. Combined effort over these lakes provides approximately 800,000 angler days per year. Improving or making modifications to the access will help provide new interest in a lake and provide easier access where improvements were needed, creating a diversity of angling opportunity across the region. The goal of this project is to manage small lake access that will provide new or improved opportunities for the angling public making fishing in BC even better. Manipulating access gives fisheries managers another tool for meeting the management objectives set for each lake.

This project involved implementing access improvements and modifications on a select group of lakes in the Thompson/Nicola Region. The six lakes selected (Andy, Hadlow, Monte, Nicola, Roche and Sullivan Lakes) provided a variety of access issues to peruse allowing the project to achieve its objectives. Project works included: road deactivation to help maintain walk-in angling opportunities, fix highway access to provide easier access for users, and boat launch upgrades and modifications to provide better boat launch facilities.

Tracking No. S1809 **Year 1 of 1** **Total Spent to Date $11,404**

Kamloops Small Lakes Assessment

Status: Completed

The Thompson Region contains around 1100 sports-fish bearing small lakes, approximately 200 of which are stocked annually. Combined effort over these lakes provides approximately 800,000 angler days per year. Prior to the initiation of the small lakes assessment program, virtually no recent ecological information was available for over 95% of these lakes. Assessment results allow fisheries managers to adjust future stocking plans to ensure that suitable stocking densities and/or strains are being utilized to optimize the deliverable product to the anglers. Documentation of these successes or failures is key in selecting appropriate strategies for future management decisions.

This project involved assessment of a selected group of 13 individual lakes to determine if stocking rates and/or strains are producing an acceptable product and achieving the specific targets set for the lake. The goal is to maintain or enhance the attraction of each lake to the angling public. These assessments allow the small lake biologist to analyse the results, and make the appropriate adjustments to the Freshwater Fisheries Society's stocking request form. As well, the data collected from the assessments furthers our understanding of each lake's physical attributes, which strengthens our ability to deliver on our region's Small Lake Operational Plan. Assessments also contribute to delivering on the fish culture commitments, FFSBC research section understanding of stock performance, and the development of new initiatives (family and mixed-stock fisheries).

Tracking No. S1816 **Year 1 of 1** **Total Spent to Date $16,000**

Plan for Small Lakes Recreational Fisheries in the Kootenay Region of British Columbia

Status: Completed

The Region 4 Small Lakes Plan is intended as a template to guide future plans in other Regions. In addition to the plan itself, an annotated version will include supplements that document the Supply Methodology and Demand Methodology as well as Notes and footnotes that outline the purpose, format and layout of each section. A third document (Supply Protocol) describes the procedure for estimating amount and type of angling opportunities available in a Region. A fourth document (Demand Protocol) describes the procedure for predicting the new distribution of angler effort in terms of changes in amount of effort and the type of anglers at each location. The intention is to have these documents reviewed and revised by Regional biologists before stripping out extraneous material to produce the actual Region 4 Plan. The annotated document and the final versions of the methodology appendices will be retained for future reference. The Supply and Demand Protocols will be reviewed by outside experts before creating Provincial-scale data summaries.

Tracking No. S1703 **Year 2 of 2** **Total Spent to Date $20,000**

East Kootenay High Effort Creel Surveys

Status: Completed

The 2017-2018 Premier Lake creel survey was successfully completed. The purpose of the survey was to determine angling effort and success at Premier Lake while determining the effect of harvest on brood stock recovery. A total of 247 angler interviews between May 10, 2017 and March 17, 2018 were conducted, representing 878 hours of fishing effort. In total, 601 rainbow trout (RB) were landed, and 158 were harvested. The average catch per unit effort (CPUE) for RB was 0.69 fish / hr. For eastern brook trout (EB), 14 were landed and 11 were harvested. The average CPUE for EB was 0.02 fish / hr. The combined CPUE for both species was 0.71 fish / hr. When possible we recorded lengths (n = 84), weights (n = 30), and fin clip observations (n = 74) from harvested RB. We most commonly observed clipped right ventral fins (n = 39) from brood year 2015. In general, the average condition factor (K) of RB from Premier Lake was 1.00, indicating there should be some concern for the quality of the fish in Premier Lake. However, most anglers reported being satisfied with the health of the fish and the overall angling experience at Premier Lake.

We have successfully completed the 2017-2018 Whiteswan Lake winter creel survey. We conducted a total of 280 angler interviews between December 27, 2017 and March 17, 2018, representing 904 hours of fishing effort. The average catch per unit effort (CPUE) was 0.55 fish / hr. In total, 524 rainbow trout (RB) were landed, and 219 were harvested. When possible we recorded lengths (n = 172), weights (n = 76), and fin clip observations (n = 76) from harvested RB. We observed a small number of RB (n = 5) with clipped adipose fins from brood year 2014, 2015, or 2016. In general, the average condition factor (K) of RB in Whiteswan Lake was 0.88, indicating there should be some concern for the quality of the fishery. This low measure is corroborated by the concerns of anglers, who have reported an increase in long, thin fish with minimal body mass.

We have successfully completed the 2017 Whitetail Lake creel survey. The purpose of this survey was to determine angling effort and success. We conducted a total of 148 angler interviews between May 10, 2017 and October 8, 2017, representing 684 rod hours of fishing effort. In total, 443 rainbow trout (RB) were landed, and 12 were harvested. The average catch per unit effort (CPUE) for RB was 0.65 fish / hr. For eastern brook trout (EB), 43 were landed and 25 were harvested. The average CPUE for EB was 0.06 fish / hr. The combined CPUE for both species was 0.71 fish / hr.
We recorded length and strain observations from 44 harvested RB. In total, 39% of observed RB were the Pennask Lake strain, and 32% were the Blackwater River strain. The average length for Pennask and Blackwater RB was 434 mm and 376 mm, respectively. Most anglers reported being satisfied with the health of the fish and the overall angling experience at Whitetail Lake.

Tracking No. S1810 **Year 1 of 1** **Total Spent to Date $15,914**

Kootenay Small Lake Assessments

Status: Completed

Resource Inventory Committee (RIC) standard small Lake assessments were conducted on Kootenay Region small lakes in 2017 to evaluate stocked fish performance. RIC standard floating and sinking nets were set overnight to capture fish that were measured, weighed, dissected for ageing structures, sex and maturity. Ageing structures were sent to the FFSBC ageing lab and results are pending. Data was entered into the FFSBC database and once ages are returned the database will be submitted to FFSBC. Reports for each lake will be published on Ecocat once age data is analysed.

Tracking No. S1814 **Year 1 of 1** **Total Spent to Date $20,000**

Kootenay flightline

Status: Ongoing

Small lake index monitoring (SLIM) aerial counts of anglers were conducted on 38 lakes on the Columbia Flight Line (CFL) during the spring and summer in 2017. Flights were conducted on 20 (14 lakes) or 21 (24 lakes) weekend days from May 7 to September 23. Aerial flight surveys maintain a long term data set and are integral to gathering data on angling effort at a large number of lakes over a short period of time. Angler effort was last monitored on the CFL in 2010 and effort in 2017 was 21% lower than during that time period (2008 to 2010 averaged).

Tracking No. **S1804** **Year 1 of 3** **Total Spent to Date** **$16,315**

Cariboo Small Lake Assessments

Status: Completed

Fifteen small lakes in the Cariboo Region were assessed primarily using standardized gill net methodology. Collected information was used to evaluate if fish populations were meeting size-based fishery objectives. Measures of growth, mortality, and abundance were used to recommend corrective actions if size-based objectives were not being met. Recommended management actions also aimed to improve cost effectiveness of hatchery resources.

Tracking No. **S1812** **Year 1 of 1** **Total Spent to Date** **$17,507**

Dragon Lake Risk Assessment

Status: Completed

No report provided - awaiting DNA testing to confirm species identification.

Tracking No. **S1819** **Year 1 of 1** **Total Spent to Date** **$7,000**

Williams Lake/Quesnel - Flight Line

Status: Ongoing

* 19 of the planned 20 boat counts were 100% completed on all 44 lakes by certified fixed wing operator.
* One flight was not completed due to weather deterioration.
* Boat counts entered into FFSBC effort database.

Tracking No. S1709 **Year 2 of 3** **Total Spent to Date $43,457**

Omineca Camera Effort Assessment

Status: Completed

Trail cameras were maintained at 4 stocked lakes in the Omineca Region in 2017. Two cameras were maintained at each of the Omineca Region's stocked kokanee lakes including Eena, Purden and West. One camera was applied at Verdant Lake which is in transition from a brook trout to rainbow trout fishery. Photos were downloaded every 4-6 weeks throughout the spring, summer, fall, and winter period. The camera sites were visited for a final time during March, 2018, and were left in-place over this spring capturing ice-fishing effort, and for additional years of year-round effort trend monitoring data. Reconyx HC500 cameras were used with lithium batteries during this year which led to a successful continuous operation at all sites in 2017-2018.

Tracking No. S1806 **Year 1 of 1** **Total Spent to Date $9,410**

Omineca Small Lake Assessments

Status: Completed

Standard RIC stock assessments were completed on nine small lakes in the Omineca Region, four of these lakes (Dina #1, Dina #2, Casey, and Square) were assessed to support the 3-g fry study. Collected information will be used to evaluate if fish populations are meeting size-based fishery objectives for each lake, and to improve stocking prescriptions and cost effectiveness of stocking efforts. Stock assessment reports are pending results of age structure interpretation provided by the FFSBC aging lab

Tracking No. S1813 **Year 1 of 1** **Total Spent to Date $22,661**

Omineca Kokanee Creel Survey

Status: Ongoing

Winter effort data on Purden Lake is unknown to date, presumed to be lower than average for front country Region 7a lakes. Winter angling effort was monitored for the first time in 2016/17 using remote cameras; utilizing the image data a project entailing a single winter of kokanee creel on Purden Lake was performed in winter 2017-18 targeting peak angling times (minimum 4 shifts per month), so that the 'pre-KO' data set includes one winter and one open-water season on Purden Lake. To ensure that the fishery is attended, it is recommended that the 'post-KO' creel occur in 2019-20 to determine levels of angling effort attributable to a KO fishery. A conservation benefit may include documenting potential changes in burbot exploitation resulting from the anticipated increased effort attracted by recent kokanee stocking efforts.

Tracking No. **S1720** **Year 2 of 3** **Total Spent to Date** **$19,075**

Omineca Flightline – Prince George

Status: Ongoing

The data report for year 1 of 3 was submitted in December 2017. In year one, a total of 54 lakes were flown on each of 18 flights during the open water period. Smoke emitted from 2017 BC wildfires had some influence on the flights. Boat counts have been entered into the FFSBC effort database, and a full analysis and reporting will be completed following year 3.

Tracking No. **S1803** **Year 1 of 3** **Total Spent to Date** **$34,967**

Small Lakes Access and Signage Review

Status: Completed

Over time, recreational activities, industry practices, and development have significant impacts on the condition of access roads and trails for regional lakes. Out of date regulation/educational signage can lead to confusion and a negative angling experience. The above two issues can lead to a negative public opinion of fisheries management. These issues were addressed through the Small Lakes Access Signage project. Objectives for this project were the review of access and signage for 50 small lakes with specific "non-regional" regulations. This was achieved by on site field visits to over 100 lakes by project end. Results showed over 80% of small lakes in the region had out of date access and signage issues. Recreational fishery benefits gained from this project include updated signage, documented access issues and a better understanding of the regional lakes on the landscape.

Tracking No. **S1718** **Year 2 of 2** **Total Spent to Date** **$26,243**

Okanagan Small Lakes Stock Assessment

Status: Completed

In the Okanagan region, FLNRORD biologists routinely receive complaints around decreased fish size and overall angling quality on small lakes. A standardized RIC stock assessment is used to address underlying stock issues and address them through changes in management classification, stocking prescription, regulation suite, or access management. Additionally, stock assessments are used to set baselines for fisheries where management changes are planned and stock dynamic responses are to be used as a success indicator. In 2017, 17 of these assessments were completed.

Tracking No. **S1811** **Year 1 of 1** **Total Spent to Date** **$7,478**

Okanagan Flight Lines

Status: Ongoing

Aerial boat counts are used to track angler effort on Okanagan small lakes. This is the primary performance measure used to estimate angler utilization and satisfaction for small lakes fisheries in the region. Identifying lakes with notable declines in effort allows FLNRO staff to further investigate the conditions contributing to these declines and exercise management options to improve the quality of the fishery, and subsequently the angler satisfaction derived from it.

Tracking No. **S1802** **Year 1 of 3** **Total Spent to Date** **$17,900**

Peace Camera Counts

Status: Completed

Mid-cycle funding was provided part way through the summer, and the purchase of cameras and other gear, as well as obtaining a qualified contractor was not completed until the fall. With a later start on this project, a good portion of the year that anglers could fish open water conditions would not have been captured. A decision was made to purchase cameras and associated gear to increase the capacity for this project to begin early in the 2018/2019 fiscal year. Consequently, activities associated with this project were deferred a year. Funding has been provided by the FFSBC Small Lakes Committee for this project in 2018/2019.

Tracking No. **S1818** **Year 1 of 1** **Total Spent to Date** **$3,636**

Peace Small Lakes Assessment

Status: Completed

Small lakes stock assessments are crucial to examine the current status of stocked and wild fisheries. Small lakes fisheries are limited in the Northeast, consequently, the stocked fisheries are a Regional priority to bolster a diversity of angling opportunities. Northeast stocked fisheries provide opportunities to angle rainbow trout and brook trout in a range of experiences from family fisheries to trophy-style fisheries. The 2017 stock assessment project aimed to evaluate the current status of several stocked fisheries and determine if they are meeting management expectations. While age data are required for a more thorough analysis, generally, the fisheries assessed in this project are meeting management objectives. Inga Lake and Sundance Lake experienced near complete winterkill events due to the late onset of aeration operations in winter 2016/2017. Inga and Sundance have each been stocked with the usual regime of yearling rainbow trout and were also stocked with additional catchable-sized rainbow trout – a trend that will continue for the 2018 stocking event. It is anticipated that both Inga Lake and Sundance Lake will experience a quick recovery in these family-style fisheries. Boot Lake and One Island Lake are also currently meeting management objectives as quality- and memorable/trophy style fisheries, respectively. Boot Lake boasts a moderate catch rate of good sized rainbow trout and brook trout. One Island Lake supports trophy-style rainbow trout fishing, with fish rumoured to exceed 10 lbs, as well as a memorable angling experience with good sizes of brook trout available to capture. Catch rates at One Island Lake have been trending downward when compared to recent surveys, suggesting potential increase in angler effort and/or harvest, or that the stocking regime has not met expectations. Angler effort assessments are recommended on many of the Northeast fisheries to obtain effort information that will support changes in stocking regime and/or changes in fishery regulations. It is anticipated that small lakes fisheries will continue to be assessed in the Northeast and that priority is for lakes that have not been assessed in recent history.

Tracking No. S1820 **Year 1 of 1** **Total Spent to Date $4,515**

Monitoring Stock Lakes Water Chemistry

Status: Completed

Management tools are being developed which require updated and complete information on productivity and pH of the stocked lakes, however, this data was not available on many lakes and was outdated in many more. Through cooperation of FFSBC's operation division all stocked lakes have continuously been monitored since 2015. This data is now available to all biologists to utilize for individual lakes assessments as well as global model creation which will aid in management decisions.

Tracking No. S1610 **Year 3 of 3** **Total Spent to Date $9,670**

Horsefly Rainbow Trout Strain Development Support

Status: Completed

Rainbow trout from the Blackwater River system wer developed in the 1990s for stocking into lakes with competitive environments. Blackwater rainbow provide excellent fisheries across BC; however, their performance in highly competitive, mixed species lakes has been variable. As over half the lakes in BC contain non-game species, recreational benefit could be substantial if a more suitable strain can be found. In order to choose the best possible strain for mixed-species lakes, strains have to be evaluated against one another in a variety of environments. FFSBC is currently assessing the Carp Lake strain (from Carp Lake, BC) which has shown improved performance over Blackwater rainbow trout in the most competitive lakes; however, while this result is promising, more than one potential option needs to be assessed. Horsefly River rainbow trout have been proposed as another potential candidate as they appear to have many attributes required to thrive in competitive environments.

The goal of assessing Horsefly River rainbow trout (and Carp Lake strain) against Blackwater strain is to determine if either strain performs better and more consistently than do Blackwater in competitive mixed species lakes. The end product of these assessments would inform decision making whether or not to replace the Blackwater strain.

To assess the performance of 2n Horsefly River rainbow trout strain, the strain will be stocked along with size-matched yearling 2n Blackwater strain each spring, for three consecutive years. Five research lakes have been selected, varying from low to high densities of competitor species. Gillnet assessments will take place in 2018. Performance metrics will include growth, relative survival, age at maturity, and stomach contents.

This project involves a significant amount of cost sharing between FFSBC and FLNRO (Region 5). Region 5 staff perform all the brood fish capture and transport all brood fish to a temporary holding facility. This involves 6-8 days of angling, travel, fuel, jet boat use, and coordinating volunteers. Region 5 staff have also agreed to lead the assessments of the remaining three lakes in 2019 (Elk, Greenlee, Rimrock).

Tracking No. S1612 **Year 3 of 3** **Total Spent to Date $40,541**

Camera Effort Tool

Status: Completed

Time-lapse cameras were first evaluated in the field in 2006, and started being used widely across the province by 2009. Unfortunately, a consistent method for analyzing these data were slow coming. An interim method was introduced in 2012, but a final method to impute seasonal fishing effort from cameras by comparing ground and camera observations was not complete until 2014 (van Poorten et al. 2015). Unfortunately, this method is not available to regional biologists.

The objective of this project is to update the computer code used to estimate fishing effort from cameras. This code will be orders of magnitude faster than the original method and will be run once per year. The code will be transferred to the Freshwater Fisheries Society of BC, allowing annual estimates of fishing effort to incorporate all available information in the Small Lakes Database.

Tracking No. S1817 **Year 1 of 1** **Total Spent to Date $4,000**

Broodstock Lake Temperature and Oxygen Monitoring to Assess Habitat Quality for Sexually Maturing Broodfish

Status: Ongoing

Environmental variables, particularly temperature and oxygen, determine which habitats are used by fish. High temperatures during sexual maturation can have detrimental effects on egg quality, and fish survival. Even when lake thermal profiles indicate that optimal thermal habitat is available, fish may be constrained to warmer waters due to hypoxic conditions in cooler strata. Historically, thermal and oxygen data on FFSBC broodstock lakes has been sparse. In 2014 and 2015, we successfully retrieved thermal loggers from Aylmer Lake, and constructed time-series depth profiles for lake water temperature from spring to fall. We supplemented this data with temperature and oxygen profiles collected manually. The data indicate that 2-3 vertical meters of optimal thermal habitat are available for maturing brook char (7-13°C; Fish Hatchery Management, USFWS 1982), even when air and lake surface temperatures are at their warmest. The data also allow us to understand the thermal experience of fish cruising the shoals in preparation for spawning. We do not plan to deploy loggers in Aylmer Lake again for the remainder of this project.

In 2014, 2016, and 2017, we successfully retrieved thermal loggers from Dragon Lake, and these data, in conjunction with dissolved oxygen profiles collected semi-monthly (data supplied by MOE), indicate that broodstock rainbow trout are likely living at the edge of their thermal tolerance in July and August (22-26°C). Even a relatively small increase in summer water temperature could result in a collapse of this population. We plan ongoing annual temperature-at-depth monitoring in Dragon Lake to investigate possible correlations between environmental characteristics within the lake and egg quality and survival, and to contribute to the understanding of how invasive goldfish populations are interacting with the lake ecology. In 2016 and 2017, temperatures in Tunkwa Lake were consistently <20°C and so presumably well tolerated by rainbow trout. Ongoing monitoring is planned for this lake for at least the remainder of this project.

Thus far, the only setback this project has experienced was in 2015, when loggers were deployed in four FFSBC broodstock lakes (Aylmer, Beaver, Dragon, and Tunkwa) but failed to be retrieved in any lake but Aylmer, due to suspected theft. For the remainder of the project we will focus on continuing to gather data from Dragon and Tunkwa Lakes, since they are shallow and reach high summer water temperatures throughout their depth, and initiate thermal monitoring on Barnes Lake in Region 3, which has been identified and stocked as a potential future broodstock lake.

Tracking No. **S1511** **Year 4 of 5** **Total Spent to Date** **$1,527**

Provincial Fish Ageing Lab Development and 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**

Technical support for Small Lakes Projects

Status: Ongoing

This is an ongoing Project to provide technical support to the Small Lakes Committee including:
* Development of a protocol for estimating the supply of fish production and potential angling activity using data from t Small Lakes database and the Freshwater Atlas.
* Assembly of the Fish and Angling Capacity data for Regio 4.
* Assisting in the development of the protocol for estimating the amount and type of demand for angling activi (data assembly, review) using data from the Small Lakes database and the Freshwater Atlas.
* Miscellaneous small requests to provide data, simple analysis and review from a variety of partners from FFSBC, Prov of BC and academic institutions.

Tracking No. S1807 **Year 2 of 3** **Total Spent to Date $15,000**