COLVILLE RIVER HELMERICKS WINTER FISHERY 2001

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An Overview of the Helmericks Fishery 2001 Season

Freeze-up Conditions

Our lake froze on the 29th of September and there was enough ice across places on the river that boat travel was essentially ended at this time. The official freeze-up date for the river came a few days later on October 1st, which was about a week later than freeze-up recorded for the previous two years. With little precipitation in the mountains, and light winds just before freeze-up, the river was low and fairly fresh even near the bottom at freeze-up. After the first week of October a low salinity layer developed in the top 3 meters and remained into late November. In the past ten years only 1995 and 1999 have had a close similarity in water chemistry. In 1995 the water remained fresh until the end of October, then developed a salinity layer in the bottom 2 meters that was twice as brackish as this 2001 season, while maintaining a fresh layer in the top 3 meters. In 1999 the river remained basically fresh water with a salinity of less than 1 ppt into January, 2000.

This year there were no large concentrations of Glaucous gulls in the delta at freeze-up, and a group of 250 red-breasted mergansers were only around for two days. Perhaps this was an indication of low numbers of small ciscos in the area at the time.

A new season starts

Fishing Effort and Methods

This year's fishing methods and location remained the same as in past years, and while the fishing effort was down from the ten year average, it was an increase of 48% over last year. I set the first nets of the season, two 3" mesh nets on the 8th of October when the ice was three inches thick at our Char Island fishing location. This was two days earlier than in 2000, and about the average for the past ten years. A 3 ¼" mesh net was set on October 11th and the last net, a 3" mesh

was set on the 15th . The larger mesh net was fished until the 27th of October when it was pulled to help from going over our quota of hump-back whitefish, even though it was still catching equal numbers of arctic cisco. The 3" nets were fished until the 20th of November when they were pulled for the season. This gave us a total of 138 net days of fishing, and data collected over a seven week period. While this year's effort was up over last year, it was still 43% below the ten year average.

Nets are normally checked each week day except Sunday, which is set aside to get caught up on other chores. We switch to picking nets every other day when the fish run slows down, like it does towards the end of the season. Longer sets than two days are usually caused by storms or high temperatures, when the fish are better off left in the cold water than lying on the ice and not freezing. Catch data was recorded for each net by species and net location. Fishing effort is calculated in net days by using the date a net is set, then pulled.

Figure 01

Date	Oct. 8	Oct.11	Oct. 15	Oct. 27	Nov. 20
Net #1	3"				3"
Net #2	3"				3"
Net #3		3 ¼"		3¼"	
Net #4			3"		3"
Action Taken	Set	Set	Set	Pulled	Pulled

Net Activity

Collection Methods

This year all tagged fish and a small sample of arctic cisco were collected for laboratory analysis. Besides the usual weight and length measurements, otoliths were also collected from the arctic cisco. On the laboratory reports the condition and names of the fish are indicated by the following notations:

ARCS - arctic cisco **LSCS** - least cisco **BDWF** - broad whitefish
BRCS - bering cisco **GRAY**-grayling **HBWF** - humpback whitefish
TND - total net days **CPUE** - catch per unit effort **PPT** - parts per thousand
SO - indicates a spawned out individual
M - a mature fish
M1 - may not spawn the following season
M2 - most likely to spawn the following season
Fat 0-5 - amount of body-cavity fat rated on a scale of 0-5,with 0 being the lowest, or none
Stomach fullness - indicates the amount of retained food
FL - fork length measurement

Daily catch data was recorded for each net as to species and number. The nets were picked every day (except Sunday), for the first two weeks then they were picked about every other day for the rest of the season. CPUE is based on a net size of 50 meters in length by 2 meters deep, and a soak time of 24 hours. The fork length was recorded to the nearest millimeter on the dissection sheets and to the nearest centimeter on the weekly charts. Fish weights were recorded to the nearest gram. Every week fifty arctic cisco were collected midweek for length frequencies from the 3" mesh nets. We collected 7 weekly samples from the 3-inch nets, but only two for the 3¼" net due to the shorter time used. I tried to collect weekly samples on Tuesday this year, but because of the picking schedule change into the third week, about half were collected on Wednesday. Also for a couple weeks sample size was too small on the previous day and so a second day was needed to get a standard sample size. Least cisco and humpback whitefish were sampled four times during the fall for length frequencies. No broad whitefish were sampled this year.

A YSI Model 30 conductive meter was used to record the water temperature and salinity at the Char Island set on the East Channel throughout the fishing season. Water temperature was recorded in degrees Celsius and the salinity in parts per thousand (PPT). Measurements were taken every .5 meter in the water column, starting from the surface and extending to the bottom.

Tag Return Information

The tag catch remained low, and continued to decline The total tag returns for the 2001 season was only 10 floy tags. There has been no tagged arctic cisco for several years now, and the few collected tags were all least cisco, most from LGL's tagging done in the early 1990's, except for one 2001 tag from MJM. A break down of all the tags is shown in Figure 3, and the dissection data in Table 12.

Catch Totals and Monthly Catch Per Unit Effort

138 Total Net Days Fished in the 2001 Season

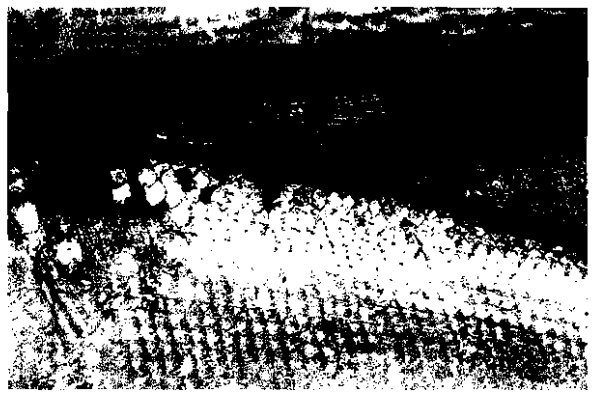
Figure 02

Month	ARCS	CPUE	LSCS	CPUE	HBWH	CPUE
October	1505	19.3	2601	33.3	4729	60.6
November	419	7.0	375	6.3	1455	24.3
December	0	0	0	0	0	0
Totals	**1924**	**13.9**	**2976**	**21.6**	**6184**	**44.8**

2001 Floy Tag Recovery By Company and Species

Figure 03

Company	LSCS	ARCS	HBWH	BDWF	Total
ARCO85	00	00	00	00	**00**
ENVIRO	00	00	00	00	**00**
LGL82	00	00	00	00	**00**
LGL-blue	00	00	00	00	**00**
LGL90	01	00	00	00	**01**
LGL91	03	00	00	00	**03**
LGL92	02	00	00	00	**02**
LGL93	03	00	00	00	**03**
WCC82	00	00	00	00	**00**
MJM-01	01	00	00	00	**01**
Species	**10**	**00**	**00**	**00**	**10**



Tagged least cisco MJM-01

Weather and Salinity Conditions

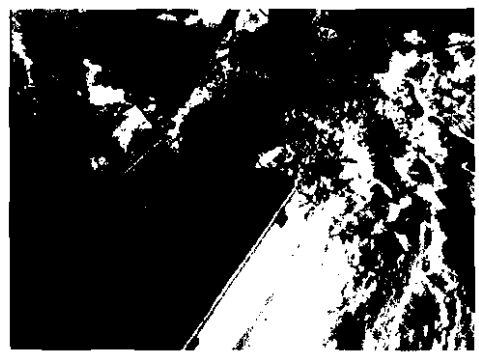
Salinity and temperature profile measurements were taken every day during the fishing season using a YSI model s-c-t meter. Readings were also taken twice before the fishing season started, and once afterwards to check on what the river salinity was doing. Readings were taken every .5 meter, starting at the surface of the water and continuing until the bottom was reached at around five meters. The salinity was recorded in parts per thousand (PPT), and the water temperature in degrees Celsius. The water data was collected at the Char Island Station from the 4th of October to the 20th of November, then again on December 1st.

Just prior to and during the fall fishing season the winds were light so only two minor flooding episodes were observed in the first part of fall fishing, and in our area they were only near the ocean front. October winds from the south to west direction accounted for only 22.5% of the winds, while the majority were out of the northwest to north (58%). The highest salinity was recorded at the start of fishing when it was 16 ppt on the bottom, but basically it remained quite stable throughout the season. After the middle of the of October salinity remained about 8 ppt until the end of fishing. The fresh layer in the top three meters remained at less than 1 ppt throughout most of the season, with the three meter level only dropping below 1ppt after the 9th of November.

All of the fall storms were from the north or north-northeast and none lasted more than two and a half days. Only one storm in the early morning of the 12th October had winds over 25 knots, and this had little effect on the river salinity. Predominate NW to NNE winds in October, coming off the sea ice to land, brought many snowy days and we received over eighteen inches of snow for that month. This is the most snow in October we have had in over six years.

Tables 1A-1C show the daily salinity and water temperatures for the Char Island Station. Chart 1 shows the salinity measurements graphed out at each meter level. Chart 2 shows the salinity averages for the years 1995-2001, Chart 3 shows the low salinity years between 1992 and 2001. Chart 5 shows the daily catch totals by species in relation to average salinity levels for 2001. Weather recorded on each fishing day and fall storms* are shown in Table 2.

* To be classed as a storm a wind at or above 20 knots is used.



Water Reading

Arctic Cisco (Coregonus autumnalis)

The arctic cisco catch for the 138 net days of fishing this year was 1,924 (960 kg), which resulted in a catch per net day (CPUE) of 13.9 for the season. This is the lowest CPUE that we have had since 1985 and represents a decline of 79% from the last 10 year mean of 66.8 CPUE. The catch total is also the lowest for the fishery ever, a 27% decline from last year's catch, and a whopping 87% decline from the 10 year average of 14,594 fish. The total net days fished this year is up 48% over 2000, but still down 43% when compared to the 10 year mean of 242 net days. The daily catch totals are shown Table 3.

Arctic cisco

As anticipated from the data collected in 2000, the arctic cisco catch continued to decline. While total numbers were down, fish size (measured in fork length) was up again for another year, breaking last years record of 35.2cm by .5cm. This is an increase to 35.7cm, another record for the 3" nets. With the larger fish being caught, the average weight for the season was a robust 0.50kg per fish or a biomass total of 960kg for the arctic cisco catch this year. The ≤32cm length percentages made a slight increase over last year, increasing to 0.17% of the total catch. Last year it was only 0.086%, so a few younger fish have appeared, but it still looks like it will take more than this coming year to get back above 40% and a decent catch. In the past a ratio of between 50-60% of the population being in the ≤32cm range indicated strong 5-6 year age class in the system. (See Table 7 for ARCS population size in respect to≤32cm). After getting several spawned out arctic cisco last year, only one was collected this year. A small number (less than 2%) of arctic cisco were seen that looked spawned out, and five were collected . While all these were under weight, only one was a positive spawner. This is a lot less than last year when compared to the estimated 10% that were possible Colville spawners, and this indicates breeding is still very sporadic in the Colville at this time. The population as a whole was in good health and most of the ARCS dissected had a medium amount of body cavity fat.

Changes in arctic cisco sizes from one week to the next between the two net sizes was more pronounced then usual this year. The weekly measurements from the three-inch nets (Table 8) showed that the population had a size fluctuation of 1.32cm for the season. We caught the smallest sized fish during the second and fourth weeks, and our smallest average of the season was only 34.76cm, caught in the second week. Fish continued to increase in size, with weeks six and seven having the largest weekly average at 36.1cm. The 3¼" net had an average fork length of 37.46cm (Table 9), and a rather large difference of 1.16cm between the first two weeks when samples were taken. Also there was a 1.8cm difference between the 3" net at 35.7cm, another indicator of how skewed the population is towards fish over 7 years old. October's average CPUE of 19.3 was about triple of November's 7.0, and also had a lot more variation in the daily catch, ranging from a high of 92 in the first week to a low of 3.3 CPUE at the end of the month. November had fewer fish for the whole month with single digit CPUE for most of the month with a spike up to 24 on the 17th then back down to 5.2 to end the season.

The dark-finned arctic cisco made a larger percentage of the run this year compared to past years. They averaged about 30% of the yearly take, with daily variations as high as 40% of the catch.

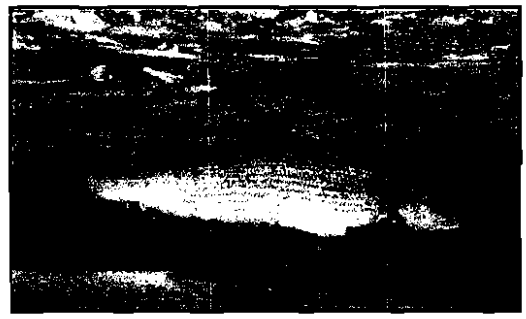
Bering cisco (Coregonus luarettae)

Bering cisco continue to remain low after their peak in 1990, with only two taken in October again this year. The one that was sampled was a mature male 343mm in length and weighing 486 grams. It had some of the classic black metallic spots and white dots outlined in pink on the body.

Least Cisco (Coregonus sardinella)

The poor showing for least cisco this fall was the main unexpected event. After a few lean years in the early 90's it looked like the least cisco were doing all right. While 2000 total catch was down due to low net days, the CPUE continued high where it had been for the past five years. So this year's catch of only 2,976 (922.6kg) least cisco was a surprise, and the lowest catch total in 34 years. This year's CPUE of 21.6 is a drop of 65% over last year and a 46% drop over the 10 year mean. The catch total of 2,976 is a decline of 62% over the 10 year mean of 7,934. The daily catch by net are shown in Table 4, and daily catch (all species) is graphed with salinity readings in Chart 3.

All indicators were present for the fishery to have a good catch of least cisco this year: low salinity levels, large numbers in 2000, and little feeding pressure from competing arctic cisco. The season started out with good numbers, but they declined rapidly, going from a high of 94 CPUE to 16 CPUE at the end of October. The CPUE average for October was 33, but dropped to only 6.3 for the month of November.



Least cisco

Fork length samples were collected four times, starting on October 9th, over the course of the fall fishing season to assess population size. The weekly sample lengths varied between 31.4cm on 9 October to 32.8 on 9 November. This spread of 1.4cm was .8cm greater than last year, and the yearly average also increased for another year to 32.01cm. This is an increase of .3cm over 2000, and is the first time the population has averaged over 32cm since 1991, which was also a low population year. While this year's growth is slightly smaller than last year, the growth curve continues to increase since the low of 30.75cm in 1997. Weekly fork length measurements are listed in Table 10, and yearly length size from 1985 to 2001 are graphed in Chart 4.

All the tagged fish caught this year were least cisco, and tag data and dissection information are listed in Table 12, and Figure 3. As expected the total tag return continues to remain low, although MJM Research did apply a few new tags this year. Most of the tags came from the LGL tagging operations from 1993 and earlier, although we did get one of the 2001 MJM tags. Of the 10 tagged fish caught, 6 were mature non-spawning females, 3 were spawned-out females, and 1 was a spawned out male. The non-spawning females were in good shape and body cavity fat values

between .5 and 4.5 (5.0 max), and at an average weight of 0.31kg. The total biomass for the least cisco catch this year is 922.6kg.

Humpback Whitefish (Coregonus pidschian)

The humpback whitefish run had another strong year with a catch of 6184 (3030.2kg) for the season. The catch was a 66% increase over 2000 and 11% over the 10 year mean of 5590 whitefish (Table 14). The run was strong all fall, but catch rates were higher during October when we were still running the larger mesh net. That net was pulled early to keep from catching more than our quota allowed. The season CPUE of 44.8 was 13% increase over 2000 and 64% above the 10 year mean CPUE of 27.3. All segments of the population were present, most non-spawners were in good health, and all were feeding throughout the fall. The 2001 daily catch by net is shown in Table 5, yearly fish totals in Table 6, and population size measurements in Table 11.

Weekly fork length measurements were taken four times during the fall and ranged from 35.1cm to 37cm with a yearly average of 35.9cm. The two largest samples were taken in October, with the size dropping about one centimeter in November. This is 0.3cm less than the average for 2000.

Summery

With the arctic cisco run down even more this year, we were not able to supply both the Arctic Coast market as well as the Fairbanks one. Moreover, with the poor catch of least cisco, we would have been unable to even meet the Fairbanks market, save for the good run of hump-back whitefish. In the life history of our commercial fishery , a span of fifty years, this is the first time that the total whitefish catch exceeded both the arctic and least cisco catches combined. The large size and thus good poundage of the few arctic cisco we did catch helped somewhat to make up for that dismal aspect of our fishery.

Data collected for 2001 indicates that 2002 might be another lean year, especially if the least cisco numbers also remain low. The hump-back whitefish population seems to remain healthy and produce good numbers, which will help keep the commercial fishery going.

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What its all about

COMMERCIAL FISHERY SUPPORTING DATA

APPENDIX LISTING

LIST OF APPENDIX TABLES and CHARTS

Table 1A

Char Island - East Channel - Salinity Data 2001

Meters	04-Oct	08-Oct	09-Oct	10-Oct	11-Oct	12-Oct	13-Oct	15-Oct	16-Oct	17-Oct	18-Oct	19-Oct
0.5	0.1	0.3	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.3	0.3	0.2
1.0	0.1	0.3	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.3	0.3	0.2
1.5	0.1	0.3	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.3	0.3	0.2
2.0	0.1	0.4	0.2	0.2	0.3	0.2	0.3	0.2	0.3	0.4	0.3	0.2
2.5	0.2	0.6	0.2	0.2	0.3	0.2	0.3	0.3	0.3	0.4	0.3	0.2
3.0	0.3	1.0	0.3	0.3	0.5	0.3	0.3	0.3	0.3	0.5	0.3	0.2
3.5	0.3	4.2	1.8	1.0	0.9	1.9	1.8	12.4	9.9	1.2	0.6	2.8
4.0	0.4	10.6	12.4	13.8	10.6	9.0	7.6	13.7	11.9	10.6	11.7	8.8
4.5	0.4	12.3	13.0	16.0	11.6	10.1	8.0	13.9	13.8	13.1	12.5	9.3
5.0	0.4	12.5										
5.5												

Salinity Recored in Parts Per Thousand

0.5-2.0	0.1	0.3	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.3	0.3	0.2
2.5-5.0	0.3	6.9	5.5	6.3	4.8	4.3	3.6	8.1	7.2	5.2	5.1	4.3
0.5-5.0	0.2	4.3	3.2	3.6	2.8	2.5	2.1	4.6	4.2	3.0	3.0	2.5

Water Temperature Data

0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
3.0	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
4.0	0.2	0.2	0.2	0.3	0.2	0.2	0.3	0.4	0.4	0.3	0.4	0.3
5.0	0.2	0.2	0.3	0.3	0.2	0.2	0.3	0.4	0.3	0.4	0.5	0.3

Temperature in Degrees Celsius

0.0-5.0	0.2	0.1	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2

Table 1B

Char Island - East Channel - Salinity Data 2001

Meters	20-Oct	22-Oct	24-Oct	25-Oct	26-Oct	27-Oct	29-Oct	31-Oct	02-Nov	03-Nov	05-Nov	07-Nov
0.5	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.2	0.2	0.2		0.1
1.0	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.2	0.2	0.2		0.1
1.5	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.2	0.2	0.2		0.1
2.0	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.2	0.2	0.2		0.2
2.5	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2		0.2
3.0	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2		0.6
3.5	1.6	0.8	1.3	0.5	3.6	1.3	0.2	0.3	2.7	4.9		1.9
4.0	1.9	10	10.1	6.8	8.4	10.1	8.5	7.4	8.4	8.3		5.5
4.5	2.1	12.3	11.5	7.1	10.2	11.5	11.1	11.0	9.2	9.2		8.8
5.0												
5.5												

Salinity Recored in Parts Per Thousand

0.5-2.0	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.2	0.2	0.2	ERR	0.1
2.5-5.0	1.2	4.7	4.7	3.0	4.5	4.7	4.0	3.8	4.2	4.6	ERR	3.4
0.5-5.0	0.8	2.7	2.7	1.7	2.6	2.7	2.3	2.2	2.4	2.6	ERR	1.9

Water Temperature Data

0.0	0.2	0.2	0.0	0.1	0.0	0.1	0.1	0.2	0.1	0.0		0
1.0	0.2	0.2	0.0	0.1	0.0	0.1	0.1	0.2	0.1	0.0		0
2.0	0.2	0.2	0.0	0.1	-0.1	0.0	0.1	0.2	0.1	0.0		0
3.0	0.2	0.2	0.0	0.1	-0.1	0.0	0.1	0.2	0.1	0.0		-0.1
4.0	0.3	0.5	0.4	0.3	0.2	0.3	0.3	0.4	0.3	0.3		0.2
5.0	0.4	0.6	0.4	0.3	0.4	0.4	0.5	0.6	0.5	0.4		0.3

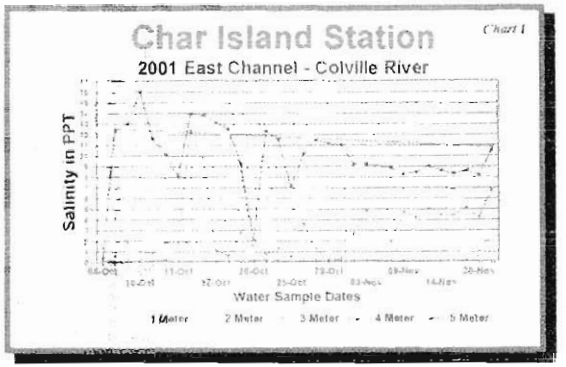
Temperature in Degrees Celsius

0.0-5.0	0.3	0.3	0.1	0.2	0.1	0.2	0.2	0.3	0.2	0.1	ERR	0.1

Table 1C

Char Island - East Channel - Salinity Data 2001

Meters	09-Nov	10-Nov	12-Nov	14-Nov	16-Nov	17-Nov	20-Nov	01-Dec	01-Jan-02
0.5	0.2	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.4
1.0	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.4
1.5	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.4
2.0	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	2.5
2.5	0.2	0.1	0.1	0.1	0.2	0.2	0.5	3	9.1
3.0	0.4	2.0	1.8	1.8	1.1	2.0	2.2	4.9	13.2
3.5	4.7	4.2	5.0	4.4	4.4	5.1	4.2	6.8	14.8
4.0	6.1	6.2	8.6	7.7	7.6	7.6	6.6	8.3	15.3
4.5	8.3	8.4	9.0	8.6	8.3	8.6	8.2	10.5	15.5
5.0								10.8	
5.5									



Salinity Recored in Parts Per Thousand

0.5-2.0	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.9
2.5-5.0	3.9	4.2	4.9	4.5	4.3	4.7	4.3	7.4	13.6
0.5-5.0	2.3	2.4	2.8	2.6	2.5	2.7	2.5	4.5	8.0

Water Temperature Data

0.0	0.1	0	0.1	0.1	0.1	0.1	0.0	0	0.1
1.0	0.1	0	0.1	0.1	0.1	0.1	0.1	0	0.1
2.0	0.1	0	0	0.1	0.1	0.1	0.1	-0.1	0
3.0	0.1	0.1	0.1	0.2	0.2	0.1	0.0	0	-0.2
4.0	0.2	0.2	0.3	0.4	0.4	0.4	0.2	0.2	-0.1
5.0	0.4	0.4	0.5	0.5	0.5	0.5	0.4	0.2	-0.1

Temperature in Degrees Celsius

0.0-5.0	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.1	-0.0

Weather During Fishing Season

Colville Village

Table 02

Recorded on Sampling Day

08-Oct-01	1125hr	Brok 16degF Vis 05 lt snow	N	07 kts
09-Oct-01	1130hr	Ovc 15degF Vis 02 snow,drft sn	NNE	15 kts
10-Oct-01	1445hr	Ovc 14 degF Vis 02 snow, drifting sn	N	20 kts
11-Oct-01	1524hr	Ovc 20degF Vis 01 snow,drft sn	NNE	18-25 kts
12-Oct-01	1425hr	Ovc 25degF Vis 05 mist	N	08 kts
13-Oct-01	1250hr	Brok -1 degF Vis 20	SE	05 kts
15-Oct-01	1215hr	Ovc 16degF Vis 03 snow	S	04 kts
16-Oct-01	1225hr	Ovc 16degF Vis 03 snow	N	04 kts
17-Oct-01	1255hr	Ovc 12degF Vis 01 snow, drft sn	N	18 kts
18-Oct-01	1305hr	Ovc 10degF Vis 02 snow, drft sn	N	16 kts
19-Oct-01	1200hr	Scat 02degF Vis 10	N	10 kts
20-Oct-01	1330hr	Brok 05degF Vis 1.5 Drifting snow, mist	N	16 kts
22-Oct-01	1600hr	Ovc 06 degF Vis 04 lt. snow, mist, drft sn	N	14 kts
24-Oct-01	1315hr	Ovc 04 degF Vis 03 lt. snow, mist	NW	10 kts
25-Oct-01	1450hr	Ovc -3 degF Vis 02 mist	SW	03 kts
26-Oct-01	1300hr	Ovc -2degF Vis 05 lt. snow	S	07 kts
27-Oct-01	1350hr	Brok -6degF Vis 20	N	04 kts
29-Oct-01	1330hr	Ovc 08degF Vis 1.5 lt. snow, mist, drft sn	NNE	15-20 kts
31-Oct-01	1300hr	Brok 0 degF Vis 10	S	10 kts
02-Nov-01	1300hr	Ovc 06degF Vis 05 lt. snow, drft sn	SSW	10 kts
03-Nov-01	1215hr	Ovc 06degF Vis 05 lt. snow	W	08 kts
05-Nov-01	1230hr	Ovc 02 degF Vis 07 lt. snow	E	09 kts
07-Nov-01	1225hr	Brok -4 degF Vis 10	SSW	08 kts
09-Nov-01	1150hr	Ovc -2 degF Vis 05 lt. snow, drifting sn	NE	12 kts
10-Nov-01	1400hr	Brok -4 degF Vis 05 mist, drifting sn	E	8-12 kts
12-Nov-01	1130hr	Ovc 04 degF Vis 08 lt. snow	NE	06 kts
14-Nov-01	1305hr	Ovc 02 degF Vis 04 lt. snow	NE	04 kts
16-Nov-01	1215hr	Brok -6 degF Vis 15	S	08 kts
17-Nov-01	1430hr	Brok -4 degF Vis 10	S	05 kts
20-Nov-01	1200hr	Ovc 11 degF Vis 01 snow	NW	05 kts

Fall Storm Winds ≥ 20 Knots

10-Oct	N 20 kts	11/09 NNE 17-23 kts late evening
11-Oct	NNE 18-25 kts	
12-Oct	N 25 Pk Gust 33 kts early AM	
29-Oct	N 20-25 kts evening	

ARCTIC CISCO

2001

Table 03

Daily Fish Catch by Net - East Channel CRD - October - November

DATE	Net # 1 3" Mesh	Net # 2 3" Mesh	Net # 3 3 1/4 " Mesh	Net # 4 3" Mesh	Net # 5 3" Mesh	Net # 6 3" Mesh	Day Total
09-Oct	92	92					184
10-Oct	68	47					115
11-Oct	33	56					89
12-Oct	74	84	66				224
13-Oct	27	62	42				131
14-Oct							0
15-Oct	49	56	53				158
16-Oct	19	24	42	17			102
17-Oct	22	28	37	20			107
18-Oct	11	18	27	7			63
19-Oct	5	9	9				23
20-Oct	14	11	11	11			47
21-Oct							0
22-Oct	12	13	20	9			54
23-Oct							0
24-Oct	5	10	17	12			44
25-Oct	8	12					20
26-Oct			13	19			32
27-Oct	10	10	21	7			48
28-Oct							0
29-Oct	12	17		15			44
30-Oct							0
31-Oct	7	9		4			20
Oct. Total	468	558	358	121	0	0	1505
01-Nov							0
02-Nov	22	5		12			39
03-Nov	3	6		6			15
04-Nov							0
05-Nov	3	2		9			14
06-Nov							0
07-Nov	5	8		7			20
08-Nov							0
09-Nov	9	15		29			53
10-Nov	7	7		13			27
11-Nov							0
12-Nov	1	5		11			17
13-Nov							0
14-Nov	21	21		24			66
15-Nov							0
16-Nov	23	15		11			49
17-Nov	39	22		11			72
18-Nov							
19-Nov							
20-Nov	16	19		12			47
Nov. Total	149	125	0	145	0	0	419
Year Total	617	683	358	266	0	0	1924

LEAST CISCO

2001

Daily Fish Catch by Net - East Channel CRD - October - November

Table 04

DATE	Net # 1 3" Mesh	Net # 2 3" Mesh	Net # 3 3.25" Mesh	Net # 4 3" Mesh	Net # 5 3" Mesh	Net # 6 3" Mesh	Net # 7 3" Mesh	Day Total
09-Oct	56	81						137
10-Oct	75	114						189
11-Oct	46	98						144
12-Oct	70	83	21					174
13-Oct	65	71	17					153
14-Oct								0
15-Oct	80	113	20					213
16-Oct	67	90	20	51				228
17-Oct	95	111	21	49				276
18-Oct	36	67	16	44				163
19-Oct	25	30	11					66
20-Oct	42	76	9	56				183
21-Oct								0
22-Oct	65	73	9	60				207
23-Oct								0
24-Oct	36	49	2	27				114
25-Oct	19	30						49
26-Oct			3	19				22
27-Oct	34	29	4	21				88
28-Oct								0
29-Oct	32	36		29				97
30-Oct								0
31-Oct	32	36		30				98
Oct. Total	875	1,187	132	386	0	0	0	2601
01-Nov								0
02-Nov	31	14		29				74
03-Nov	22	14		9				45
04-Nov								0
05-Nov	13	9		11				33
06-Nov								0
07-Nov	15	8		6				29
08-Nov								0
09-Nov	18	9		9				36
10-Nov	4	3		2				9
11-Nov								0
12-Nov	6	4		2				12
13-Nov								0
14-Nov	13	13		11				37
15-Nov								0
16-Nov	10	8		5				23
17-Nov	5	14		2				21
18-Nov								0
19-Nov								0
20-Nov	16	25		15				56
21-Nov								0
22-Nov								0
23-Nov								0
24-Nov								0
25-Nov								0
26-Nov								0
27-Nov								0
28-Nov								0
29-Nov								0
30-Nov								0
Nov. Total	153	121	0	101	0	0	0	375
Year Total	1028	1308	132	487	0	0	0	2976

HUMPBACK WHITEFISH

2001

Daily Fish Catch by Net - East Channel CRD - October - November

Table 05

DATE	Net # 1 3" Mesh	Net # 2 3" Mesh	Net # 3 3.25" Mes	Net # 4 3" Mesh	Net # 5 3" Mesh	Net # 6 3" Mesh	Day Total
09-Oct	66	40					106
10-Oct	81	44					125
11-Oct	82	64					146
12-Oct	103	72	113				288
13-Oct	64	57	112				233
14-Oct							0
15-Oct	97	87	122				306
16-Oct	75	59	101	51			286
17-Oct	41	34	90	70			235
18-Oct	38	50	101	42			231
19-Oct	59	59	112				230
20-Oct	52	68	150	97			367
21-Oct							0
22-Oct	77	113	188	96			474
23-Oct							0
24-Oct	72	110	181	90			453
25-Oct	38	81					119
26-Oct			188	54			242
27-Oct	60	95	154	69			378
28-Oct							0
29-Oct	103	96		95			294
30-Oct							0
31-Oct	62	65		89			216
Oct. Total	1170	1194	1612	753	0	0	4729
01-Nov							0
02-Nov	65	75		79			219
03-Nov	39	31		47			117
04-Nov							0
05-Nov	52	43		57			152
06-Nov							0
07-Nov	31	67		65			163
08-Nov							0
09-Nov	36	48		43			127
10-Nov	17	38		18			73
11-Nov							0
12-Nov	19	29		18			66
13-Nov							0
14-Nov	43	76		37			156
15-Nov							0
16-Nov	29	49		22			100
17-Nov	30	47		25			102
18-Nov							0
19-Nov							0
20-Nov	43	89		48			180
21-Nov							0
22-Nov							0
23-Nov							0
24-Nov							0
25-Nov							0
26-Nov							0
27-Nov							0
28-Nov							0
29-Nov							0
30-Nov							0
Nov. Total	404	592	0	459	0	0	1455
01-Dec							
Year Total	1,574	1,786	1,612	1,212	0	0	6,184

Yearly Fish Totals

Table 06

Helmericks's Commercial fishery

YEAR	Total Effort	ARCS	LSCS	HBWF	BDWF	Catch Total
1967	774	21,904	15,982	356		38,242
1968	1,427	41,948	19,086	172		61,206
1969	699	19,593	35,001	3,136		57,730
1970	562	22,685	30,650	345		53,680
1971	1,422	41,312	23,887	183		65,382
1972	646	37,101	12,183	1,481		50,765
1973	993	71,575	25,191	5,733		102,499
1974	947	44,937	14,122	4,802		63,861
1975	759	30,953	22,476	1,946		55,375
1976	996	31,659	37,046	1,793		70,498
1977	567	31,796	14,961	1,366		48,123
1978	1,077	18,058	25,761	2,758		46,577
1979	620	9,268	25,097	1,102		35,467
1980	1,209	14,753	30,982	4,232		49,967
1981	501	38,176	15,504	469		54,149
1982	328	15,975	27,085			43,060
1983	520	18,162	37,909			56,071
1984	371	27,686	13,076			40,762
1985	368	23,678	17,383			41,061
1986	151	29,595	9,444			39,039
1987	165	14,788	4,214	1,880		20,882
1988	243	9,012	14,040	6,945		29,997
1989	306	12,145	10,328	5,904	69	28,446
1990	427	11,772	11,064	4,581	2	27,419
1991	446	9,558	3,637	1,658	11	14,864
1992	332	22,754	7,292	5,209	208	35,463
1993	196	31,310	6,037	5,339	19	42,705
1994	210	8,958	10,176	8,827	8	27,969
1995	405	14,311	8,633	10,860	186	33,990
1996	162	21,817	7,796	6,425	258	36,296
1997	225	16,990	10,754	1,721	13	29,478
1998	176	8,752	11,822	5,279	13	25,866
1999	171	8,872	7,430	6,875	436	23,613
2000	93	2,619	5,758	3,706	4	12,087
2001	138	1,924	2,976	6,185	53	11,138

Arctic Cisco Population Size - Fork Length

≤32CM Subsample

Table 07

YEAR	CATCH	TND	CPUE	SAMPLE SIZE	AVE. SIZE	≤32cm SIZE	% TOTAL
1985	23,678	368	64.3	200	33.36	69	0.345
1986	29,595	151	196	250	33.22	99	0.396
1987	14,788	165	89.6	350	34.52	27	0.077
1988	9,012	243	37.1	400	34.62	139	0.347
1989	12,145	306	39.7	350	34.86	74	0.211
1990	11,772	427	27.6	400	32.77	218	0.545
1991	9,558	446	21.4	250	32.74	137	0.548
1992	22,754	332	68.5	450	32.10	299	0.664
1993	31,310	196	159.7	300	33.36	73	0.243
1994	8,958	210	42.7	300	33.88	82	0.273
1995	14,311	405	35.3	400	31.88	277	0.692
1996	21,817	162	134.7	250	32.24	169	0.676
1997	16,990	225	75.5	250	32.76	120	0.480
1998	8,752	176	49.7	300	33.77	91	0.303
1999	8,872	171	51.9	300	33.70	110	0.366
2000	2,619	93	28.2	350	35.20	30	0.086
2001	1,924	138	13.9	357	35.65	61	0.170
2002							

* TND=Total Net Days In Season
* NET DAY=1 Net @2 meter x 50 meter x 24 Hrs.
* CPUE=Catch Per Unit Effort
* Sample Size=Number Of Fish in Weekly Samples

ARCTIC CISCO LENGTH SAMPLES

Table 8

Weekly Samples 3.0 In. Nets

Fork	9-Oct-2001	16-Oct-2001	24-Oct-2001	31-Oct-2001	7-Nov-2001	14-Nov-2001	20-Nov-2001
Length	3"	3"	3"	3"	3"	3"	3"
25							
26							
27	0	0	0	0	0	0	0
28	0	0	2	0	0	0	0
29	0	0	0	0	3	1	0
30	1	4	1	1	2	1	3
31	3	3	2	3	1	1	3
32	4	5	3	3	4	6	1
33	2	6	2	7	2	3	1
34	5	5	7	5	7	5	3
35	7	8	3	7	8	4	6
36	10	5	6	6	7	5	7
37	4	5	7	8	10	6	9
38	7	3	11	4	3	5	5
39	2	3	2	1	3	3	4
40	2	2	2	4	8	6	2
41	2	1	1	1	2	4	2
42	1	0	1	0	0	0	1
43	0	0	0	0	0	0	0
Average	35.76	34.76	35.74	35.38	35.75	36.08	36.06

Fish Measured to Nearest CM-Fork Length
Weekly Sample Size 50 Fish

Note: 7&9 November 60 arcs taken for samples – miscounted out in cold

Note: 20 November sample size 47 fish

28	0	0	56	0	0	0	0
29	0	0	0	0	87	29	0
30	30	120	30	30	60	30	90
31	93	93	62	93	31	31	93
32	128	160	96	96	128	192	32
33	66	198	66	231	66	99	33
34	170	170	238	170	238	170	102
35	245	280	105	245	280	140	210
36	360	180	216	216	252	180	252
37	148	185	259	296	370	222	333
38	266	114	418	152	114	190	190
39	78	117	78	39	117	117	156
40	80	80	80	160	320	240	80
41	82	41	41	41	82	164	82
42	42	0	42	0	0	0	42
Total	**1788**	**1738**	**1787**	**1769**	**2145**	**1804**	**1695**
Average	35.76	34.76	35.74	35.38	35.75	36.08	36.06

ARCTIC CISCO LENGTH SAMPLES

Weekly Samples 3.25 In. Nets

Table 9

Fork	10/16/2001	10/24/2001					
Length	3.25"	3.25"	3.25"	3.25"	3.25"		
25							
26							
27							
28							
29	0	0					
30	1	0					
31	0	0					
32	0	0					
33	2	2					
34	2	2					
35	9	3					
36	6	5					
37	10	10					
38	10	5					
39	4	9					
40	4	7					
41	1	6					
42	1	2					
43	0	0					
Average	36.88	38.04	0.00	0.00	0		

Sample size: Oct. 16th 50 fish; Oct.24th 51 fish.
Fish Measured To Nearest CM Fork Length

28	0	0	0	0	0	
29	0	0	0	0	0	
30	30	0	0	0	0	
31	0	0	0	0	0	
32	0	0	0	0	0	
33	66	66	0	0	0	
34	68	68	0	0	0	
35	315	105	0	0	0	
36	216	180	0	0	0	
37	370	370	0	0	0	
38	380	190	0	0	0	
39	156	351	0	0	0	
40	160	280	0	0	0	
41	41	246	0	0	0	
42	42	84				
Total	1844	1940				
Average	36.88	38.04				

LEAST CISCO LENGTH SAMPLES

Weekly Samples 3 in. Nets

Table 10

Fork Length	9-Oct-2001 3"	31-Oct-2001 3"	9-Nov-2001 3"	20-Nov-2001 3"	3"	3"	3"	
24								
25								
26	0	0	0	0				
27	1	1	0	1				
28	1	1	0	0				
29	5	1	1	3				
30	6	8	1	9				
31	12	8	5	7				
32	15	10	9	7				
33	6	10	8	15				
34	2	9	6	7				
35	3	2	2	1				
36	0	0	3	0				
37	0	0	0	0				
38								
Average	31.43	31.96	32.80	31.86	0.00	0.00	0.00	0.00

Fish Mearsured To Nearest CM-Fork Length
Weekly Sample Size 50 Fish
Note: Oct. 9th sample size 51 fish.
Note: Nov. 9th sample size 35 fish.

CM								
24	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0
27	27	27	0	27	0	0	0	0
28	28	28	0	0	0	0	0	0
29	145	29	29	87	0	0	0	0
30	180	240	30	270	0	0	0	0
31	372	248	155	217	0	0	0	0
32	480	320	288	224	0	0	0	0
33	198	330	264	495	0	0	0	0
34	68	306	204	238	0	0	0	0
35	105	70	70	35	0	0	0	0
36	0	0	108	0	0	0	0	0
37	0	0	0	0	0	0	0	0
38	0	0	0	0	0	0	0	0
Total	**1603**	**1598**	**1148**	**1593**	**0**	**0**	**0**	**0**
Average	31.43	31.96	32.80	31.86	0.00	0.00	0.00	0.00

HUMP-BACK WHITEFISH LENGTH SAMPLES
& Broad Whitefish In 2001

Table 11

Weekly Samples 3 In. Nets

Fork	09-Oct	31-Oct	09-Nov	20-Nov			
Length	HBWF	HBWF	HBWF	HBWF		BDWF	
28							
29							
30	0	0	0	0			
31	1	1	2	1			
32	1	1	1	2			
33	8	2	4	2			
34	3	1	1	7			
35	8	4	10	6			
36	8	4	7	2			
37	7	4	8	10			
38	6	11	8	7			
39	4	11	5	6			
40	2	6	1	2			
41	1	2	1	2			
42	1	2	1	1			
43	0	1	1	0			
44	0	0	0	1			
45				0			
46				1			
Average	36.06	36.96	35.60	35.10			

Sample Size 50 Fish Each
Fish Measured To Nearest CM Fork Length

CM							
28	0	0		0			
29	0	0	0	0			
30	0	0	0	0			
31	31	31	62	31			
32	32	32	32	64			
33	264	66	132	66			
34	102	34	34	238			
35	280	140	350	210			
36	288	144	252	72			
37	259	148	296	370			
38	228	418	304	266			
39	156	429	195	234			
40	80	240	40	80			
41	41	82	41	82			
42	42	84	42	42			
43	0	43	43	0			
44	0	0	0	44			
45	0	0	0	0			
46	0	0	0	46			
Total	1803	1848	1780	1755	0		
Average	36.06	36.96	35.60	35.10	0.00		

James Helmericks' Commercial Fishery

Table 12

2001 Tag Returns

DATE	CO_NAME	TAG_ID	SPECIES	WGT_GRM	F_Lth_MM	SEX	B_CAV	STOM_V
11-Oct	LGL92	02420	LSCS	387	348	Fso	0.0	0.00
13-Oct	LGL90	08784	LSCS	429	328	Fm1	0.5	0.25
19-Oct	LGL93	14576	LSCS	284	314	Mso	0.0	0.00
20-Oct	LGL91	04728	LSCS	369	345	Fso	0.0	0.00
	MJM-01	01637	LSCS	290	320	Fm2	4.5	0.00
22-Oct	LGL91	13200	LSCS	357	332	Fso	0.0	0.00
24-Oct	LGL91	01925	LSCS	345	333	Fm1	1.5	0.00
29-Oct	LGL92	16255	LSCS	329	335	Fm1	0.5	0.00
03-Nov	LGL93	06576	LSCS	278	311	Fm1	1.0	0.00
16-Nov	LGL93	11100	LSCS	405	343	Fm2	3.0	0.00

Commercial Fishery Mean Totals All Species

1985 to 2001

Table 14

Arctic Cisco

Year	Total Catch	Total Effort	Actual CPUE
1985	23,678	368	64.3
1986	29,595	151	196.0
1987	14,788	165	89.6
1988	9,012	243	37.1
1989	12,145	306	39.1
1990	11,772	427	27.6
1991	9,558	446	21.4
1992	22,754	332	68.5
1993	31,310	196	159.7
1994	8,958	210	42.7
1995	14,311	405	35.3
1996	21,817	162	134.7
1997	16,990	225	75.5
1998	8,752	176	49.7
1999	8,872	171	51.9
2000	2,619	93	28.2
2001	1,924	138	13.9
1991 - 2000 10 yr Mean	**14,594**	**242**	**66.8**

Least Cisco

Year	Total Catch	Total Effort	Actual CPUE
1985	17,383	368	47.2
1986	9,444	151	62.5
1987	4,214	165	25.5
1988	14,040	243	57.8
1989	10,328	306	33.8
1990	11,064	427	25.9
1991	3,637	446	8.2
1992	7,292	332	22.0
1993	6,037	196	30.8
1994	10,176	210	48.5
1995	8,633	405	21.3
1996	7,796	162	48.1
1997	10,754	225	47.8
1998	11,822	176	67.2
1999	7,430	171	43.5
2000	5,758	93	61.9
2001	2,976	138	21.6
1991 - 2000 10 Yr Mean	**7,934**	**242**	**39.9**

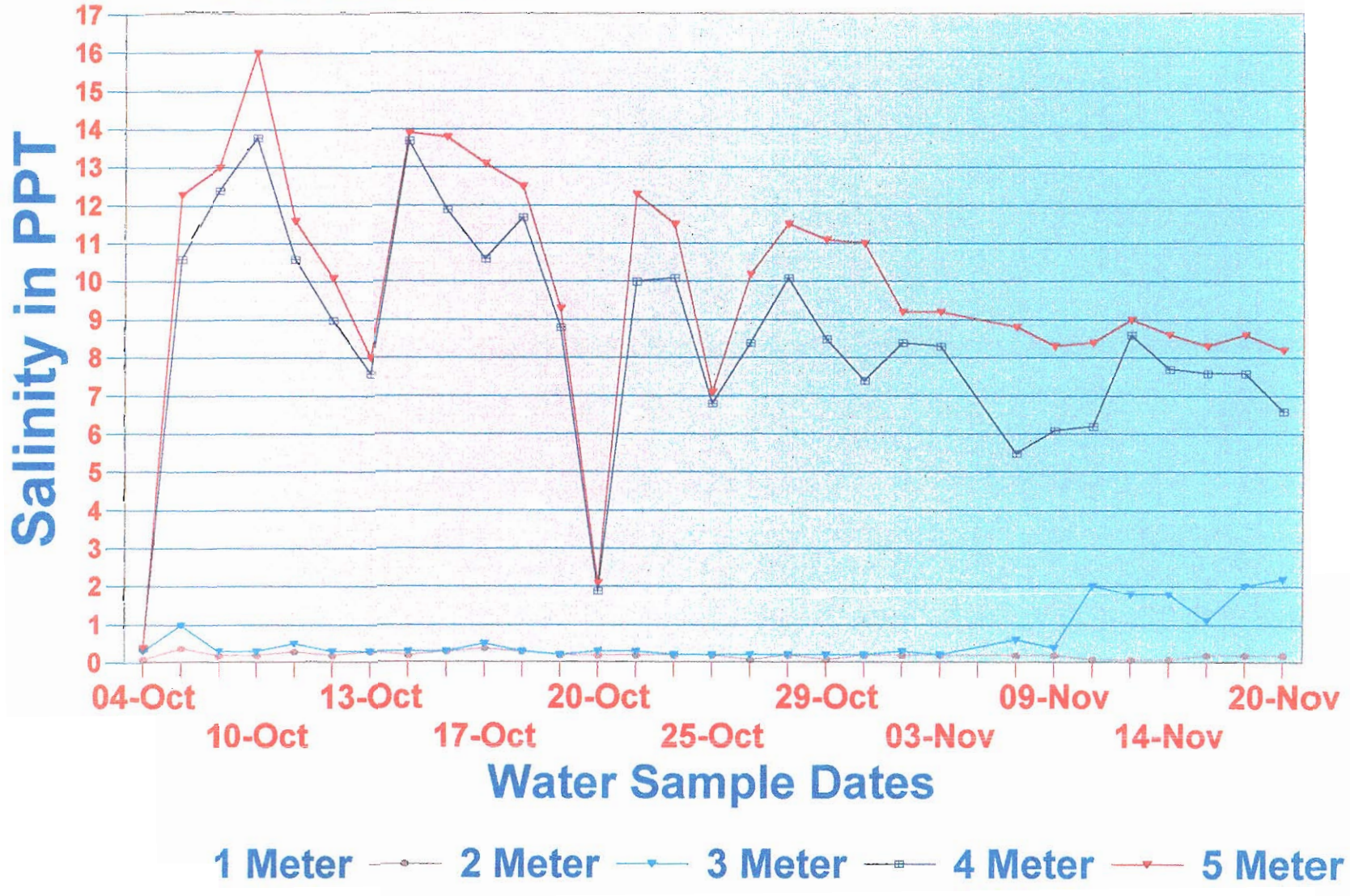
Humpback Whitefish

Year	Total Catch	Total Effort	Actual CPUE
1985		368	
1986		151	
1987	1,880	165	11.4
1988	6,945	243	28.6
1989	5,904	306	19.3
1990	4,581	427	10.7
1991	1,658	446	3.7
1992	5,209	332	15.7
1993	5,339	196	27.2
1994	8,827	210	42.0
1995	10,860	405	26.8
1996	6,425	162	39.7
1997	1,721	225	7.6
1998	5,279	176	30.0
1999	6,875	171	40.2
2000	3,704	93	39.8
2001	6,184	138	44.8
1991 - 2000 10 Yr Mean	**5,590**	**242**	**27.3**

Char Island Station

Chart 01

2001 East Channel - Colville River



Salinity Average Char Island

Chart02

1995 - 2001

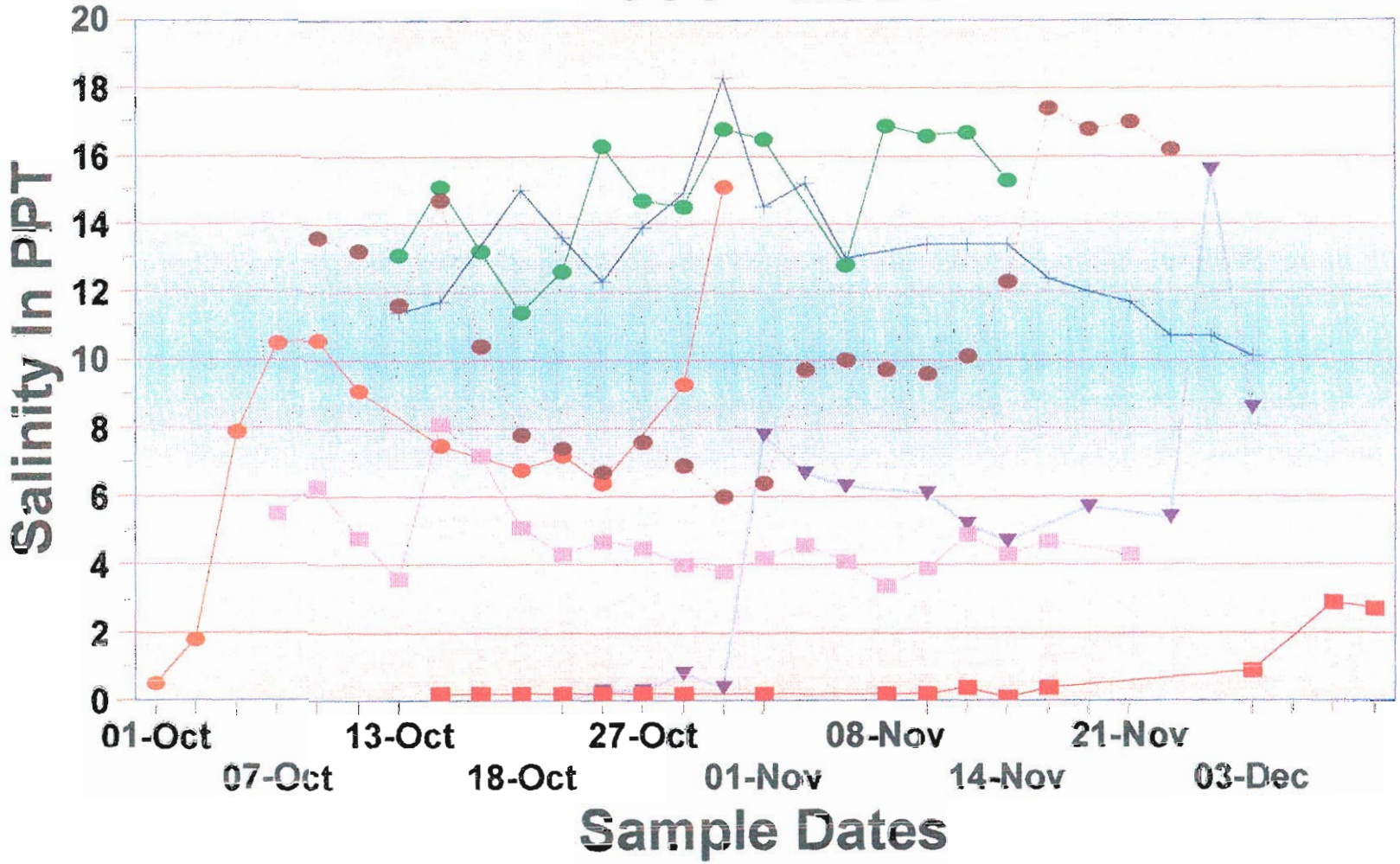


Chart 03

Salinity Average Char Island

Low Years-1992 to 2001

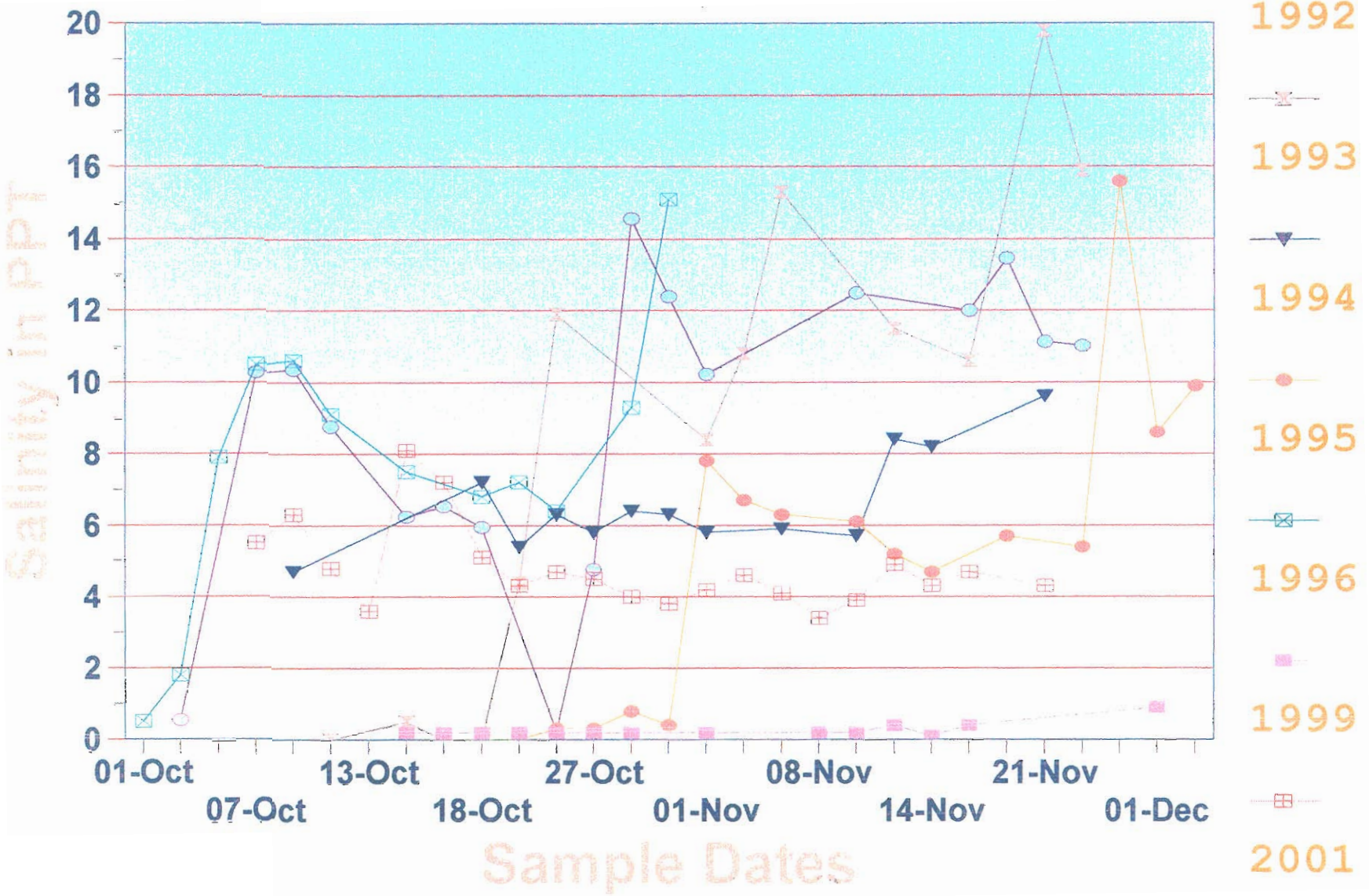


Chart 04

Least Cisco

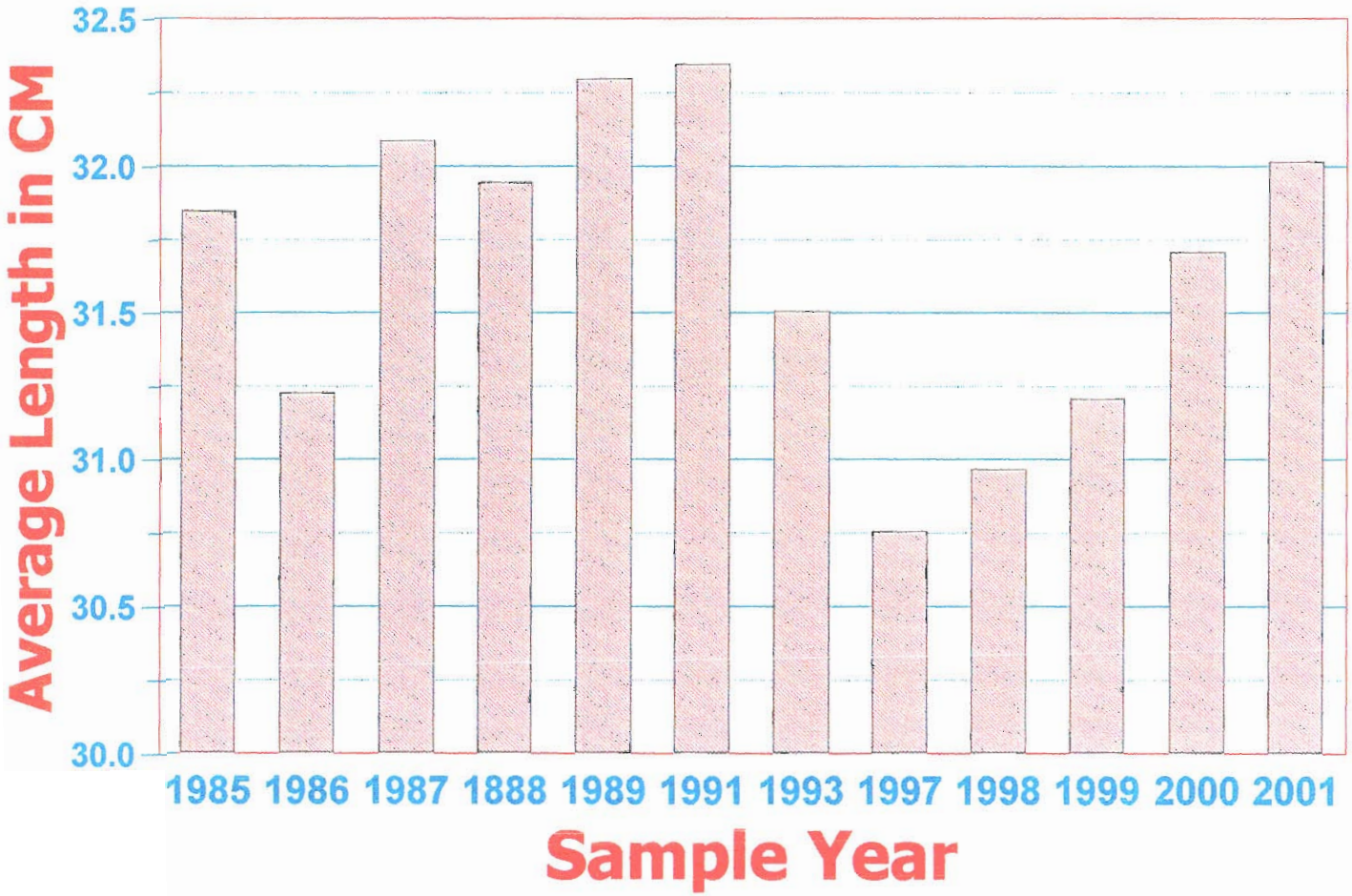


Chart 05

Daily Total Catch

By Species in 2001

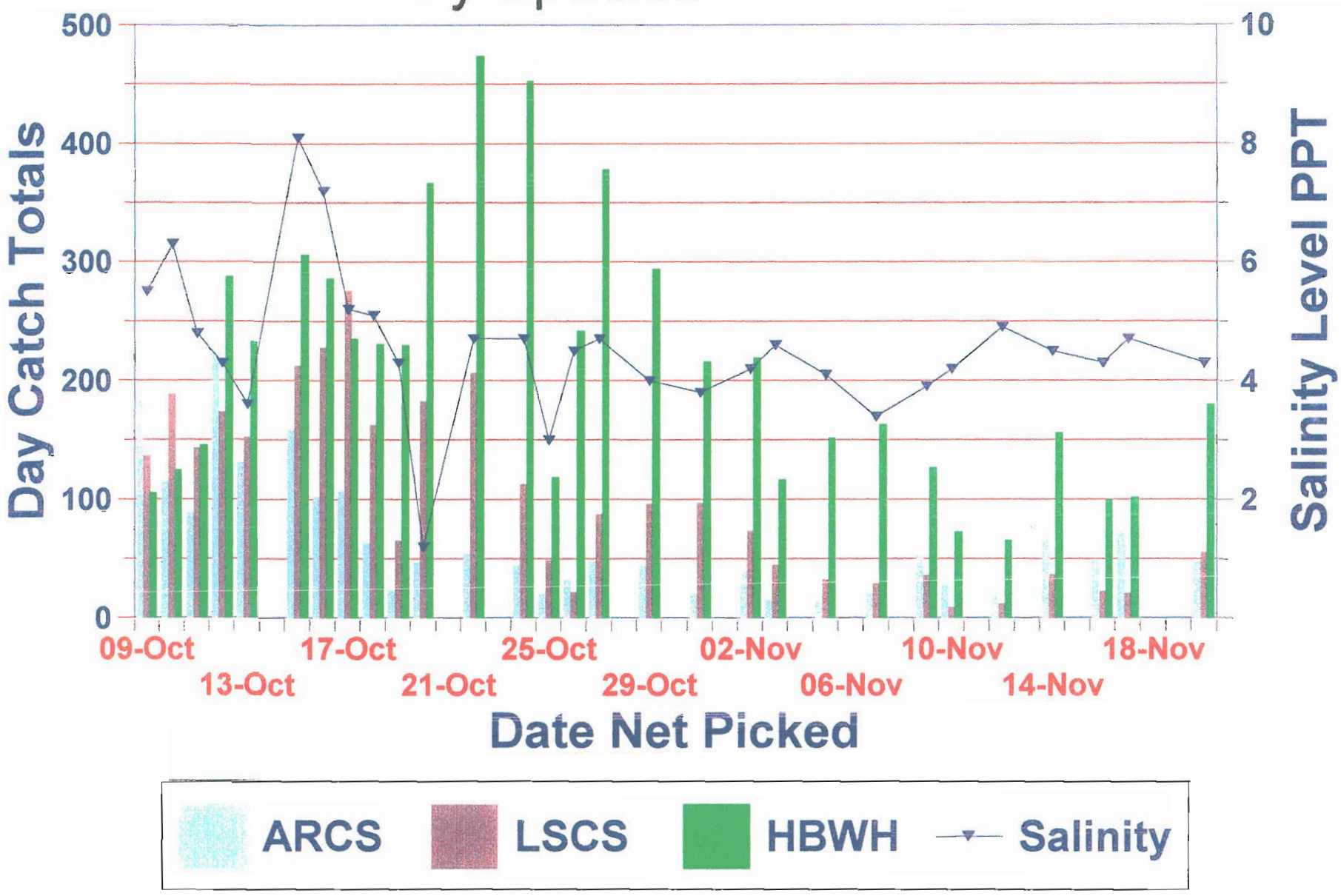


Chart 06

Arctic Cisco Movements

Salinity & Direction