

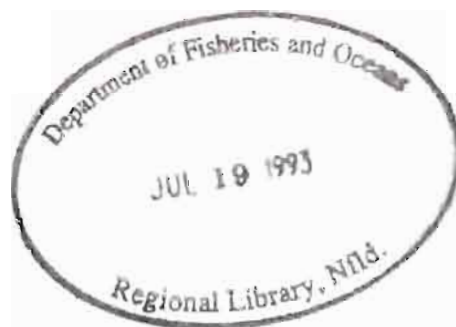


Scientific Excellence • Resource Protection & Conservation • Benefits for Canadians  
Excellence scientifique • Protection et conservation des ressources • Bénéfices aux Canadiens

## Owikenno Lake (Rivers Inlet, Statistical Area 9) Fall Sockeye Salmon Escapement Survey 1992

S.K. Bachen, I. Winther and R.D. Goruk

Department Of Fisheries and Oceans  
Fisheries Branch  
417 2nd Avenue West  
Prince Rupert, B.C.  
V8J 1G8



April 1993

Canadian Data Report of  
Fisheries and Aquatic Sciences  
No. 901



Fisheries  
and Oceans

Pêches  
et Océans

Canada

## **Canadian Data Report of Fisheries and Aquatic Sciences**

Data reports provide a medium for filing and archiving data compilations where little or no analysis is included. Such compilations commonly will have been prepared in support of other journal publications or reports. The subject matter of data reports reflects the broad interests and policies of the Department of Fisheries and Oceans, namely, fisheries and aquatic sciences.

Data reports are not intended for general distribution and the contents must not be referred to in other publications without prior written authorization from the issuing establishment. The correct citation appears above the abstract of each report. Data reports are abstracted in *Aquatic Sciences and Fisheries Abstracts* and indexed in the Department's annual index to scientific and technical publications.

Numbers 1-25 in this series were issued as Fisheries and Marine Service Data Records. Numbers 26-160 were issued as Department of Fisheries and the Environment, Fisheries and Marine Service Data Reports. The current series name was introduced with the publication of report number 161.

Data reports are produced regionally but are numbered nationally. Requests for individual reports will be filled by the issuing establishment listed on the front cover and title page. Out-of-stock reports will be supplied for a fee by commercial agents.

## **Rapport statistique canadien des sciences halieutiques et aquatiques**

Les rapports statistiques servent à classer et à archiver les compilations de données pour lesquelles il y a peu ou point d'analyse. Ces compilations auront d'ordinaire été préparées à l'appui d'autres publications ou rapports. Les sujets des rapports statistiques reflètent la vaste gamme des intérêts et des politiques du ministère des Pêches et des Océans, c'est-à-dire les sciences halieutiques et aquatiques.

Les rapports statistiques ne sont pas destinés à une vaste distribution et leur contenu ne doit pas être mentionné dans une publication sans autorisation écrite préalable de l'établissement auteur. Le titre exact paraît au-dessus du résumé de chaque rapport. Les rapports statistiques sont résumés dans la revue *Résumés des sciences aquatiques et halieutiques*, et ils sont classés dans l'index annuel des publications scientifiques et techniques du Ministère.

Les numéros 1 à 25 de cette série ont été publiés à titre de relevés statistiques, Services des pêches et de la mer. Les numéros 26 à 160 ont été publiés à titre de rapports statistiques du Service des pêches et de la mer, ministère des Pêches et de l'Environnement. Le nom actuel de la série a été établi lors de la parution du numéro 161.

Les rapports statistiques sont produits à l'échelon régional, mais numérotés à l'échelon national. Les demandes de rapports seront satisfaites par l'établissement auteur dont le nom figure sur la couverture et la page du titre. Les rapports épuisés seront fournis contre rétribution par des agents commerciaux.

Canadian Data Report of  
Fisheries and Aquatic Sciences No. 901

April 1993

Owikenno Lake (Rivers Inlet, Statistical Area 9)

Fall Sockeye Salmon Escapement

Survey 1992

by

S.K. Bachen, I. Winther and R.D. Goruk

Department of Fisheries and Oceans

Fisheries Branch

Prince Rupert, B.C.

V8J 1G8

© Minister of Supply and Services Canada 1993  
Cat. No. Fs 97-13/0901E ISSN 0706-6465

Correct citation for this publication:

Bachen, S.K., I. Winther and R.D. Goruk. 1993. Owikeno Lake  
(Rivers Inlet, Statistical Area 9) fall sockeye salmon  
escapement survey 1992. Can. Data Rep. Fish. Aquat. Sci.  
901: iii + 16 p.

# **ABSTRACT**

Bachen, S.K., I. Winther and R.D. Goruk. 1993. Owikeno Lake (Rivers Inlet, Statistical Area 9) fall sockeye salmon escapement survey 1992. Can. Data Rep. Fish. Aquat. Sci. 901: iii + 16 p.

Rivers Inlet sockeye salmon stocks spawn in the Owikeno lake system (Canada Department of Fisheries and Oceans, Statistical Area 9). Tributaries of Owikeno Lake are surveyed annually to enumerate sockeye escapement. In 1992 a total of 343,000 sockeye escaped to the Owikeno lake system. Six representatives of the commercial fishing industry accompanied department staff during the industry tour. This report summarizes the 1991 fall enumeration survey. Operation of the Genesee camp and required repairs are outlined.

# **RESUME**

Bachen, S.K., I. Winther and R.D. Goruk. 1993. Owikeno Lake (Rivers Inlet, Statistical Area 9) fall sockeye salmon escapement survey 1992. Can. Data Rep. Fish. Aquat. Sci. 901: iii + 16 p.

Les saumons rouges qui reviennent de l'inlet Rivers frayent dans le reseau du lac Owikeno (zone statistique 9, Peches et Oceans Canada). On fait chaque annee un releve des tributaires du lac Owikeno pour faire le denombrement lors des echappees de saumons rouges. En 1992, 343,000 saumons rouges se sont diriges vers le reseau du lac Owikeno. Six representants du secteur de la peche commerciale ont accompagne les employes du Ministere lors des evaluations. Le present rapport donne un resume des releves effectues a l'automne de 1991. Il decrit egalement le fonctionnement du camp Genesee et les reparations qui doi ent etre apportees.



## INTRODUCTION

Owikeno Lake (Statistical Area 9) is one of the largest sockeye salmon (*Oncorhynchus nerka*) producing systems in the Central Coast. Sockeye returning to Owikeno Lake support major commercial fisheries in Rivers Inlet.

Sockeye salmon are enumerated in spawning streams of Owikeno Lake annually from September to October (Winther, Bachen & Goruk 1989, Bachen, Spilsted & Goruk 1990, and Bachen, Winther & Goruk 1991). Full descriptions of the watersheds have been documented by Thomson, Bachen & Goruk (1988).

## METHODS & RESULTS

Machmell Camp was open from September 1 to October 20, 1992. Two field staff were hired from September 1 to October 20 to carry out stream enumerations and camp duties.

River systems were surveyed approximately every ten days, weather and water conditions permitting. Escapements for sockeye streams appear in Table 1. Systems were usually walked or boated to a regular site where the survey was terminated. These sites exist where obstacles prevent fish from continuing up the river or where crews cannot proceed. Table 2 documents the usual distance surveyed in each system and the distance surveyed in 1992. Table 3 lists the daily record of sockeye escapement surveys in 1992. Most of the streams exhibited low escapements in 1992. Exceptions and enumeration difficulties are noted below. Daily weather and lake levels appear in Table 4.

Annual sockeye sampling continued in 1992 with the collection of post orbital to hypural length (POH), nose to fork length (NF), sex and otoliths from all streams surveyed in Owikeno Lake. Scale samples were included in 1992 to improve ageing of the lacustrine portion of the sockeye life history. Female carcasses were sampled for egg retention. Objectives were to sample 100 carcasses from each tributary of Owikeno Lake. Samples were collected from the Ashlulm, Inziana, Neechanz, Washwash and Wannock Rivers. It was difficult to collect carcasses in the Tzeo, Genesee, and Machmell systems due to high water, low escapement and/or heavy bear predation. Samples included 100 fish from the Ashlulm and Inziana Rivers, 95 from the Washwash River, 47 from the Wannock River and 8 sockeye from the Neechanz River. Wannock river sockeye samples were collected using a beach seine and could not be sampled for egg retention. Data collected from these systems appear in Appendices 1 through 5.

Sampling nets used for abundance estimates were the same as in previous years. Gillnet drift sets were made with a 15 m (50 ft) length of gillnet 3 m (10 ft) deep. Dimensions of

the beach seine were 60 m (200 ft) long and 6 m (20 ft) deep. Nets were set from a 5.5 m (18 ft) aluminum river boat with a 115 hp jet outboard motor.

#### GENESEE CREEK.

Genesee creek received an escapement of 500 sockeye in 1992. Most of the fish entering this system were eaten by bears. High water could have helped the fish escape. This creek would benefit from enhancement.

#### INZIANA RIVER.

Total sockeye escapement to the Inziana River was 30,000. No fish were observed when this system was first inspected on August 11. Spawning sockeye were observed from early September to mid October. Water conditions were silty throughout the period.

The dike blocking the Inziana breakthrough (1988) was still effectively diverting most of the water back to the main spawning beds in the lower portion of the river. However, the river has continued to erode the upper dike at the site of the old breakthrough making further repairs necessary. Very high water levels in mid September caused heavy silting over portions of the spawning beds below the dike resulting in substantial egg loss.

#### MACHMELL RIVER.

The Machmell River was surveyed twice in 1992, once by helicopter and once by jet boat. The river was surveyed by helicopter as far as the first logging bridge. Clear Creek, located approximately 100 meters below the bridge, was also surveyed. The Machmell system was very silty, making fish countability nil in the main river. A few sockeye were observed in the shallow side channels. Clear Creek was low, allowing fish to be counted easily. The side channel from the Machmell bridge site into Clear Creek was blocked by a natural build up of gravel. Dirty water from the Machmell did not obscure fish in the lower portion of the creek as in previous years.

The Machmell River was channelized and fast, making it difficult to drift net or seine. A jet boat was run approximately half way to the bridge site from the confluence of the Machmell and Neechanz. Few fish were observed from the jet boat. A drift net was used at four sites for a total catch of 13 sockeye, one jack sockeye and 20 coho. Sockeye escapement was estimated at 5,000.



NEECHANZ RIVER.

Sockeye escapement to the Neechanz River was 30,000. No spawning activity was observed during an inspection on August 11, but a jumper was seen in the "Coho Pool". Counting conditions were fair in September and October. Water levels in the lower Neechanz River returned normal in 1992 as the confluence of the Machmell and Neechanz Rivers had moved back below the "Coho Pool". Water levels were elevated in 1991 when a channel of the Machmell River entered the Neechanz above the "Coho Pool". Otolith sampling in the Neechanz was difficult as grizzly bears ate most of the carcasses deposited on the banks and bars.

SHEEMAHANT RIVER.

The Sheemahant River had an escapement of 50,000 sockeye. Water conditions were fairly stable in 1992 but visibility remained poor due to glacial silt. Very few redds were visible in the shallows or on the gravel bars during fluctuating water conditions. The Sheemahant was inspected by helicopter on September 15th. There was a very poor showing of redds throughout the system. Redds were only observed in the lower river, below the bridge. There was no evidence of fish above the cascades. Fewer spawners and redds were observed on a second helicopter survey October 8th.

No beach seine sets were made September due to high water levels and insufficient staff when water levels were low enough to seine.

The Sheemahant River was surveyed to the bridge during the industry inspection October 13th. The river was too low to run jet boats over the riffle above the bridge. Three seine sets were made at sites below the bridge. The first set, just below the bridge (Site #1), caught 8 male sockeye, 7 female sockeye and 6 coho. Logs and root masses did not allow for a set at Site #2. At Site #3 the net snagged and ripped, catching nothing. A set at Site #4 caught 10 sockeye, 3 trout and 6 coho. Catches were among the poorest on record.

TZEO RIVER

The Tzeo was only inspected once in 1992 when water conditions were clear enough to see sockeye. The river was inspected on September 15th by helicopter. Most of the 3000 sockeye observed were spawning in the upper river, above the log jam. 40 chinook were observed in the upper river, below the logging bridge. Sockeye escapement to the Tzeo River was estimated at 5,000.

### WANNOCK RIVER

Escapement to the Wannock River was estimated at 100,000 sockeye. Enumeration was extremely difficult throughout the season as silty conditions prevailed. Water levels were normal during the industry inspection on October 15. Three seine sets were made at the "Top End" site during the Industry Tour. Set # 1 caught 87 sockeye, set # 2 caught 555 sockeye and set # 3 caught 652 sockeye. Seining conditions were good, with few snags on bottom debris. Indications of sockeye abundance were poor through the area from spring pool to the lake. Very few fish were observed behind Smoke House Island.

The Wannock River chinook escapement was estimated at 5300 females in 1992 (Winther 1993, in prep.). A total escapement of 10,000 was used for management purposes.

### WASHWASH RIVER

The Washwash River received a low escapement of only 20,000 sockeye in 1992. Spawning sockeye were observed from early September to late October. No chinook or sockeye were observed in the river or at the river mouth during an inspection on August 11.

Some repairs were done to stabilize the Washwash River. Temporary dikes built in 1988 have not washed out, but more rip-rap was added to critical areas. Logs and other debris were used to block new channels and to stabilize the two main stems. The river is still cutting new channels with every high water, and the loss of spawn is inevitable. A channel from the old to the new main stem is continually cutting deeper and will eventually take all the water from the remainder of the old main stem. Approximately 1800 meters of spawning area could be lost if this occurs.

On July 21st, an on site inspection was held between the Department of Fisheries and Oceans, the local native band and the Ministry of Environment, to discuss proposals for the stabilization of the Washwash River. The results of this meeting are still pending.

### INDUSTRY TOUR

The industry tour occurred from October 10 to 20, 1992. All of the systems were surveyed except for the upper section of Amback and Sheemahant Rivers. The weather during the tour was mixed with several days of heavy rain.

Industry representatives:

Name	Representing	Dates attended October
Dave Pashley	B.C. Packers, Prince Rupert	10-20
Gerry O'Connor	B.C. Packers, Prince Rupert	10-20
Jim Cameron	UFAWU	10-20
Marty Basso	Canadian Fishing Co.	10-20
Bonnie Brant	B.C. Packers, Vancouver	10-15
Glen Katnich	B.C. Packers, Vancouver	15-20

Fisheries representatives:

Name	Title	Dates attended October
S.K. Bachen	Technician	10-21
R.D. Goruk	Biologist	10-21
I. Winther	Biologist	10-21
B. Tupniak	Fishery Officer	10-20
D. Wagner	Ast. Dist. Sup.	11-21

OWIKENO LAKE MACHMELL CAMP 1992

The first trip into Machmell Camp in 1992 was on June 18th. The camp was in good condition, with very little damage from winter storms. Marten had been living in the Palace again, and left a considerable mess. Holes chewed in the ceiling and some of the inside doors will have to be repaired in 1993.

The remainder of camp was not damaged by marten. Floats required some minor repairs to planks and cables.

Water and propane systems were connected and repaired. Water had to be pumped from the lake because the small creek previously used for water was dry.

Several trips were made to the camp to connect the water to the buildings, bring in fuel (gas and diesel) and begin repairs. Most of the food for the fall program was brought into camp on these visits. A rebuilt 14 kw generator was transported from Dawsons Landing to the camp with the Sea Truck as a back up for the generator presently in use.

REPAIRS AND REPLACEMENTS

The "Palace" will require major renovations in 1993. This building has had very little maintenance in the past and will become inhabitable without repairs to the roof, ceiling and floors.

The plywood sheathing, vapor barrier and aluminum sheets will have to be replaced on the roof in order to stop the many leaks. New plywood will be needed to replace the rotten, water damaged ceiling presently in place. Some of the ceiling was replaced in 1992. New sub floors are required through out this building. Linoleum will be used as a floor covering. The building will be insulated and made marten and rodent proof as other repairs are done.

The aircraft float will have to be replaced this year as the old one is rotten and unsafe.

A gas shed has been purchased and will have to be erected on the fuel float. This will call for some modifications to the existing float. Fuel containment will have to be adapted to this facility.

Propane systems require inspection by qualified personnel.

The buildings in this facility require painting.

## REFERENCES

- Bachen, S.K., Spilsted B.P., Goruk R.D. 1991. Owikleno Lake (Rivers Inlet, Statistical Area 9) fall sockeye salmon escapement survey 1990. Can. Data Rep. Fish and Aquat. Sci. 833. iv + 23 p.
- Bachen, S.K., Winther I., Goruk R.D. 1992. Owikleno Lake (Rivers Inlet, Statistical Area 9) fall sockeye salmon escapement survey 1991. Can. Data Rep. Fish and Aquat. Sci. 883. iii + 16 p.
- Thomson, B.L., S.K. Bachen and R.D. Goruk. 1988. An historical overview of the Owikeno Lake (Rivers Inlet Statistical Area 9) fall sockeye salmon escapement surveys, 1971-1987. Can. Data Rep. Fish. Aquat. Sci. 711. iii + 69 p. + Appendices.
- Winther, I., S.K. Bachen and R.D. Goruk. 1989. Owikeno Lake (Rivers Inlet, Statistical Area 9) fall sockeye salmon escapement survey 1988. Can. Data Rep. Fish. Aquat. Sci. 754. iii + 11 p.
- Winther, I., S.K. Bachen and R.D. Goruk. 1990. Owikeno Lake (Rivers Inlet, Statistical Area 9) fall sockeye salmon escapement survey 1989. Can. Data Rep. Fish. Aquat. Sci. 794. iii + 13 p.
- Winther, I. 1993. 1992 Wannock River chinook salmon mark-recapture experiment. Can. Manuscr. Rep. Fish. Aquat. Sci. in prep.

TABLE 1. 1992 Escapement data for Owikeno Lake systems.

SYSTEM	1992 ESCAPEMENT
AMBACK	60,000
ASHLULM	25,000
DALLERY	15,000
GENESEE	500
INZIANA	30,000
MACHMELL	5,000
NEECHANZ	30,000
OWIKENO LAKE SPAWNERS	2,500
SHEEMAHANT	50,000
TZEO	5,000
WANNOCK	100,000
WASHWASH	20,000
TOTAL	343,000

TABLE 2. Distance to survey termination sites from the mouths of streams and distances surveyed during the 1992 Industry Tour.

SYSTEM	NORMAL DISTANCE SURVEYED (km)	DISTANCE SURVEYED DURING THE 1992 INDUSTRY TOUR (km)	MAXIMUM DISTANCE SURVEYED IN 1992 (km)
AMBACK	3.0	1.5	3.0
ASHLULM	3.5	3.5	3.5
DALLERY	3.8	3.8	3.8
GENESEE	1.3	1.3	1.3
INZIANA	1.6	1.6	1.6
MACHMELL	8.3	1.0*	1.0
NEECHANZ	4.0	4.0	4.0
SHEEMAHANT	6.0	6.0**	14.0
TZEO	4.5	1.0	4.5
WASHWASH	2.5	1.0	2.5

\* Machmell usually not surveyed.

\*\* Usually only survey to logging bridge.

TABLE 3. OWIKENO LAKE 1992 - DAILY RECORD OF SOCKEYE ESCAPEMENT SURVEYS.

DATE	STREAM	EST. NO. SOCKEYE			METHOD	WATER			COMMENTS
		LIVE	DEAD	%NEW		COND.	VIS.	LEVEL	
OCT 08	AMBACK	3000	LOTS		HLCPTR	CLEAR	GOOD	NORMAL	FISH THROUGHOUT.
OCT 16	AMBACK	8000	2500		WALK	CLEAR	EXCEL	NORMAL	FISH MAINLY IN LOWER END. TFY 60,000
SEPT 06	ASHLULM	2500	100	75	WALK	CLEAR	GOOD	NORMAL	FISH THROUGHOUT, MOST IN LOWER REACHES
SEPT 14	ASHLULM	6500			HLCPTR	CLEAR	EXCEL	NORMAL	MOST FISH IN LOWER HALF OF THE RIVER, LOTS HOLDING OFF MOUTH
OCT 08	ASHLULM	2000	FEW		HLCPTR	CLEAR	GOOD	NORMAL	
OCT 14	ASHLULM	6000	LOTS		WALK	CLEAR	GOOD	NORMAL	MOST FISH IN BOTTOM END, TFY 25,000
SEPT 06	DALLERY	300			WALK	CLEAR	GOOD	NORMAL	ONLY LOWER POOLS CHECKED. MOST FISH AT MOUTH.
SEPT 14	DALLERY	2000			HLCPTR	CLEAR	EXCEL	NORMAL	FISH THROUGHOUT
OCT 08	DALLERY	7000	FEW		HLCPTR	CLEAR	GOOD	NORMAL	
OCT 17	DALLERY	4000	700		WALK	CLEAR	EXCL	NORMAL	ALL FISH ABOVE LOWER RAPIDS. TFY 15,000
SEPT 01	GENESEE	250	20		WALK	CLEAR	EXCEL	NORMAL	NO FISH ON SPAWNING BEDS. HOLDING IN POOLS AT MOUTH.
SEPT 10	GENESEE	350	20	100	WALK	CLEAR	EXCEL	NORMAL	MOST FISH IN LOWER POOLS
OCT 03	GENESEE	600			WALK	CLEAR	EXCEL	NORMAL	MOST FISH ACTIVELY SPAWNING
OCT 13	GENESEE	200			WALK	CLEAR	EXCEL	NORMAL	INDUSTRY TOUR. TFY 500
SEPT 07	INZIANA	2500	200		WALK	MUDDY	NIL	ABOVE NORM	RIVER IMPOSSIBLE TO COUNT, FISH THROUGHOUT
SEPT 09	INZIANA	12000	500	20	WALK	GL SILT	GOOD	NORMAL	FISH THROUGHOUT, LOTS OF ACTIVE SPAWNING.
SEPT 15	INZIANA	15000	2000		HLCPTR	CLEAR	EXCEL	NORMAL	GOOD SHOWING OF SPAWNERS BELOW BREAKTHROUGH
SEPT 25	INZIANA	5000			WALK	MUDDY	NIL	FLOOD	FISH THROUGHOUT, VERY POOR COUNTABILITY
OCT 08	INZIANA	500			HLCPTR	CLEAR	GOOD	NORMAL	HEAVY SILTING ON LOWER BAR IN RIVER
OCT 12	INZIANA	2000		0	WALK	CLEAR	GOOD	NORMAL	FISH THROUGHOUT. TFY 30,000

TABLE 3 cont. OWIKENO LAKE 1992 DAILY RECORD OF SOCKEYE ESCAPEMENT SURVEYS

DATE	STREAM	EST. NO. SOCKEYE			METHOD	WATER			COMMENTS
		LIVE	DEAD	%NEW		COND.	VIS.	LEVEL	
SEPT 14	MACHMELL	*****			HLCPTR	MUDDY	FAIR	NORMAL	SOCKEYE OBSERVED IN SIDE CHANNELS, 500 IN CLEAR CREEK
OCT 16	MACHMELL	*****			FLOAT	GL SILT	NIL	NORMAL	4 GILLNET SETS. TOTAL 13 SOCKEYE, 1 JACK, 20 COHO. TFY 5000
SEPT 4	MARBLE	260	30	80	WALK	CLEAR	EXCEL	NORMAL	LESS FISH IN LOWER CHANNEL CLOSE TO THE ROAD
SEPT 04	NEECHANZ	4500			WK/FLT	SILT	FAIR	NORMAL	FISH VISIBLE IN RUNS BUT NOT IN POOLS
SEPT 14	NEECHANZ	7000			HLCPTR	SILT	GOOD	NORMAL	MOST FISH SPAWNING FROM UPPER CORNER POOL DOWN
OCT 07	NEECHANZ	6000			HLCPTR	SILT	FAIR	NORMAL	TFY 30,000
SEPT 15	SHEEMAHANT	30000			HLCPTR	SILT	EXCEL	NORMAL	BULK OF FISH BELOW BRIDGE, NO FISH ABOVE CATARCT.
OCT 08	SHEEMAHANT				HLCPTR	SILT	NIL	NORMAL	VERY POOR SHOWING, LESS THAN LAST INSPECTION
OCT 13	SHEEMAHANT				FLOAT	SILT	NILL	NORMAL	3 SN SETS: #1 8M, 7F, 6 COHO, #2 NO FISH, #3 10 SX, 6 COHO TFY 50,000
SEPT 01	SHMHT FLATS	0	0		PLANE	TEA	GOOD	NORMAL	NO FISH
SEPT 03	SHMHT FLATS	6	0		FLOAT	TEA	GOOD	NORMAL	FISH ALONG THE BEACH.
SEPT 09	SHMHT FLATS	0	0		FLOAT	SILT	GOOD	NORMAL	NO FISH OR JUMPERS.
SEPT 15	SHMHT FLATS	1000			HLCPTR	TEA	EXCEL	EXT. LOW	4 SCHOOLS AT UPPER END OF FLATS. 200 COHO.
OCT 04	SHMHT FLATS	0			FLOAT	TEA	FAIR	NORMAL	NO FISH OR JUMPERS.
SEPT 15	TZEO	3000			HLCPTR	SILT	FAIR	NORMAL	BULK OF FISH SPAWNING DIRECTLY BELOW CATARCT. TFY 5,000
OCT 15	WANNOCK	*****			FLOAT	SILT	POOR	NORMAL	3 BEACH SEIGN SETS. #1 87 SX #2 555 SX #3 652 SX. NO INDICATION OF SCHOOLS FROM JET BOAT. TFY 100,000



TABLE 3 cont. OWIKENO LAKE 1992 - DAILY RECORD OF SOCKEYE ESCAPEMENT SURVEYS.

DATE	STREAM	EST. NO. SOCKEYE			METHOD	WATER			COMMENTS
		LIVE	DEAD	%NEW		COND.	VIS.	LEVEL	
AUG 11	WASHWASH	0	0	0	WALK	CLEAR	FAIR	NORMAL	NO FISH IN RIVER OR HOLDING OUTSIDE RIVER MOUTH.
SEPT 03	WASHWASH	6000	350	50	WALK	SILT	GOOD	NORMAL	FISH WERE OBSERVED IN ALL CHANNELS.
SEPT 11	WASHWASH	***			WALK	SILT	POOR	ABOVE NORM	FISH THROUGHOUT LOWER REACHES, IMPOSSIBLE TO COUNT (HIGH & DIRTY)
SEPT 15	WASHWASH	6000			HLCPTR	CLEAR	EXCEL	NORMAL	VERY FEW FISH HOLDING OFF MOUTH.
SEPT 25	WASHWASH	****			WALK	MUDDY	POOR	ABOVE NORM	FISH OBSERVED IN RIVER, NO COUNT DUE TO HIGH WATER
OCT 04	WASHWASH	4250	200	60	WALK	SILT	FAIR	ABOVE NORM	FISH TROUGHOUT, INCLUDING BREAKTHROUGH & OLD MAINSTEM.
OCT 08	WASHWASH	3000	LOTS	15	WALK	TEA	GOOD	NORMAL	ALSO INSPECTED BY HELICOPTER. TFY 20,000
SEPT 03	WHISKEY CR.	100			FLOAT	SILT	FAIR	NORMAL	MOST SPAWNING AT MOUTH OF CREEK.
SEPT 07	WHISKEY CR.	250	0	80	FLOAT	SILT	GOOD	NORMAL	SPAWNING AT CREEK MOUTH.
OCT 04	WHISKEY CR.	200	0	50	FLOAT	TEA	GOOD	NORMAL	AT CREEK MOUTH AND ALONG LAKE SHORE. TFY 2,500
SEPT 03	3RD NARROWS	0	0		FLOAT	TEA	GOOD	NORMAL	NO FISH.
SEPT 11	3RD NARROWS	60	0	60	FLOAT	TEA	GOOD	NORMAL	FISH AT CREEK MOUTH
OCT 04	3RD NARROWS	300	2	50	FLOAT	SILT	GOOD	NORMAL	MOST FISH AROUND THE CREEK MOUTH.

ABBREVIATIONS: BT = BOAT, CHIN = CHINOOK, COND = CONDITION, DRFT = DRIFT, EXT = EXTREMELY, EXLNT = EXCELLENT, F = FEMALE, GN = GILLNET,  
HLCPTR = HELICOPTER, M = MALE, NORM = NORMAL, PK = PINK, SHMHT = SHEEMAHANT, SN = BEACH SEINE, SX = SOCKEYE, TFY = TOTAL FOR YEAR,  
VIS = VISIBILITY, WISK = WHISKEY

Table 4. Owikeno Lake 1992 daily weather and lake levels.

DATE	LAKE LEVEL (m)		AM WEATHER	PM WEATHER
	AM	PM		
01-Sep	N/A	10.2		Strong W. wind. sunny
02-Sep	10.2	10.2	Overcast/drizzle	Overcast/drizzle
03-Sep	10.1	10.1	Overcast/fog	Overcast/drizzle
04-Sep	10.1	10.0	high cloud/clearing	high cloud
05-Sep	9.9	9.8	overcast	part cloud W wind
06-Sep	9.6	9.5	cloud/drizzle	high cloud/drizzle
07-Sep	9.3	9.9	heavy rain	heavy rain S/W 10-15
08-Sep	10.2	10.1	clear & cold	high cloud/ clear periods
09-Sep	10.1	10.0	clear periods, showers	cl. periods, showers
10-Sep	10.1	10.3	sunny periods	sunny, light N/W
11-Sep	10.4	10.3	high cloud	sunny, strong W. wind
12-Sep	10.2	10.0	overcast, drizzle	heavy rain
13-Sep	9.9	9.8	cloud, drizzle	clearing, sunny periods
14-Sep	9.7	9.4	clear, sunny	clear with some cloud
15-Sep	9.2	8.9	clear, frosty	sunny, warm
16-Sep	8.9	8.7	heavy rain	clear, light W wind
17-Sep	8.6	8.5	high cloud	clear, sunny
18-Sep	8.6	8.4	overcast drizzle	overcast drizzle
19-Sep	8.4	8.5	overcast rain	overcast rain
20-Sep	9.6	10.0	high cloud/sunny	clear/sunny
21-Sep	10.3	10.5	overcast/drizzle	high cloud/sunny
22-Sep	10.6	11.1	sunny breaks	drizzle/heavy rain
23-Sep	11.6	14.4	heavy rain	heavy rain
24-Sep	14.5	14.4	heavy rain	sunny breaks, S/E wind
25-Sep	13.7	13.6	rain	rain
26-Sep	13.6	14.0	heavy rain	sunny breaks
27-Sep	13.7	12.6	high cloud/clearing	high cloud/clear breaks
28-Sep	12.5	12.6	heavy rain	rainy periods
29-Sep	12.8	12.6	high cloud/warm	clear/ warm winds
30-Sep	12.5	12.3	overcast/clear bks.	overcast
01-Oct	12.2	12.1	clear/smoke haze	sunny/smokey
02-Oct	12.0	11.8	drizzle	rain
03-Oct	11.7	11.6	heavy rain	sunny periods
04-Oct	11.2	10.8	high cloud/sun breaks	part cloud/sunny
05-Oct	10.6	10.4	overcast	clear/sunny
06-Oct	10.2	10.0	high cloud	drizzle
07-Oct	9.9	9.7	drizzle	overcast/ rainy periods
08-Oct	9.6	9.5	drizzle/cold	drizzle/cold
09-Oct	9.2	9.0	overcast/rain	overcast, rain
10-Oct	9.0	10.9	overcast/rain	overcast/rainy periods
11-Oct	11.0	11.3	clear periods	clear periods
12-Oct	11.1	11.0	overcast, rain	clear/ sunny
13-Oct	10.7	10.4	clear periods	clear periods/heavy rain
14-Oct	10.1	10.0	clear/cold	sunny/cold
15-Oct	9.8	9.5	clear/heavy frost	clear/cold/sunny
16-Oct	9.3	9.2	overcast/drizzle	overcast/drizzle
17-Oct	9.0	8.9	overcast/drizzle	drizzle/rain
18-Oct	8.9	9.2	heavy rain	heavy rain

## Appendix 1. 1992 Ashlulm River sockeye samples.

Date	Sex	POH	NF	AGE	Date	Sex	POH	NF	AGE
06-Sep-92	M	475	620	52	14-Oct-92	F	515	635	52
06-Sep-92	M	470	620	52	14-Oct-92	F	490	590	52
06-Sep-92	M	530	700	52	14-Oct-92	M	520	670	52
06-Sep-92	F	485	605	52	14-Oct-92	M	505	660	52
06-Sep-92	M	530	720	52	14-Oct-92	M	530	700	52
06-Sep-92	M	510	665	52	14-Oct-92	M	530	700	52
06-Sep-92	M	510	670	52	14-Oct-92	F	540	645	52
06-Sep-92	M	525	690	52	14-Oct-92	F	480	580	52
06-Sep-92	M	500	645	52	14-Oct-92	F	520	625	52
06-Sep-92	M	545	700	52	14-Oct-92	F	480	570	52
14-Oct-92	F	510	620	52	14-Oct-92	F	510	610	52
14-Oct-92	F	435	530	42	14-Oct-92	F	490	585	52
14-Oct-92	F	490	610	52	14-Oct-92	F	510	620	52
14-Oct-92	M	540	720	52	14-Oct-92	F	520	630	52
14-Oct-92	M	505	670	52	15-Oct-92	M	510	650	52
14-Oct-92	M	535	710	52	15-Oct-92	F	485	580	52
14-Oct-92	M	495	660	52	15-Oct-92	F	495	590	52
14-Oct-92	M	480	630	52	15-Oct-92	F	500	590	52
14-Oct-92	M	510	680	52	15-Oct-92	M	445	570	42
14-Oct-92	M	550	720	52	15-Oct-92	M	525	655	52
14-Oct-92	M	495	640	52	15-Oct-92	M	505	645	52
14-Oct-92	M	495	650	52	15-Oct-92	M	515	680	52
14-Oct-92	M	510	650	52	15-Oct-92	M	545	705	52
14-Oct-92	F	530	655	52	15-Oct-92	F	520	620	52
14-Oct-92	F	520	615	52	15-Oct-92	M	535	675	52
14-Oct-92	F	470	550	52	15-Oct-92	M	510	675	52
14-Oct-92	M	375	465	2M	15-Oct-92	M	500	660	52
14-Oct-92	M	390	490	42	15-Oct-92	F	495	605	52
14-Oct-92	M	500	670	52	15-Oct-92	F	495	600	52
14-Oct-92	M	490	625	52	15-Oct-92	F	420	570	52
14-Oct-92	M	520	690	52	15-Oct-92	M	485	635	52
14-Oct-92	M	540	695	52	15-Oct-92	M	510	640	52
14-Oct-92	M	510	680	52	15-Oct-92	M	430	570	42
14-Oct-92	M	545	710	52	15-Oct-92	M	545	680	52
14-Oct-92	M	500	655	52	15-Oct-92	M	490	625	52
14-Oct-92	F	495	615	52	15-Oct-92	M	520	680	52
14-Oct-92	F	480	585	52	15-Oct-92	F	460	570	52
14-Oct-92	F	510	610	52	15-Oct-92	F	525	620	52
14-Oct-92	F	480	590	52	15-Oct-92	F	520	605	52
14-Oct-92	F	510	620	52	15-Oct-92	F	490	580	52
14-Oct-92	F	500	605	52	15-Oct-92	M	535	710	52
14-Oct-92	M	420	540	2M	15-Oct-92	M	545	670	52
14-Oct-92	M	525	675	52	15-Oct-92	F	485	595	52
14-Oct-92	M	490	625	52	15-Oct-92	F	500	610	52
14-Oct-92	M	520	700	52	15-Oct-92	F	510	620	52
14-Oct-92	M	490	630	52	15-Oct-92	F	470	575	52
14-Oct-92	F	420	515	42	15-Oct-92	F	500	590	52
14-Oct-92	F	520	635	52	15-Oct-92	F	510	600	52
14-Oct-92	F	475	585	52	15-Oct-92	F	505	620	52
14-Oct-92	F	520	620	52	15-Oct-92	F	525	620	52

## Appendix 2. 1992 Inziana River sockeye samples.

Date	Sex	POH	NF	AGE	Date	Sex	POH	NF	AGE
07-Sep-92	M	500	650	52	09-Sep-92	M	530	675	52
07-Sep-92	M	530	690	63	09-Sep-92	F	485	585	52
07-Sep-92	F	500	590	52	09-Sep-92	M	530	680	52
07-Sep-92	F	515	620	52	09-Sep-92	F	500	615	52
07-Sep-92	M	500	650	52	09-Sep-92	M	515	645	52
07-Sep-92	F	475	585		09-Sep-92	F	515	635	52
07-Sep-92	M	560	725	52	09-Sep-92	F	450	545	52
07-Sep-92	F	540	650	52	09-Sep-92	M	485	650	52
07-Sep-92	M	515	660	52	09-Sep-92	M	465	610	52
07-Sep-92	M	515	705	52	09-Sep-92	F	475	580	52
07-Sep-92	F	510	630	52	09-Sep-92	M	530	680	52
07-Sep-92	M	510	680	52	09-Sep-92	M	520	680	52
07-Sep-92	M	500	650	52	09-Sep-92	M	525	655	52
07-Sep-92	M	580	730	52	09-Sep-92	M	530	660	52
07-Sep-92	F	540	635	52	09-Sep-92	F	485	580	52
07-Sep-92	F	510	600	63	09-Sep-92	F	480	570	52
07-Sep-92	M	545	700	52	09-Sep-92	F	440	555	52
07-Sep-92	F	520	635	52	09-Sep-92	F	480	560	52
07-Sep-92	M	540	700	63	09-Sep-92	F	515	645	52
07-Sep-92	F	530	655	52	09-Sep-92	F	500	605	52
07-Sep-92	F	500	610	52	29-Sep-92	M	535	710	52
07-Sep-92	M	510	655	52	29-Sep-92	F	510	625	52
07-Sep-92	M	555	695	52	29-Sep-92	M	500	670	52
07-Sep-92	M	540	700	52	29-Sep-92	F	525	645	52
07-Sep-92	M	525	690	52	29-Sep-92	M	480	640	52
07-Sep-92	F	530	650	52	29-Sep-92	M	540	720	52
07-Sep-92	M	530	675	52	29-Sep-92	F	515	650	52
07-Sep-92	M	510	650	52	29-Sep-92	F	505	620	52
07-Sep-92	M	400	510	42	29-Sep-92	M	560	715	52
07-Sep-92	M	520	680	52	29-Sep-92	F	515	645	52
07-Sep-92	F	510	620	52	29-Sep-92	M	545	700	52
07-Sep-92	M	570	725	52	29-Sep-92	M	520	675	52
07-Sep-92	M	530	680	52	29-Sep-92	M	530	700	52
07-Sep-92	M	545	700	52	29-Sep-92	F	525	645	52
07-Sep-92	F	520	630	52	29-Sep-92	F	455	575	52
07-Sep-92	F	505	610	52	29-Sep-92	F	495	615	52
07-Sep-92	F	490	610	52	29-Sep-92	M	530	705	52
07-Sep-92	M	560	710	52	29-Sep-92	M	495	650	52
07-Sep-92	M	520	660	52	29-Sep-92	F	530	660	52
07-Sep-92	M	540	670	52	29-Sep-92	F	515	630	52
07-Sep-92	M	500	650	52	29-Sep-92	F	460	595	52
07-Sep-92	M	535	695	52	29-Sep-92	M	540	730	52
07-Sep-92	M	550	720	52	29-Sep-92	M	485	660	52
07-Sep-92	M	550	715	63	29-Sep-92	M	520	690	52
07-Sep-92	M	515	665	52	29-Sep-92	M	515	665	52
07-Sep-92	F	530	640	52	29-Sep-92	F	505	620	52
07-Sep-92	M	550	695	52	29-Sep-92	F	495	640	52
07-Sep-92	M	495	635		29-Sep-92	F	510	640	52
07-Sep-92	F	520	620		29-Sep-92	M	525	705	52
07-Sep-92	F	520	630	52	29-Sep-92	M	530	695	52

## Appendix 3. 1992 Washwash River sockeye samples.

Date	Sex	POH	NF	AGE	Date	Sex	POH	NF	AGE
03-Sep-92	M	530	715	52	04-Oct-92	F	480	590	52
03-Sep-92	M	560	700	52	04-Oct-92	M	555	740	52
03-Sep-92	F	505	615	52	04-Oct-92	F	495	565	52
03-Sep-92	M	500	640	52	04-Oct-92	F	440	535	52
03-Sep-92	M	495	635	52	04-Oct-92	F	490	600	52
03-Sep-92	M	515	680	52	04-Oct-92	F	510	615	52
03-Sep-92	M	520	670	52	04-Oct-92	F	490	610	52
03-Sep-92	M	560	725	52	04-Oct-92	M	530	705	52
03-Sep-92	M	545	690	52	04-Oct-92	M	510	660	
03-Sep-92	M	510	690	52	04-Oct-92	F	455	560	52
03-Sep-92	M	510	660	52	04-Oct-92	F	505	620	63
03-Sep-92	M	530	700	52	04-Oct-92	F	510	615	52
03-Sep-92	M	580	760	52	04-Oct-92	F	475	575	64
03-Sep-92	M	505	635	52	04-Oct-92	F	500	630	52
03-Sep-92	F	510	610	52	04-Oct-92	M	495	660	52
03-Sep-92	M	505	660	52	04-Oct-92	F	480	600	63
03-Sep-92	M	520	685	41	04-Oct-92	F	525	635	52
03-Sep-92	M	520	675	52	04-Oct-92	F	525	645	52
03-Sep-92	F	540	640	52	04-Oct-92	F	495	585	52
03-Sep-92	M	515	640	52	04-Oct-92	F	515	620	52
03-Sep-92	M	515	670	52	04-Oct-92	M	560	730	52
03-Sep-92	M	620	690	52	04-Oct-92	F	505	620	52
09-Sep-92	F	530	680	63	04-Oct-92	M	485	665	52
09-Sep-92	M	485	585	52	04-Oct-92	F	515	655	52
09-Sep-92	F	510	670	52	04-Oct-92	F	460	570	52
09-Sep-92	M	480	565	52	04-Oct-92	F	495	610	52
09-Sep-92	M	485	635	52	04-Oct-92	F	510	620	52
09-Sep-92	M	520	655	52	04-Oct-92	M	530	700	63
09-Sep-92	M	520	675	52	04-Oct-92	M	535	730	52
09-Sep-92	M	500	645	63	04-Oct-92	F	450	570	52
09-Sep-92	F	500	640	52	04-Oct-92	F	485	610	52
09-Sep-92	F	515	625	52	04-Oct-92	F	485	620	52
04-Oct-92	F	480	580	52	04-Oct-92	M	565	765	63
04-Oct-92	F	490	580	52	04-Oct-92	M	530	725	52
04-Oct-92	F	510	620	52	04-Oct-92	F	455	580	52
04-Oct-92	F	500	595	52	04-Oct-92	F	520	640	52
04-Oct-92	M	520	685	52	04-Oct-92	F	465	580	52
04-Oct-92	F	500	610	52	12-Oct-92	F	485	610	63
04-Oct-92	F	495	590	52	12-Oct-92	F	520	645	63
04-Oct-92	F	500	625	52	12-Oct-92	F	450	545	42
04-Oct-92	F	510	640	63	12-Oct-92	F	485	595	52
04-Oct-92	F	490	600	52	12-Oct-92	F	490	600	41
04-Oct-92	F	500	615	52	12-Oct-92	F	475	600	63
04-Oct-92	F	500	635	63	12-Oct-92	F	490	595	52
04-Oct-92	F	475	580	52	12-Oct-92	F	485	575	52
04-Oct-92	F	460	575	52	12-Oct-92	F	490	580	63
04-Oct-92	F	520	650	52	12-Oct-92	F	455	545	63
04-Oct-92	F	410	510	52					

## Appendix 4. 1992 Neechanz River sockeye samples.

Date	Sex	POH	NF	AGE	Date	Sex	POH	NF	AGE
11-Oct-92	M	495	650	52	11-Oct-92	F	510	620	52
11-Oct-92	M	535	700	52	11-Oct-92	F	490	605	52
11-Oct-92	M	395	500	42	11-Oct-92	F	480	570	52
11-Oct-92	M	380	475	42	11-Oct-92	F	510	620	52

## Appendix 5. 1992 Wannock River sockeye samples.

Date	Sex	POH	NF	AGE	Date	Sex	POH	NF	AGE
16-Oct-92	M	380	475	42	16-Oct-92	M	445	555	52
16-Oct-92	M	310	370	42	16-Oct-92	M	375	450	42
16-Oct-92	F	455	560	52	16-Oct-92	F	390	480	42
16-Oct-92	M	410	520	53	16-Oct-92	M	460	565	52
16-Oct-92	F	450	565	52	16-Oct-92	F	475	570	52
16-Oct-92	F	445	545	52	16-Oct-92	M	460	580	52
16-Oct-92	F	440	545	63	16-Oct-92	M	365	440	52
16-Oct-92	M	450	565	52	16-Oct-92	F	470	580	41
16-Oct-92	M	430	560	52	16-Oct-92	F	405	485	52
16-Oct-92	F	400	485	53	16-Oct-92	M	485	585	52
16-Oct-92	M	380	475	42	16-Oct-92	M	585	475	52
16-Oct-92	M	280	355	32	16-Oct-92	M	475	560	52
16-Oct-92	M	375	470	31	16-Oct-92	M	430	540	52
16-Oct-92	F	480	580	3M	16-Oct-92	M	405	510	42
16-Oct-92	F	470	560	52	16-Oct-92	F	495	595	52
16-Oct-92	F	455	560	52	16-Oct-92	M	410	505	53
16-Oct-92	F	465	555	52	16-Oct-92	M	400	500	53
16-Oct-92	F	450	585	52	16-Oct-92	M	475	580	52
16-Oct-92	F	445	550	52	16-Oct-92	F	400	495	31
16-Oct-92	F	420	505	52	16-Oct-92	M	405	510	42
16-Oct-92	M	305	375	42	16-Oct-92	F	465	570	52
16-Oct-92	F	450	550	52	16-Oct-92	M	425	515	42
16-Oct-92	M	470	575	52	16-Oct-92	M	395	470	42
16-Oct-92	M	420	510	42					