Evaluation of an Experimental Re-introduction of Sockeye Salmon into Skaha Lake

Year 3 of 3

Technical Report
2002

DOE/BP-00005136-3

May 2003

This Document should be cited as follows:

Evelyn, Trevor, Shayla Lawrence, Fabian Alexis, Herb Alex, Karilyn Long, Christopher Fisher, Robert Newbury, Howie Wright, Adrienne Vedan, Calvin Peters, David Marmorek, Ian Parnell, Howard Smith, "Evaluation of an Experimental Re-introduction of Sockeye Salmon into Skaha Lake; Year 3 of 3", 2002 Technical Report, Project No. 200001300, 471 electronic pages, (BPA Report DOE/BP-00005136-3)

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This report was funded by the Bonneville Power Administration (BPA), U.S. Department of Energy, as part of BPA's program to protect, mitigate, and enhance fish and wildlife affected by the development and operation of hydroelectric facilities on the Columbia River and its tributaries. The views in this report are the author's and do not necessarily represent the views of BPA.

This report has been divided into sections to facilitate file viewing, downloading, and printing
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The PREFACE page provides links to the each of the 6 Objectives and the
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Evaluation of an Experimental Re-introduction of Sockeye Salmon into Skaha Lake: Year 3 of 3

Submitted to:
Colville Confederated Tribes

Submitted by:
Okanagan Nation Fisheries Commission

May 2003

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PREFACE

The Okanagan Nation Alliance in Canada and Colville Confederated Tribes in the U.S. have proposed re-introducing sockeye salmon to their historic range (Figure 1). The purpose of this project has been to assess the risks and benefits of an experimental sockeye re-introduction into Skaha Lake, by completing the following six objectives over three years:

1. Disease risk assessment;
2. Exotic fish risk assessment;
3. Inventory of sockeye salmon habitat and opportunities for habitat enhancement;
4. Development of a life-cycle model of sockeye, including interaction with resident kokanee;
5. Development of an experimental design and;
6. Finalization of a plan for re-introduction of sockeye salmon into Skaha Lake and associated monitoring programs.

The following compilation of reports includes the third year of assessments for Objectives 1 – 3, the model design document for Objective 4, experimental design strategies for Objective 5 and a 2000 - 2003 project summary for Objective 6. For a full list of reports completed over the three years of the project, please refer to Table 1.

The actual re-introduction and monitoring plan is currently being developed based upon options and strategies identified during the Year 3 analyses review workshop in March 2003. The information contained in this plan, as well as the information gathered from the re-introduction itself, will support future decisions on protection and restoration strategies for the Okanagan River sockeye stock.

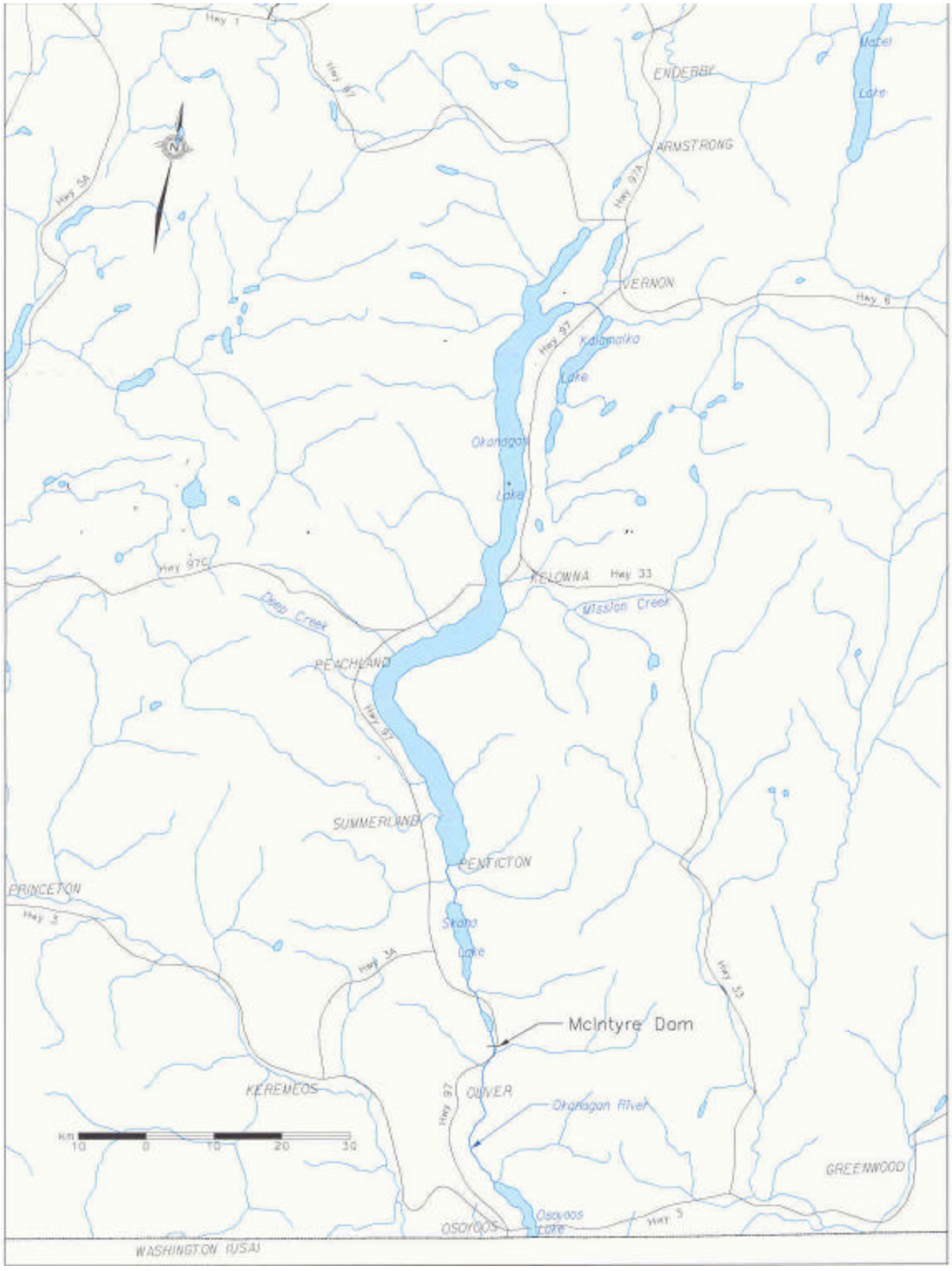

Figure 1. Overview of the Canadian Okanagan Basin

Table 1. A list of Project objectives, tasks and reports.

OBJECTIVE	TASKS	REPORTS / STATUS
1 Disease Risk Assessment	**A** – sample collection, diagnostic test, data entry, data analysis **B** - evaluate risk for developing disease or potential for introduced infectious agents **C** – Assess whether re-introduced sockeye interact with resident fish	*Disease Risk Assessment* Year 1, Year 2 and Year 3
2 Exotic Fish Risk Assessment	**A** –Review fish inventory information	✒ *Review available fish inventory information in the Okanagan River system below Skaha Lake, and in Skaha and the southern portion of Okanagan Lake* and ✒ *Interaction of kokanee and rainbow trout with exotic species*
	B- Inventory exotic fish species and habitat	*Exotic Fish Species Risk Assessment* Year 1, Year 2 and Year 3
	B1 – sample predator community in the Zosel Dam tailrace	*Results of sockeye smolt predator sampling in the forebay and tailrace of Zosel Dam* Year 2 and Year 3
	C- Complete literature review of habitat requirements for exotic species of concern	✒ *Habitat requirements for exotic species identified as being present in the Okanagan system below Skaha Lake but not in Skaha or Okanagan Lake* ✒ *Literature review of habitat requirements for exotic species of concern (bluegill)* ✒ *Historical habitat of salmon of the Okanagan River* ✒ *North American Lakes where kokanee, rainbow trout and sockeye occur with exotic species* ✒ *Leaping abilities of exotic species of concern* ✒ *Movement and colonization of walleye* ✒ *Consumption of incubating salmon eggs by black bullheads (Ameriurus melas)*
	D – Assess availability of suitable habitat requirements for exotic species and likelihood of these species becoming established in Skaha Lake **E**- Compile information from Tasks A to D	*Exotic Fish Species Risk Assessment* Year 1, Year 2 and Year 3

3 Inventory sockeye habitat and identify opportunities for enhancement	**A** - Review literature for evidence of beach or stream spawning plasticity in sockeye salmon	*Evidence of beach-stream spawning plasticity in sockeye salmon populations and to determine attributes of sockeye spawning and incubation habitat*
	B –Identify potential spawning habitat in the study area	*Sockeye Salmon Habitat Assessment* Year 1 and Year 2
	C – Identify opportunities for sockeye habitat enhancement and development	- *Discussion of spawning areas enhancement and opportunities* - *Okanagan River (Reach A and B) spawning area restoration feasibility*
	D – Assess potential rearing conditions in Vaseux, Skaha and Okanagan Lakes	*Assessment of juvenile Oncorhynchus nerka (sockeye and kokanee) rearing conditions of Skaha and Osoyoos Lakes* Year 2 and Year 3
4 Develop life-cycle Model of Okanagan	**A** – Review literature on life-cycle of Okanagan Salmonids **B** - Design document of model **C** – Review model structure & assumptions **D** – Model development **E** – Develop user interface **F** – Document	*Ok Sockeye: A simple life-cycle model of Okanagan Basin sockeye salmon Version 2.2 Design Document and User's Guide*
5 Development of an experimental design	**A –** Multi-agency workshop to review existing information **B** – survey /compile baseline data to test hypotheses **C** – design alternative implementation designs and monitoring programs to collect data **D** – Test alternative designs and monitoring programs in context of entire life-cycle using life-cycle model	*Evaluate Alternative Experimental Strategies for Reintroducing Sockeye Salmon to Skaha Lake*
6 Finalize plan for experimental re-introduction of sockeye salmon into Skaha Lake and associated monitoring programs	**A –** Multi-agency workshop to: review results of Objective 1-5 and develop experimental management plan; develop workplan for obtaining necessary approvals and additional funding	*An evaluation of a proposed experimental reintroduction of sockeye salmon into Skaha Lake: Project summary 2000-2003*
	B – Obtain necessary funding/approval for implementation of plan	In progress
	C – Multi-agency workshop to review progress on obtaining approval/funding; finalize plans for experimental re-introduction	In progress

Acknowledgements

The Okanagan Nation Alliance would like to thank a number of organizations and individuals who have made valuable contributions to various aspects this project and our work over the past three years. We truly could not have done it without you!

Thank you to the Bonneville Power Administration for providing funding for this project. This has been an important contribution towards securing the future of Okanagan sockeye.

To the Colville Confederated Tribes, especially Joe Peone, Chris Fisher, Monte Miller and Cindy McCartney – thank you for working with us to honour the spirit of the salmon and the knowledge of our ancestors.

Thank you to the Canadian Okanagan Basin Technical Working Group representatives for providing valuable input and guidance into the design and review of the project.

For all of the technical support and assistance we have received from the following individuals, we thank you for the knowledge and insights that you have shared with us:

> Fisheries and Oceans Canada Staff: Dr. Kim Hyatt, Paul Rankin, Elmer Fast, Dave Smith, Garth Traxler, John Richard, and Barry Hanslit.
>
> Ministry of Water Land and Air Protection Staff: Steve Matthews, Vic Jensen, Andrew Wilson, Sally Goldes, Sherri Guest, and Tina McCann.
>
> Independent Contractors: Chris Bull, Dr. Trevor Evelyn, Dave Marmorek with Calvin Peters and Ian Parnell (ESSA Technologies), Dr. Larry Hammell, Carol Cooper and Al Hirst (AMC Labs), Dr. Robert Newbury, Howard Smith, Brent Phillips (Summit Environmental Consultants), Mark Siemens and Klaus Wolff (Summerland Hatchery), Lee Granberg, Jason Webster, and Dave Cassidy.

And, saving the best for last, to all of the Okanagan Nation Alliance Fisheries Department Staff who have been involved with this project and who worked tirelessly, and with good humour, in fair and foul weather to collect the data, complete the reports and attend a LOT of project meetings, you have our heartfelt gratitude: (in alphabetical order) Dion Alex, Herb Alex, Fabian Alexis, Neil “Nibs” Baptiste, Stacey Bonneau, Shayla Lawrence, Kalum Lezzard, Byron Louis, Keith “Yogi” Louis, Kari Long, Dawn Machin, Deana Machin, Alfred Snow, Bob Swite, Adrienne Vedan, Howie Wright, and the 2001 “E-Team”.

2003 Contributions to *An Evaluation of an Experimental Re-introduction of Sockeye Salmon into Skaha Lake: Year 3 of 3*

1. Disease Risk Assessment
2. Exotic Fish Species Risk Assessment
3. Results of Sockeye Fry Predator Sampling in Osoyoos Lake
4. Results of Sockeye Smolt Predator Sampling in the Forebay and Tailrace of Zosel Dam
5. Okanagan River (Reach A and B) Spawning Area Restoration Feasibility
6. Assessment of Juvenile *Oncorhynchus nerka* (Sockeye and Kokanee) Rearing Conditions of Skaha and Osoyoos Lakes 2002
7. Historical Habitat of Salmon of The Okanagan River
8. North American Lakes Where Kokanee, Rainbow Trout and Sockeye Occur with Exotic Species
9. Leaping Abilities of Exotic Species of Concern
10. Movement and Colonization of Walleye
11. Consumption of Incubating Salmon Eggs by Black Bullheads
12. OkSockeye: A Simple Lifecycle Model of Okanagan Basin Sockeye Salmon Version 2.2: Design Document
13. Evaluate Alternative Experimental Strategies for Re-Introducing Sockeye Salmon to Skaha Lake
14. An Evaluation of a Proposed Experimental Re-Introduction of Sockeye Salmon into Skaha Lake: Project Summary 2000-2003