

Document Summary

Report #	1
ReportTitle of coho	The effectiveness of selectivity grids in seine bunts to permit the escape
ProjectTitle	NA
Author	Pacific Fisheries Research & Development
ReportDate	nd
ProjectYear	1999
Proponents	Bob Rezanoff
State	BC
Objectives listed above to objective	Objectives. The intent of the 1999 project was to minimize the factors ensure the best possible survival. The first objective was to implement the recommendations from earlier work as closely as possible. The second was to determine coho numbers being released from the escape bunt in
Gear	sock brailler; chute system; smaller mesh knotless webbing in bunt
Results considerably observed considerably with a twine as of the the	Results. The experimental vessel captured and allowed to escape more smaller fish than the control vessel. Some of the escaped fish were returning through the grid into the main bunt. On the fourth day, when more fish were captured than on previous days, the grids were allowing fish girth of more than 50 mm to escape. The grids were then stiffened by using reinforcement between the bars. This did not completely solve the elasticity grid bars. The experimental net allowed larger coho to escape compared to control net; the control net retained considerably more larger coho. There is

no explanation for this but it is not a desired effect for coho in the control net.

Marketable size pinks were observed escaping through the grids. It was therefore decided to test grids with a smaller gap. Grids with a 47 mm gap were tested during the last three days of phase 2. These grids retained more smaller fish ut the escaped pinks were still considered too large. The gap was further reduced to 43 mm by wrapping twine tightly around each alternate bar of the grid. This did not allow any pinks to escape. It was concluded that a 45 mm grid spacing would allow the retention of all marketable pink salmon. The use of a sock brailer improved the quality of fish taken

Conclusions Grids are effective for releasing under-sized fish of a given species when installed in a suitable location in the bunt. 45mm grid spacing would allow retention of all marketable pinks. 47 mm grids would suit a fishery in a sockeye year; 42mm grids would be suitable in a pink year. 5-10 grids would be sufficient in a bunt.

Quality of fish taken on board was increased by use of a sock brailer. Concern that size in different runs of same species could be different, requiring adjustments to

Recommendations To ensure that experimental selective fishing projects produce data that can be compared with other experiments and that can stand the test of time, they should be conducted under the guidelines and protocols produced by DFO (in 1998).

Outcome Objectives met

Sector Seine

SubSector Escape grids

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Report #	2.1
ReportTitle	Preliminary study of the use of a salmon fish trap.
ProjectTitle	NA
Author	Fred Hawkshaw
ReportDate	October 1998
ProjectYear	1998
Proponents	Fred Hawkshaw
State	BC
Objectives drifting/fixed	to design, build, understand and endeavor to make work a floating, salmon trap to selectively capture target species for live transport to town well
Gear leads, sorting into the or two plunger (for	Gear: two wings (300 feet long by 30 feet deep); 1 trap, consisting of three leading the fish into a framed (surface) pen; one or more rigid cage(s) for that are secured to the back of the pen by means of a tapered lead inserted cage; 3 live transport vessels; 1 herring skiff to set and retrieve the trap; one skiffs working around the trap to assist with sorting of fish; one dip net; one (for moving the fish into the back sorting cage); 1 2 in. Briggs and Stratton,
Results proposal with the was added the anchored held it	Results: due to an inordinate amount of designing and late approval of the no salmon were caught this year. Many trials and tests were done, mainly idea of getting the trap to look and work the way we envisioned it. All testing done within the confines of Prince Rupert harbour. Before the wings were trap was easy to handle that would hold it shaped or he well unless was workload. Once the wings were added, it was a lot harder to maneuver that

shaped much better without being towed it was windy, holding the shape of
the

Conclusions Conclusions: the proponents believe the trap will be a very effective
tool for selective fishing. Its financial feasibility for three vessels has not been tested. It
appears to be

Recommendations None in document.

Outcome Results inconclusive

Sector Alternate

SubSector Fish trap

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Report # 2.2
ReportTitle Skeena wild fish trap
ProjectTitle NA

Author	Fred Hawkshaw
ReportDate	October 1999
ProjectYear	1999
Proponents	Fred Hawkshaw
State	BC
Objectives	to test the economic efficiency and biological selectivity of a fish trap
Gear holes	trap consisting of three tapered leads with "pass-through" holes, leads and decreasing in size, leading to the cod end (photos in report).
Results the trap hang up white needs to corners. The to allow 300 ft. to needs the	The trap is very successful for live handling of fish. For some applications needs to be somewhat shallower. The web in the cod-end needs to be slightly larger because fry are afraid to pass through voluntarily and occasionally when crowded out. White twine in the mouth was dyed black because the color was felt to be scaring fish. The web in the trap section of the cod-end be slightly smaller because smaller salmon get stuck in the web in the apron in the mouth of the trap should be only 35 feet deep instead of 40 feet more flexibility to fish in water of different depths. The wings were cut from 150 feet because they were to awkward to handle. The web in the wings only to be 10 inch mesh, minimum 8 inch, not three and 5/8 inch. This would make
Conclusions behaviour and their 1,276 fish understanding of trap back out	Getting this trap to work is mostly a matter of understanding fish reaction to web. Many fish harvested were delivered live to dock. Best set: in a 1.5 hour tow with no web mortalities: 1,243 pinks; 21 coho; 4 sockeye; 5 steelhead; 3 chum. While location is important as in all fisheries the area, the trapped in the target species is even more important. Fish in the were observed idly swimming behind the opening but instead of swimming

of the trap they moved away from the opening and swam along the web until they couldn't move ahead anymore. Extending the room between into leads should maximize the chances of fish staying in the trap rather than swimming out.

While the trap has the disadvantage of being very directional, unlike a gillnet, it has the advantage of holding onto its catch while being fished, unlike a seine. Use of a sorting cage at the cod-end to harvest would allow the trap to keep fishing.

When revival tanks were loaded with approximately 400 pink salmon, high stress levels experienced by the fish were directly attributable to low oxygen levels.

Mortality was around 1-2% but this could have been a combination of damage from web and low oxygen. Once we learned what level the fish can tolerate (50-60%) we had no more problems and mortality was contained to web-damaged fish. Overcrowding seemed less of a concern than oxygen level. So long as a good clean flow of water was maintain, there was no trouble with mortality. If fish are significantly damaged by the web (scales or slime removed) survival is definitely in question. With some modification to web size in a couple of places, damage, mortality and stress to least that target and non-target species would be about as low as it gets (certainly at picking up the of a well-handled seine and possibly better). If care is not taken when clear trapped, fish can be caught in pockets of loose web. When this happens the towards the cod-end. This only occurs when some fish have not moved to the cod-end when picking up is started. The addition of a purse line to a trap could significantly increase its success. A purse line would make a trap more efficient and less risky by preventing escape of "uncommitted" fish in front of the trap area. It would also make it more acceptable for fishermen to go slower and more carefully when picking up the trap. Time spent sorting fish is time away from fishing. It took 3-1/2 hours to sort through 1,300 fish. That's not a problem if the weather is good and

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Recommendations Experiments should be conducted in areas with which fishermen
are familiar to

avoid confusing results attributable to the gear to those attributable to fishing

and

Outcome
Sector

Needs further study
Alternate

Report # 2.2

unknown area.

SubSector Fish trap

wings much easier to handle allowing water to pass through, creating less
drag.

consideration fishing occurs seven days a week. It fishing time is limited, serious
should be given to the idea of a sorting cage so that fishing can continue.

While

compromise increased speed could lead right back to bad handling practices, a
water. needs to be found. The trap appears to be best fished in river or during slack
likely to If used during maximum flood or ebb tides it might be quite risky. The trap is
the web be extremely effective in an estuary. More work is required on maturing chum
prevent salmon in traps because once their teeth start to develop they get trapped in
and the more easily. This could probably be resolved by adding in pieces of web to
fish from getting too far into the corners between the leads and ramp webs
side and bottom of the trap.

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Report #	3
ReportTitle	Lax Kw'alaams fish trap project
ProjectTitle	NA

Author	Stan Dennis Sr
ReportDate	November 1999
ProjectYear	1999
Proponents	Lax Kw'alaams
State	BC
Objectives utilizing local net fishing and	1. To build and fish a selective trap in two northcoast fishing areas, menders and fishers. 2. To assess the viability of the trap as a commercial method that would allow fish to be selectively released with optimum survival
Gear	trap
Results from bins. 2. trap with factors really Handling of Crew size: difficulties	1. Condition of fish: stress from handling was minimized by dipnetting Effectiveness at catching fish: questionable (control net caught 1,504 fish; caught 36) attributed to need for improved design and familiarity of fishers optimal operation. 3. Stability of trap in different locations: good; critical appear to be tide and weather. 4. Effectiveness at handling large runs: never tested but would appear to be good if deployed for longer periods. 5. non-target species: never really tested as no coho were encountered. 6. large crew required to handle trap. 7. Weather & tides: trap experienced
Conclusions to-head test on fish into familiar with	The trap net and control net that very different results in the one head- July 31, 1999. The project team hypothesizes that the trap caught fewer fish because: 1. The wings of the trap were not wide enough to properly funnel the trap opening; 2. The trap was built too shallow which allowed fish to swim underneath the trap and escape capture; 3. The project team was more
Recommendations	The trap was deployed in several ways: (1) tied to the beach by one wing, (2) towed

adapted to
times
depending
high
catch in
to
withstand
deploy,
no
extend
is
for

this
some
heavier.
fathoms
team has
early

by vessels, (3) anchored in place. This illustrates that the trap can be different sites. It can therefore be used to fish in different areas, at different and for different species. The efficiency and effectiveness of the trap vary on tide and weather conditions. The ability of the trap to work effectively with volumes of fish was never really tested during this project. The maximum any one set was 36 fish. The number of fish caught by the trap seemed only depend on the length of the set. It appears that the trap can successfully large numbers of fish without damage. The trap requires a lot of people to manage and transport. With the trap's proven ability to catch fish with little or harm, and release non-target species unharmed, it would be possible to fishing times for traps. If traps could fish during times when the gillnet fishery closed for coho conservation concerns, traps could take volumes necessary economic viability. The trap did experience difficulties when deployed in rough weather and heavy tide conditions. The primary problem encountered was a tendency for the trap to drift back in heavy tides, closing the trap aperture and preventing fish from entering. In-season modifications were made to address problem. The lead line was made heavier which counteracted the problem to degree, but the crew believes the trap needs to made larger, deeper and The crew believes the trap needs to be lengthened from 65 fathoms to 150 and its depth extended by 4 fathoms to a total of 12 fathoms. The project three recommendations for the trap's future use: (1) start fishing in Area 3 in

Outcome Needs further study

Sector Alternate

SubSector Fish trap

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Report # 3

ReportTitle Clear selectivity grids in seine bunts--final report

ProjectTitle NA

Author Paul Andrew Brajcich

ReportDate nd

ProjectYear 1999

Proponents Paul Andrew Brajcich
minimal environmental damage.

State BC

Objectives their retention to test escape grids of various shapes, designs and opaqueness for
of target species and release of non-target species.
when deployed in rough weather or heavy tides. 8. Predation: seals circled

trap and Gear escape grids in the bunt of a seine net: oval grid; circle panel; aluminum
grid

Results very well in Results. Fish were observed escaping the oval grid. The circle grid work
allowing easy escapement of fish attended to deal larger fish (ie, fish larger
than the diameter of the holes). The aluminum grid also worked well. Holes drilled
into the pipe allow them to fill with water and stay vertical. No fish were gilled with
aluminum

Conclusions through Oval grid: worked well (does not float; easy to work with on drum and
spooling pins; good memory for returning to original shape); 45 degree
corners work better than round corners. Circle panel: worked well (easy escape for
fish regardless of position of bunt while being lifted from water but fish larger than
diameter of holes were easily gilled. Aluminum grids: no gilled fish with this

design but more difficult when drumming net and through spooling pins. 80% of pinks

Recommendations Oval grid: more grids in the front part of the bunt; do not use cork
line border web to avoid gilling smaller fish; oval grid should be 1/4 inch-1/2 inch wider. Circle
Panel: rounded outside edge should be changed to 45 degree corner (as on the oval
panels); a soft rubber ring could be inserted around the holes to avoid gilling;
more panels should be placed in the front part of the bunt; use bunt web instead of
cork line border web to avoid gilling smaller fish; for northern pinks a 4-1/2 inch
circle might work best; a combination of grids in the front part of the bunt followed
by circle panels in the mid- to back part of the bunt should dramatically increase the
amount of escaping fish; large sockeye and small chum were being gilled by the 4-
3/4 inch holes, resulting in reduced prices for damaged fish. Aluminum grid: aluminum
grids might work better if coated or painted a flat color; a combination of aluminum
grids in the front part of the bunt followed by various size circle panels in the mid-
to back

Outcome Needs further study

Sector Seine

SubSector Escape grids

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Report # 6

ReportTitle 1999 overview report on the lower Skeena River catch monitoring program

ProjectTitle NA

Author Jim Culp

ReportDate October 1999

ProjectYear 1999

Proponents J. & S. Outdoor Ventures Ltd

State BC

Objectives Overall: To evaluate the impact of the Skeena River chinook sport fishery on Skeena coho in the Skeena River chinook salmon sport fishery is significant or insignificant. Specifically, 1. To determine if the bycatch of coho in the Skeena River chinook salmon sport fishery is significant or insignificant. 2. To determine if anglers were selective as a result of using specific gear designed to catch chinook salmon but not coho salmon. 3. To determine if other/different fishing gear released. Record data on injury and mortality to non-target species that must be recorded. Record data on water temperature, turbidity, level and weather conditions. Record data on where fish were hooked; how landed and treated before release; and angler results (see report for details)

Conclusions Data reporting only; analysis to follow in J. O. Thomas report. Tentative conclusion from report author that the project confirmed the position of the sportfishing community that the chinook sport fishery is selective in that not many coho were caught relative to the total number of migrating through the fishery. Use of large #0 or #2 spin-n-glo in conjunction with barbless hooks (implemented in 1998) made

Recommendations Enough is known about the bycatch of coho in the Skeena River

chinook fishery to make a decision that the fishery is selective enough for it to continue. There are, however, other options that could be considered to make it more selective: (1) there should be a closer examination of the bait fishery on the lower bars to determine if more coho were caught using bait the artificial lures; (2) it would be useful to examine in more detail the way anglers land fish in bar fisheries. An education program is needed on how to land fish on gravel bars to improve survival

rates of

Outcome Results inconclusive

Sector Hook & Line

SubSector Recreational

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Report # 7
ReportTitle 1999 coho encounter monitoring program in the upper Skeena watershed
ProjectTitle NA
Author Darryl Struthers

ReportDate	October 1999
ProjectYear	1999
Proponents	Toboggan Creek Salmon and Steelhead Enhancement Society
State	BC
Objectives fished for times	To determine the number of coho salmon encountered while anglers chinook, pink and steelhead, to assist managers in determining best fishing times
Gear techniques,	Detailed catch monitoring together data on encounters, fishing gear and handling and release practices, and condition of released fish.
Results	(see report for details)
Conclusions catch first coho August hooked using pool. during the were large monitoring sites. chinook and two when fish smaller	Total fish caught = 107 chinook, 5 coho, 6 pink, one steelhead. Total estimated by over-flights = 270 chinook, 13 coho, 9 pink, 3 steelhead. The encountered during the study was on Aug. 14 at Moricetown Canyon. On 15th, 4 more coho were retained at Moricetown Canyon. All coho were spoon-type lures. The river at the catch site is slow-moving with a large lack Coho seem to rest in this water before heading up through the canyon. study, notion of were caught in this water watchers were at the site. Chinook caught in faster flowing water in front of the site and in the pool in front of a downstream Island. No coho were encountered at any of the other a number of coho encountered during the study supports keeping the pink salmon fisheries open on the Bulkley and Morice Rivers during the first weeks of August. the use of bait and barbed hooks should be considered these fisheries are opened in August. Gear selection and the type of water influence coho capture. Anglers who fished slower moving water and used

Recommendations recreational system such of release handed rod and as newspaper and the be salmon influence to use large concern

1. A system should be put in place so anglers know whether the chinook, coho and pink fisheries will be open each August. An indexed as the Skeena test fishery is suggested. 2. Public education and awareness salmonid identification and correct release techniques need to be addressed. Anglers could be educated about salmonid identification and catch-and- techniques by (1) signage a popular angling sites; (2) information leaflets out with licenses; (3) public education by Fisheries and Oceans staff at local gun club meetings, possibly with assistance of clubs and organizations such the BC Wildlife Federation; (4) through media (eg, radio, television, magazine articles). 3. The catch monitoring program should be continued in upper Skeena watershed. 4. Targeted catch-and-release fisheries should not allowed on stocks of concern (eg, coho salmon). 5. The number of coho encountered from August 1-15,1999 supports keeping the chinook and pink fisheries open on the Bulkley and Morice Rivers during the first two weeks of August. The use of bait and barbed hooks should be considered when these fisheries are open in August. 6. Gear selection and the type of water fished coho capture rates. Anglers should be asked not to fish slack water and not small lures that target coho, especially when the season is closed. 7. To a extent, anglers enforce their own fisheries. Anglers that target stocks of

Outcome Objectives met

Sector Hook & Line

SubSector Recreational

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Report # 7

ReportTitle Preliminary study on the use of the selective salmon trap net--north coast

ProjectTitle NA

Author Ken Kristmanson

ReportDate October 1998

ProjectYear 1998

Proponents Ken Kristmanson

State BC

Objectives To test a fixed salmon trap net for effectiveness of catching target salmon species (sockeye, pink, chum) or releasing non-target species (coho, chinook, steelhead).

Gear fixed salmon trap net

Results Main operational concern was the size of the web being used. Existing web was replaced with 3 in. knotless web suggested by biologists. With this web, there is a problem with fish entering the second heart. That caused the net to float up, raising and not to use small lures the target coho.

Conclusions Remove one short heart and attach a lead line to heart to keep them apart and down. Lack of funding in the onset of the fishing season didn't allow time to revamp

Recommendations To have trap ready for use in time for the peak return of the salmon in the late

Outcome Results inconclusive

Sector Alternate

SubSector Fish trap

made such as coho endanger the fishing opportunities of all. The public should be

are aware of the opportunity to extend fisheries in years of low abundance if they selective in their fishing methods.

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Report #	8.2
ReportTitle	Preliminary study on the use of the selective salmon trap net--north coast
ProjectTitle	NA
Author	Ken Kristmanson
ReportDate	October 1999
ProjectYear	1999
Proponents	Ken Kristmanson
State	BC

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Management\Gordon Curry\Cohen - Gord Curry\2005\Fi
sheries Management>Selective Fishing\

Objectives salmon species	To test a fixed salmon trap net for effectiveness of catching target (sockeye, pink, chum) or releasing non-target species (coho, chinook, steelhead).
Gear	fixed salmon trap net
Results web was is a raising	Main operational concern was the size of the web being used. Existing replaced with 3 in. knotless web suggested by biologists. With this web, there is a problem with fish entering the second heart. That caused the net to float up, raising
Conclusions apart and revamp	Remove one short heart and attach a lead line to heart to keep them down. Lack of funding in the onset of the fishing season didn't allow time to revamp
Recommendations	
Outcome	Results inconclusive
Sector	Alternate
SubSector	Fish trap

Report # 9

ReportTitle Canoe Pass selective paddle trap

ProjectTitle NA

Author Jeff Pearson

ReportDate December 1999

ProjectYear 1999

Proponents Robert Pearson

State BC

Objectives employment opportunities value to holding construction
To test new methods of increasing harvesting selectivity. To provide opportunities for fishermen who been faced with limited harvesting due to increased conservation concerns. To explore potential for adding value to salmon harvested by handling fish individually and at a slower pace to ensure optimal quality. To explore the potential for keeping caught salmon alive and holding pond until ready to be processed. To design a fish trap with minimal construction

Gear Paddle Trap

Results trap was
The project was unable to start on time to to a delay in its approval. The therefore not tested on the target run of sockeye. There was a steep learning

curve
 increase in
 through
 higher. Seal
 congregated at
 stage of
 opposite to
 morning or

and extensive equipment tuning. Once accomplished, there was a vast
 the number of salmon captured. The total number of salmon migrating
 Canoe Pass appeared lower to the trap operators than in previous years. The
 operators felt the catch would have been higher if abundance had been
 predation was a problem. On several occasions a number of seals
 the opening of the leads, disturbing the fish as they entered the trap. The
 the tide had a significant impact on catch: run-out tides generally have larger
 catches than operating periods where the tide was backing-up -- this is
 the traditional gillnet fishing that occurs in this area. Optimal operating times
 coincided with run-out tides during periods of darkness such as early-

Conclusions
 at capturing
 necessary. It
 such as
 before

The number of fish caught proves the viability of the paddle trap design
 all species of salmon. The trap was easy to operate and relocate when
 was easy for the captured fish to be counted and monitored. Individual fish
 coho could be collected by use of a dipnet to record data and take samples

Recommendations
 means of
 merits of this
 trap on
 would
 which it

There would appear to be viability to employing a paddle trap as a
 selectively harvesting salmon. At the least, a further investigation of the
 system should be conducted. This could include extended operating times
 throughout the salmon season, experimenting with the effectiveness of the
 different salmon species when they are available. An earlier starting time
 allow for the paddle trap to more successfully target sockeye salmon, for

Outcome Objectives met

Sector Alternate

SubSector Fish trap

Report # 10

ReportTitle TNFR20 Floating trap net

ProjectTitle NA

Author Gerry Diakow

ReportDate November 1999

ProjectYear 1999

Proponents Gerry Diakow

State BC

Objectives salmon To test a selective salmon trap capable of harvesting targeted surplus stocks in numbers sufficient to compensate for the effort expended and costs incurred (including monitoring costs) and inflicting no mortality on untargeted

Gear Floating trap net

Results sturgeon, carp, chub, squawfish and sculpin. The salmon catch included five sockeye, 97 coho, 503 pinks, 6 chum, 4 chinook and 2 steelhead. All fish captured in the holding pen were counted and then released into the river unharmed and in a vigorous condition. The gear stood up well withstanding even the strongest wind storm event on record for

Conclusions After an initial period of fine-tuning the prototype gear performed well. There were, however, few opportunities to test the trap's capabilities. On only one occasion was a large school consisting of 1,000 or more pinks observed in the heart of the trap. The project team believes the trap in its final version is capable of catching large pools of salmon. As the project involved, it became apparent that the most critical areas requiring modification were the heart and tunnel. The capacity to adjust the depth of both the inner and outer hearts to keep the web taught and in a near-vertical position extending from the river bed to the surface (ie, to eliminate billowing of the web) is essential. One approach to addressing this problem would be to adjust the incorporate boom sticks in the interior of the heart to permit fishermen to falling heart components to accommodate changing river depths due to rising and would tides in much the same way as the tunnel is adjusted. A second holding pen testing. make it possible to isolate non-target fish or fish designated for scientific because Two and preferably three gillnet vessels are required to operate the trap drummed fishing windows are brief (1/2 to 1-1/2 hours). The trap is too large to be as onto a single vessel. Daily communication with other selective gear operators

Recommendations 1. Facilitate testing by setting the trapping clear shallow water. 2. Test the trapnet's ability to catch target species when salmon are migrating significant numbers. 3. Consider additional modifications and innovations such as the addition to the heart of boom sticks, a gate for sealing the first entrance to the heart, a bottom made of web and sewn to the inner heart which, when raised, would force fish into the spiller, a second, predator-proof holding pen, a predator-proof spiller, and replacing the 3 inch web on the sides of the spiller with 1-3/4 inch web. 4. Extend lead time for preparing gear and mobilizing fishermen. 5. Established channels of

Outcome Objectives met

Sector Alternate
SubSector Fish trap

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Report # 11
ReportTitle Development and testing of free floating trap nets--progress report
ProjectTitle NA
Author Kanji Tsumura
ReportDate August 1999
ProjectYear 1999
Proponents BC Ministry of Fisheries Research and Development Section
State BC
Objectives a single harvest target determine management. to develop and test a free floating trap net designed to be operated from gillnet vessel. To determine the effectiveness of trap nets to live capture and different salmon species. To determine short-term mortality rates of non-species (steelhead, coho) at capture and after release in holding pins. To determine the feasibility of trap nets for use as an assessment tool in fisheries management.
Gear mobile, and able to An alternative to gillnet technology that is environmentally acceptable, not rigidly site-specific. Marine birds or mammals entering the trap box are able to

Results
freshwater
number
trap

The trap net did not catch fish up to expectations based on experience in lakes. It is not understood why sockeye salmon did not enter the trap box. A number of sockeye salmon were seen to hit the lead but no fish were captured in the trap box. Whether the fish dove under the net or turned around is not known. To determine if the opening of the heart was too narrow or the funnel opening too

Conclusions
the two strand
The
nets
tow.

Of the netting material used to construct components of the trap net, knotless black netting material appears to be best suited for this application. The other materials were bulky and extremely heavy when wet. The thicker twine dragged much more water than the finer two ply net and were much harder to tow.

Recommendations
the next series of
redesigned
gillnets are
constricted

Additional alterations to the design of the trapnet are required. In the next series of trapnet modifications, effort will be concentrated on designing the trap so that salmon will enter the heart and trap box more readily. The trapnet will be so that the lead will be set in the direction fish move (in contrast to how gillnets are set). The next step in modifications will involve development of a less constricted

Outcome Needs further study

Sector Alternate

SubSector Fish trap

Report # 12.1

ReportTitle 1997 Fraser selective salmon fisheries--final report

ProjectTitle Tooth net

Author J. O. Thomas

ReportDate March 1998

ProjectYear 1997

Proponents Mark Petrunia

State BC

Objectives
chum run of to test a 3.5 inch mesh tooth net on the Fraser River during the early

Gear
meshes deep; Selective fishing gear and methods. Control: 100 fathoms long; 120
long; 3.5 inch mesh hung 3:1; lead line = 1.3 lbs per fathom. Test net: 100 fathoms
mesh, 50 top = 17 inch mesh, 14 meshes deep hung 2:1 or less; bottom = 3.5 inch
meshes deep hung 3:1; lead line 1.3 lbs per fathom. The net was set by
freewheeling off the drum as the vessel was driven forward in a continuous S-

Results
regarding 90% or more of each species caught were released alive. No conclusions
mortalities, and differences in mortality rates between the standard and modified nets were
apparent. Seal predation accounted for 40-45% of coho and chinook
by the 3-10% of sockeye and pink mortalities. 55% of coho mortalities were caused
net. 97% of sockeye mortalities were attributed to the net. No mortalities were
attributable solely to fish handling. Catch of all species was lower in the
modified net. Reductions in catch ranged from 36% for chum; around 60% for chinook

and

Conclusions than standard No conclusion regarding mortalities. Modified net was less effective net at catching salmon.

Recommendations if it provides Further evaluation of the modified net will be required to determine reduction in mortality rates of non-target species. The possible effects of multiple captures and longer set times (both of which are likely to occur in commercial applications) should be examined. The net mortality rate for sockeye should be a consideration in contemplating use of tooth nets where there are conservation

Outcome Results inconclusive

Sector Gillnet

SubSector Toothnet; weedline

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Report # 12.2

ReportTitle 1997 Fraser selective salmon fisheries--final report

ProjectTitle	Beach seines
Author	J. O. Thomas
ReportDate	March 1998
ProjectYear	1997
Proponents	Katzie Indian Band; Fraser River Fishermen's Society
State	BC
Objectives	Test 2 beach seine nets, one conventional and one smaller and lighter.
Gear fishing time	beach seine set at high water because of the shallow site. Preferred
tide	was just prior to slack water when the tide was still rising. With such restricted fishing times, fishing can occur for only a few hours each day because a high
during that	would occur only once during daylight hours. One-three sets to be made
and	time. Sites further upriver such as at Chilliwack are not subject to tidal activity
Results were	Pink and chum runs had both passed by the time operational problems
other	overcome. Total catch = 24 chum & 15 pinks. Main problem was the constant presence of debris in the river at Derby Reach. Operations went much more smoothly once a concerted effort was made to drag the river for snags and
Conclusions heavier net but	the smaller, lighter net was easier to set and retrieve in the larger,
velocity of	was still prone to snagging and was more susceptible to tearing. Its use was abandoned after testing at Derby Reach and Chilliwack sites. Although the Chilliwack site is not affected by tidal action and has very few snags, the
to be	the current caused major difficulties. The current caused the punt and the net
This put	dragged down river, making setting and retrieving the net extremely difficult.
also	great strain on the net and damaged it. The mouth of the Stave River was
Recommendations	The Derby Reach beach seine site requires extensive clearing of

snags and debris
concentrate on sites similar to Derby Reach with slow-moving water that have been properly

Outcome Results inconclusive

Sector Alternate

SubSector Beach seine

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Report # 12.3
ReportTitle 1997 Fraser selective salmon fisheries--final report
ProjectTitle Fish Wheel
Author J. O. Thomas
ReportDate March 1998
ProjectYear 1997
Proponents ???

State	BC
Objectives species.	Test fish wheel for catch of target species and selectivity of non-target species.
Gear	fish wheel
Results caused	The fish wheel was only operated for one 17 hour period. After damage when it slipped its moorings and was carried downstream, operation was aborted.
Conclusions	No useful data collected.
Recommendations should include area on	The safety features of the fish wheel require improvement. This should include addition of handrails and safety lines as well as an organized and secure area on the work platform to conduct sampling and tagging activities.
Outcome	Needs further study
Sector	Alternate
SubSector	Fish wheel

Report # 13

ReportTitle 1994 Skeena fisheries resource technician program--operations summary

ProjectTitle

Author J. O. Thomas

ReportDate December 1994

ProjectYear 1994

Proponents Skeena Watershed Committee

State BC

Objectives sockeye and Mount an observer program to gather catch data aimed at optimizing pink salmon catch while minimizing harvest rates on coho and steelhead.

Gear sport fish verify and sample catches aboard commercial gillnet and seine vessels, creel census, spawner escapement enumerations, port sampling, support to

Results

Conclusions

Recommendations

Outcome

Sector

SubSector

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Report #	14
ReportTitle	1995 Skeena River gillnet and seine sampling program
ProjectTitle	
Author	J. O. Thomas

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sheries Management>Selective Fishing\

ReportDate March 1996

ProjectYear 1995

Proponents

State BC

Objectives

Gear

Results

Conclusions

Recommendations

Outcome

Sector

SubSector

Report # 15

ReportTitle 1996 Skeena selective gillnet fishing gear study

ProjectTitle NA

Author J. O. Thomas

ReportDate nd

ProjectYear 1996

Proponents NS

State BC

Objectives
steelhead but To modify gillnet gear as a means of reducing harvest of coho and
increasing harvest of sockeye.

Gear
ratio, 1.2 m 1. Standard normal 60 mesh net. 2. Alaska Twist 60 mesh net, 2:1 hang
weedline. 3. Alaska Twist 90 mesh net, 2:1 hang ratio, 1.2 m weedline. 4.
Alaska Twist 120 mesh net, 2:1 hang ratio, 1.2 m weedline.

Results
standard Results. All Alaska twist nets caught fewer steelhead than comparable
nets. CPUE for steelhead was dramatically lower for all Alaska twist nets
compared to the standard net. This result was not appear to be dependent on the depth
of the

CPUE than net. The Alaska twist 90 and 120 nets demonstrated significantly higher either the standard net were the Alaska twist 60 net for sockeye. There were pronounced regional differences (area 3 versus area 4) in sockeye catch success by net type and dimension. Catch of coho with Alaska twist 90 and 120 mesh can be more than double that of the standard net. This increase in coho bycatch is a problem given that the increase in sockeye catch in the Alaska twist 90 and 120 mesh nets is only 25%-40% as the depth of the Alaska twist nets increases, the proportional catch of coho increases much more rapidly than that of sockeye. There is clear evidence that coho were concentrated geographically in outside Area 3 and 4 fisheries. This result is consistent with the delayed run timing of Skeena River coho. Although all of the Alaska Twist net configurations resulted in a reduced bycatch of steelhead, and the deeper configurations also resulted in an increased catch of CPUE of sockeye, there is also a marked and very dramatic increase in the catch of

Conclusions caught fewer steelhead than standard net configurations. 1. Alaska Twist net configurations (all which incorporated a weedline) depth caught more sockeye than similar shallower nets. 2. Alaska Twist nets of greater greater depth caught more coho than similar shallower nets. 3. Alaska Twist nets of depth caught more coho than similar shallower nets. 4. The CPUE of coho was

Recommendations Coho catches could be reduced by adoption of daylight only fisheries. Further work is required to identify selectivity factors. For example, Alaska twist nets should be deployed with and without weed lines. 90 mesh nets constructed of standard web should be used. The effect of fouling of Alaska twist with plankton buildup on fishability needs further scrutiny. Gear specifications changed during the study because repairs to nets were not always completed using the same material as the original net. The effect of repairs on hang ratio, mesh size and the gauge and color of web was not assessed. Gillnet study participants violated agreed procedures for excepting observers and notifying of departures. Future studies should

explicitly articulate the penalty for non-compliance respecting deployment of observers.

Outcome Objectives met

Sector Gillnet

SubSector Alaska twist; weedline; day-night fishing

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Report # 16.1

ReportTitle 1997 Skeena selective fisheries studies--Summary

ProjectTitle 1997 Alaska Twist vs Standard Mesh Gillnet Study

Author J. O. Thomas

ReportDate February 1998

ProjectYear 1997

Proponents NS

State BC

Objectives traditional or to compare catch between newly approved Alaska twist mesh type vs

Gear and 4 data was collected by observing off-loads on-board packers in the Area 3

opening fishery and at processing plants in Masset during the Area 1 fishery, and by interviewing fishermen. The data were used to calculate average catch per

used to whereas the data in 1996 were collected on board individual gillnetters and

percent calculate catch per hour. 639 boats were interviewed over seven commercial openings spanning for weeks. 64 percent use standard 60 mesh net of 31

Results standard more configuration had were nets the Alaska Twist configuration caught more sockeye on average than the configuration for all areas combined. the Alaska Twist configuration caught coal on average than the standard configuration. The Alaska twist a worse sockeye to coho ratio than the standard configuration. few steelhead were captured during the 1997 study making conclusions about the selective even

Conclusions

Recommendations conclusion of the 1996 of they are The concern for coho bycatch needs to be addressed. One study was the coho catch could be reduced by restricting nighttime fishing opportunities. Confirmation of the selectivity of nets, especially when catches certain species are low (eg, steelhead) require that nets be monitored as

Outcome Objectives met

Sector Gillnet

SubSector Alaska twist; weedline

Report # 16.2

ReportTitle 1997 Skeena selective fisheries studies--Summary

ProjectTitle 1997 Seine coho mortality study

Author J. O. Thomas

ReportDate February 1998

ProjectYear 1997

Proponents NS

State BC

Objectives 5. to study the short-term survival of seine caught coho in areas 1,3,4 and 5.

Gear a tank
required to
observed
was

8 seine vessels were recruited for the study. Each was required to provide with recirculating water to keep fish alive for observation. Each was also take an observer during each opening for the study. Coho were taken and from normally occurring seine fisheries in areas 1,3,4 and 5. Each coho was individually tagged and observed for up to six hours. The method of capture was

Results 14 coho
mortality

450 sets observed; 496 coho caught; 400 coho tag, held and observed. DOA (3.5%); 79 coho died during the six-hour holding. (19.8%) 23.3% overall mortality. Mortality varied significantly among vessels. Primary causes of

Conclusions A small number of tag recoveries is a concern.

Recommendations coho should be
assessed. The effects of multiple recaptures should also be assessed,

especially for the Area 4 special seine fisheries.

Outcome Objectives met

Sector Seine

SubSector Post-capture survival

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Report # 16.3

ReportTitle 1997 Skeena selective fisheries studies--Summary

ProjectTitle 1997 QCI seine chinook encounter study

Author J. O. Thomas

ReportDate February 1998

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ProjectYear	1997
Proponents	NS
State	BC
Objectives other bycatch	To provide an objective accounting of encounter rates for chinook and species during QCI seine fisheries.
Gear The were well	An observer was placed on board seine vessels that were actively fishing. The observer oversaw only one set before moving on to another vessel. Data recorded one set location, time, trawl open set, and catch by species. The condition of chinook, coho and steelhead were noted prior to their release as well
Results sockeye = Beach open sets. rates and	44 sets by 29 vessels were observed over five fishing days. Total catch: 3,718; Pink = 2,447; chum = 164; coho = 75; chinook = 142; steelhead = 6. sets accounted for more sockeye, pink, chinook and coho on average an open sets. When more than 25 vessels are fishing in the area lineups for beach sets substantially reduce the total number of sets that can be made. Encounter rates and
Conclusions	
Recommendations being	A tagging program would be useful to determine if released fish are being recaptured and the condition of those fish upon recapture.
Outcome	Objectives met
Sector	Seine
SubSector	Catch and release monitoring

Report # 16.4

ReportTitle 1997 Skeena selective fisheries studies--Summary

ProjectTitle 1997 Area 4 special seine study

Author J. O. Thomas

ReportDate February 1998

ProjectYear 1997

Proponents NS

State BC

Objectives
seine fishery To provide an independent accounting of catch in the Area 4 special
species. with an emphasis on abundance and condition of released non-target
species.

Gear
morning A mobile group of observers was transported on the fishing grounds each
and distributed among the fishing vessels. Estimates of catch of sockeye,

pink and chum location	incidental species as well as exact counts of steelhead, coho, chinook and salmon and their condition at release were recorded. Also recorded were
Results 257; good Fish	442 sets were observed. Total catch: sockeye 20,423; pink 35,968; coho chinook 95; chum 1,269; steelhead 358. The percentage of fish released in health (vigorous and not leading) was high. Mortality rates were very low. released in good health: coho 74.3%; chinook 85.3%; steelhead 85.5%; chum
Conclusions (1.8%). Most were was a	Very few of the bycatch species were dead or died prior to release released in good condition (88.6%). The 1997 Area 4 special seine fishery success even though it was closed due to non-compliance.
Recommendations enforcement	Increasing observer coverage and/or responsibilities as well as options to allow tighter control of the fishery should be considered.
Outcome	Objectives met
Sector	Seine
SubSector	Catch and release monitoring

Report #	17
ReportTitle Bulkley	Creel survey of a pink and chinook salmon fishery at two locations on the
ProjectTitle	NA
Author	K. L. Morton
ReportDate	September 1998
ProjectYear	1998
Proponents	NS
State	BC
Objectives	
Gear	
Results	
Conclusions	
Recommendations	
Outcome	
Sector	Hook & Line
SubSector	Recreational

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Report #	18
ReportTitle gillnets	Experimental assessment of weedline-modified mono- and multi-filament
ProjectTitle	NA
Author	V. A. Lewynsky (Western Renewable Resources)
ReportDate	December 1992
ProjectYear	1992

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sheries Management>Selective Fishing\

CAN176467_0044

Proponents	DFO; MELP; MAFF
State	BC
Objectives incidental	To test the suitability of weedline-modified gillnets to selectively reduce harvest of steelhead trout in commercial fisheries while minimizing impacts on commercial sockeye salmon fisheries.
Gear net paired with	1.2 metre weedline-modified gillnet configurations using 60 and 90-mesh monofilament net webbing tested against conventional 60 mesh multifilament webbing currently in use in commercial fisheries. Experimental nets was a vessel fishing an identical net hung directly to the cork line (ie, without a
Results multifilament than the the ranged from sockeye	Nets with weed lines caught 65-70% less steelhead than the standard net. Monofilament nets without weed lines caught 35-40% less steelhead standard multifilament net. All monofilament nets caught more sockeye than standard multifilament net, with or without weed lines. Increased catch 10-40%. The multifilament standard net with the weedline caught 15% less than the standard multifilament net (without a weedline). Similar results were
Conclusions	none provided.
Recommendations	None provided.
Outcome	Needs further study
Sector	Gillnet
SubSector	Monofilament; weedline

Report # 19

ReportTitle 1997 Fraser River modified gillnet study--final report

ProjectTitle NA

Author J. O. Thomas

ReportDate March 1998

ProjectYear 1997

Proponents DFO; MAFF

State BC

Objectives
the net) and
ability To test gillnets with weed lines (larger mesh panels in the upper half of
standard mesh below the weedline against standard mesh nets to test their
to reduce or eliminate bycatch of steelhead, coho and chinook during chum

Gear
portions of the
a test
mesh size Selective fishing gear and methods. Three vessels fished different
Fraser River with nets of similar construction consisting of a control half and
half. Control mesh size ranged from 6.75" – 7.25" hung at 2.8-3.0:1. Test

Results or higher proportion of all halves of majority

The proportion of bycatch species in the test half of the net was the same than in the control half. Analysis showed no significant lowering of the bycatch in the test half of the net relative to the control half for any species or all species combined. The data do suggest that most steelhead are caught in the upper portion of the net; that coho are caught equally in the top and bottom the net; and that chinook are caught mainly in the lower half of the net. The

Conclusions reducing or bycatch portion size of net only chum all the this significantly lower.

Because most chum are caught in the bottom portion of the net, eliminating the catch of all species in the top portion of the net would reduce considerably, especially of steelhead which are mainly caught in the upper of the net. This may be achievable either by significantly increasing the mesh size of the top portion of the modified net or using a weedline. It may be possible to selectively catch chum by increasing the mesh size of the top portion of the slightly so that most of the bycatch species could pass through and only would be captured but this would be much more difficult than simply allowing fish to pass through the top portion of the net. Had this been done, data from this study indicate that only the proportion of steelhead would've been significantly lower.

Recommendations bycatch in the upper method of experimental Additional method test half accomplished by

1. Further modify the design of the net to reduce or eliminate portion of the net (increase mesh size or use weed lines). 2. Only one reducing bycatch should be used to reduce the complexity of the design. 3. All experimental nets should have the same specifications. 4. sources of funding should be investigated to eliminate the use of fish as a of payment for the study. 5. It may be possible to make the top portion of the of the net even deeper to further reduce bycatch. This could be varying the depth of the top panel of the net or more simply by recording the

depth at which each fish is captured. 6. If costs are not prohibitive, sample sizes could be

Outcome Objectives met

Sector Gillnet

SubSector Weed line

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Report # 20

ReportTitle 1997 Area 4 special seine study--summary report

ProjectTitle NA

Author J. O. Thomas

ReportDate nd

ProjectYear 1997

Proponents NS

State BC

Objectives Skeena River To reduce surplus escapement of sockeye and pink salmon to the chinook and while releasing alive and unharmed non-target species such as coho,

Gear being had to Seine fishery in which all sets had to be brailed and all fish sorted prior to placed in the hold. Only sockeye and pink could be kept -- all other species

be returned to the water with least possible harm. Vessels were required to hail into a designated fishery patrol vessel upon entering the grounds and prior to leaving the grounds. Vessels had to enter the fishery with no fish on-board and unload any fish before moving to another area to fish. Vessels had to take an observer on-board if requested to do so. Observers estimated catch of sockeye and pink salmon as well as other species including crabs, flounders, skates. Exact counts of coho, chinook, chum and steelhead salmon were recorded as the fish were removed from the rest

Results The 1996 seine release mortality study showed that the mortality rate of brailed fish is lower than mortality rate of fish retrieved over the stern or side of the vessel (4.5% versus 17.3% mortality). Despite the efforts of the observer program and DFO enforcement, the fishery was closed after the Aug. 12 opening due to lack of

Conclusions Of 1,862 nontarget fish observed, only 1.8% were dead were died prior to release; 88.6% were released back into the ocean in good health. These numbers indicate a successful fishery in spite of the fact that was closed due to noncompliance.

Recommendations 1. Consideration should be given to increasing observer coverage and possibly observer responsibilities in this fishery in the future. 2. Long-term effects of "infestations" of jellyfish on salmon should be done to determine the long-term

Outcome Objectives met

Sector Seine

SubSector Catch and release monitoring

Report #	21
ReportTitle	1997 Queen Charlotte Island seine chinook encounter study--summary report
ProjectTitle	NA
Author	J. O. Thomas
ReportDate	nd
ProjectYear	1997
Proponents	NS
State	BC
Objectives	Not specified in report.
Gear 1 seine counter revived	One observer was transported from vessel to vessel throughout the Area fleet to observe in report catch paying particular attention to chinook and rates. For coho, chinook and steelhead it was also noted whether they were in blue boxes prior to release and their condition upon release.
Results species boxes and chinook	Beach sets harvested greater average numbers of every Pacific salmon with the exception of steelhead. 23% of fish released were revived in blue boxes and 84% overall were released in healthy, vigorous condition. 87% of 142

blue- observed were released in healthy, vigorous condition. 45% of coho were
vigorous boxed prior to release; 77% of the coho catch was released in healthy,
the condition. Only six steelhead were observed; one was dead upon capture;

Conclusions Though it is often advantageous to release fish as soon as possible,
this may not be best when many boats are fishing in the same area. Fish released in a
busy fishery may simply be recaptured in the next set. The data show distinct
differences

Recommendations 1. A tag and release program would be useful to discover if
released fish are being re-caught and the condition of these fish upon recapture. 2. Use more
observers to record data for open and beach sets during all openings to better compare
these

Outcome Objectives met

Sector Seine

SubSector Catch and release monitoring

Report # 22

ReportTitle 1997 North Coast seine mortality study--summary report

ProjectTitle NA

Author J. O. Thomas

ReportDate nd

ProjectYear 1997

Proponents NS

State BC

Objectives survival rate of targeted of

In 1996, a mortality study was undertaken to determine the short-term survival rate of non-target species from the Area 4 selective seine fishery. The 1997 study targeted coho to determine the short-term mortality rate for fish caught under "normal" fishing conditions. The 1997 study investigated the short term mortality rates of

Gear participating in were and were salmon were River and recorded of the

Fishermen were asked to volunteer for the study with the incentive of an exclusive 212-hour opening later in the season as "payment". Volunteers were required to host an observer for the remainder of the regular seine season and were required to provide a holding tank for fish, a survival suit for the observer and accommodation for the observer. Coho, chinook, steelhead and chum salmon were collected from seines brailing in the river/gap/slough area of the Skeena River and transported to another platform to be studied for up to 48 hours. Data recorded included: area, date, time, duration and type of set (beach or open); method of retrieval (ramping, brailing, tilt stern) and, if brailed, the number of brails and the time to brail, use of blue box; estimated number of sockeye and pink in the

setand

Results
coho
observed
and scale

450 sets observed. 496 coho caught. Fourteen dead on arrival (3%). 400 tagged, held and observed in on-board tanks. 79 coho die during the six-hour holding period (19.8%). Overall mortality = 23%. Contrast with 7% mortality in 1996 special seine fishery study. Primary causes of mortality: crushing

Conclusions None specified in report.

Recommendations 1. Longer term mortality involving the effects of scale loss of released coho needs to be assessed. Minimal recoveries of tagged coho releases is of concern. 2. Multiple
special
recapture effects on coho need to be assessed for both conventional and

Outcome Objectives met

Sector Seine

SubSector Catch and release monitoring

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Report # 23

ReportTitle mesh gillnet	1997 North Coast gillnet observer program--Alaska twist and standard
ProjectTitle	NA
Author	J. O. Thomas
ReportDate	nd
ProjectYear	1997
Proponents	NS
State	BC
Objectives Alaska twist 90 net. In study.	One conclusion of the 1996 Skeena selective gillnet study was that mesh net incorporating a minimum 1.2 m weedline allowed for a high sockeye catch while reducing steelhead catch. That finding led to the approval of the 1997 Observer Program was organized to verify the findings of the 1996 study.
Gear commonly used nets were standard weedline	Alaska twist 90 mesh nets and standard 60 mesh nets were most commonly used by fishermen participating in this study. Fifty mesh and 90 mesh standard also encountered. Vessels were allowed to fish 90 mesh nets with either 30 filament or Alaska twist 6 filament, provided these nets had a minimum of 1.2 meters. Nets without a weedline were allowed a maximum depth of 60
Results higher sockeye 50% as coho steelhead catch standard	As expected from the 1996 study, Alaska twist nets consistently had higher catches and standard 60 mesh nets. On average Alaska twist nets caught 50% more sockeye per vessel and standard nets. Alaska twist nets caught twice as much coho as standard nets. This coho ratio held in Areas 3 and 4 that the catch by each net type was much closer in Area 1. Although data on steelhead catch are scanty (ie, few steelhead were caught by either net type) in most cases standard nets caught more steelhead and Alaska twist nets. The benefits of increased sockeye catches with the Alaska twist net are reduced when comparing

ratios of average sockeye to coho catches between the two net types since the
 Alaska twist

Conclusions Data collected in this study support the findings of the 1996 selective
 gillnet study. Alaska twist 90 mesh net out fished standard 60 mesh net 1.5:1 for sockeye
 and 3.2: 1 for coho (editor's note: the overall ratio for coho appears to be 2: 1; the
 3.2: 1

Recommendations None included in report.

Outcome Objectives met

Sector Gillnet

SubSector Alaska twist; weedline

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Report # 24

ReportTitle Report on cod trap selectivity workshop

ProjectTitle NA

Author Fisheries & Marine Institute

ReportDate June 1997

ProjectYear 1

Proponents

State

Objectives

Gear

Results

Conclusions

Recommendations

Outcome

Sector Alternate

SubSector Fish trap

Report # 25

ReportTitle 1996 seine release mortality study--final report

ProjectTitle NA

Author J. O. Thomas

ReportDate June 1997

ProjectYear 1996

Proponents NS

State BC

Objectives To quantify the short-term survival of steelhead, chinook and coho
captured in Areas 3, 4 and 5. A large proportion of the fish observed were taken from the Area
4 special seine fishery, a selective fishery occurring at the mouth of the Skeena River
to intercept surplus pink and sockeye salmon while releasing all steelhead,
chinook,

Gear Mandatory brailing all fish on to the deck for immediate sorting and
release, or released directly from the seine net with dipnets or other methods.

Acceptance of observers to monitor fishing and release activities. Provision of a blue box to
revive

no fish sets most
fish of. Hailing in and out to a fisheries patrol vessel. Entering the fishery with on-board and off loading all fish before proceeding to any other fisheries. All made during the Areas 3 seine charter employed some form of ramping while

Results - 45% 0% brailed thereafter.
Coho: to under 21 fish observed -- 5.9% mortality. Chinook: 20 observed - mortality. Steelhead: 133 observed -- 3.8% mortality. Chum: for observed -- mortality. For all species, mortality of ramped fish = 17.3% versus 4.5% for fish. Most of the mortalities were either dead on arrival or died shortly

Conclusions extremely low, higher than have 20% of this Pre- was when DFO scales fishing problem as
Observed mortality rates for steelhead and coho in this study were well below expectations. Although the mortality rate for chinook is much expected, the sample size was small and skewed towards juvenile fish which been observed to have higher mortality rates than larger chinook. Because mortalities occurred after six hours, mortalities could be underestimated in study because a significant number of fish were released after only six hours. variation in the experience and skills shown by fishermen when releasing fish observed. It was also observed that many fishermen alter their behavior representatives are on-board. Steelhead rarely lost any significant amount of but coho routinely lost 5-50% of their scales due to abrasion caused by operations and handling. Whether this amount of scale loss would be a

Recommendations the survival rate of non-releasing fish
1. Continue to practice of brailing in Area 4 special seine fisheries fish released from this fishery is high. Brailing facilitate sorting and release of target species. 2. The minimum length of time for observation before should be six hours. Future studies should retain fish for least six hours and preferably holding for least 24 hours. 3. To confirm long-term survival of fish released from the Area 4 special seine fishery a radio telemetry or large-scale

paying program should be implemented. For. A program to educate fishermen in the

Outcome Objectives met
Sector Seine
SubSector Brailing

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Report # 26.1
ReportTitle (1996) Evaluation of selective salmon fisheries in the lower Fraser River
ProjectTitle Tooth net
Author J. O. Thomas
ReportDate February 1997
ProjectYear 1996
Proponents Mark Petrunia

State BC

Objectives chum entangled size and a
A small mesh net was proposed as a method of selectively harvesting salmon in the Fraser River. Fishing countering the net would become (primarily by the lower jaw) as opposed to being the old as occurs with the traditionally-dimensioned chum gillnet which would have a mesh size of approximately 7 inches. Although the net would not be selective in terms of species of fish caught, non-target species could be returned to the water with

Gear demonstrated would be was construct the pounds the vessel net. The weekly. chum

Limited preliminary testing in 1995 using a 1 3/8 inch eulachon net that chum could be caught using this method but that a larger mesh size required. In this study a 3 1/2 inch mesh net on 3:1 and 120 meshes deep tested during the early chum run on the Fraser River. The web used to net was 32 strand No. 19 line, 100 fathoms in length. The lead line was 1.3 per fathoms (total 59 kg). The net was set by freewheeling off the drum as was driven forward in a continuous S. pattern to create loose bags in the net was allowed to soak for 20 minutes from the time of starting the set until beginning of retrieval. A chum allocation of 3,000 pieces was apportioned Fishing was permitted up to four days per calendar week. All fish other than

Results sets were coho caught -- 27

Sets just prior to or at slack water were the most productive. Flood tide more productive than ebb tide sets. Dark sets produced more chum and less than daytime sets. Coho: 588 caught -- 87.8% released alive. Chinook: 88 97.7% released alive. Steelhead: 32 caught -- 100% released live. Sockeye:

Conclusions predation by chinook net to fish times fish the fine separately from

Mortalities were attributed to two causes. The primary cause was seals. Still predation accounted for 66 of 72 coho mortalities (91.7%) and all and sockeye mortalities. The secondary cause of mortality was the net. The accounted for six of 72 coho mortalities (8.3%). No mortalities were attributed handling. Mortalities caused by the net were minimal due to 20 minutes at and away fish were captured by the net (ie, by tangling). The vast majority of were caught by the teeth on the lower jaw being snagged on the net. Due to mesh and hang ratio, if the upper jaw was also caught, it was tangle

Recommendations cautious for use

1. The short set time used in this study may be perceived as overly

to in a commercial fishery. Some experimentation with set time may be required
tooth net determine maximum fishing efficiency while maintaining minimal net and seal
water mortality rates. 2. The results of this study indicate that fish caught using a
investigate using short sets are in very good condition and most can be returned to the
fishery. Such immediately or after a short recuperative period. Most fish exhibited little or no
Because physical damage or scale loss from the net. Further evaluations should
particularlly the probability and effects of multiple captures of individual fish within a
should studies should simulate commercial openings as closely as possible. 3.
ability to tooth nets are not selective by species, their use for commercial fishing,
than during times when stocks or species of concern are likely to be intercepted,
require a second person on-board to release non-target species. 4. The
commercial fisheries such as mark-recapture population estimates and brood

Outcome Objectives met

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SubSector Tooth net

Report # 26.1

much lower mortality rate and with a conventional gillnet.

prohibited. salmon were to be released unharmed. Sorting or discarding chum was

caught -- 96.3% released live.

degree. the lower jaw so the most could be opened and closed, at least two limited

stock capture. The utility of tooth nets for other purposes should be explored.

Report # 26.2
 ReportTitle (1996) Evaluation of selective salmon fisheries in the lower Fraser River
 ProjectTitle Beach seines
 Author J. O. Thomas
 ReportDate February 1997
 ProjectYear 1996
 Proponents Katzie Indian Band; Fraser River Fishermen's Society

State BC

Objectives the Fraser was This project was an attempt to selectively harvest only chum salmon in the Fraser River. By modifying a seine net to fish in the shallow waters of the River, it was theorized that non-target species of salmon could be released in much better

Gear conventional consisting of sections length lead line per foot. A 10 target The net was a modified commercial seine net, much larger than a beach seine (which more closely resembles a commercial gillnet than a commercial seine net). The net was approximately 150 fathoms long three 50 fathoms sections. The centre section was 60 feet deep; the end were 40 feet deep. The lead line was 8 pounds per foot throughout the entire of net. The way to the net made it difficult to toe and therefore 50 fathoms of near the centre of the net was replaced with lead line weighing for pounds herring/salmon punt was used to set and retrieve the net. The minimum of 8-10 people were required to fish the net; at times grew size reached 15. Non-

in the species were released from the beach seine as soon as they were identified
required net when the set was dried up. Although most fish were vigorous, some
number resuscitation and were revived by short grew as time permitted. Due to the

Results Some of the fish captured in the beach seine appeared to be stressed and
appeared to somewhat sluggish but there was little if any physical trauma to the fish. The
number majority of fish released from the beach seine were coho; the process
poor be very successful. There was only one mortality during the course of this
debris experiment (a coho) and it appeared to be precipitated by a seal attack. The
and often of chum salmon caught was extremely low. This was thought to be due to
returns to the Fraser River in 1996. The main problem encountered during the
experiment was the constant presence of snags consisting of large pieces of
such as logs and stumps. These would cause delays in retrieving the net

Conclusions None listed in document.

Recommendations 1. Short term survival of fish caught by a beach seine needs further
investigation.
study, Although there were no net mortalities observed during the course of the
active many fish were released in a lethargic state. While fish that are vigorous and
observe if can and should immediately be released, lethargic fish should be held to
tote any mortalities occur. This could be accomplished with a net pen or a large

Outcome Objectives met

Sector Alternate

SubSector Beach seine

Report # 27.02

ReportTitle Selective Fisheries Program--Modified and Alternate Gear & Methods

ProjectTitle Power-Assisted Fish Wheel

Author Triton Environmental Consultants Ltd

ReportDate December 1998

ProjectYear 1998

Proponents Lakahahmen First Nation/Fraser River Fishermen Society

State BC

Objectives systems might turn the harvest,
The objective of this experiment is, in part, to test how power assist be used to allow fish wheels to operate in areas with insufficient current to wheel alone. This wheel is also intended for use in stock assessment,

Gear in 1998, installed to on-shore approaching
The wheel would be the largest of those proposed or tested on the Fraser with four baskets 4 m wide by 4 m deep, framed in aluminum pipe. It will be mounted on 12 m pontoons, 3 m wide and 3 m deep. A lead net will be direct fish towards the wheel. Power will be supplied by hydraulics from an power source to decrease the noise level, which might deter fish from

Results was
This proposal was approved in October 98 and construction of the wheel begun. In December 98, construction was still underway.

Conclusions

Recommendations

Outcome Results inconclusive

Sector Alternate

SubSector Fish wheel

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Report # 27.03

ReportTitle Selective Fisheries Program--Modified and Alternate Gear & Methods

ProjectTitle Skway First Nation Fish Wheel

Author Triton Environmental Consultants Ltd

ReportDate December 1998

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Management\Gordon Curry\Cohen - Gord Curry\2005\Fi
sheries Management>Selective Fishing\

ProjectYear	1998
Proponents	Skway First Nation; UBC; BC Ministry of Environment, Lands & Parks
State	BC
Objectives chum for radio and	The wheel was intended both to provide for the harvest of sockeye and food, social and ceremonial purposes, and also provide a means to apply tags to steelhead and obtain relevant biological information on this species
Gear baskets the holding slough and, When	The Skway wheel is slightly smaller than the Yale Wheel overall, with four about 3.5 m wide by 3 m deep hung with knotless seine webbing. It is pontoon mounted on a frame that can be raised and lowered to adjust the elevation of baskets relative to the water. Fish are directed, after capture, into one of two boxes mounted to the outside of the pontoons. This wheel was built in a slough and, using an outboard motor, was moved to the fishing site under its own power.
Results coho, 3 others	Total catch to October 25 was 4 sockeye, 186 chum, 36 chinook, 505 steelhead and 1 sturgeon (4 sockeye, 158 chum and 1 chinook were kept; all others
Conclusions rectified.	There were a range of structural problems with the wheel that will be rectified. Overall, this wheel was considered a success, overall, in the capture and live
Recommendations	None listed in document.
Outcome	Results inconclusive
Sector	Alternate
SubSector	Fish wheel

Report # 27.08

ReportTitle Selective Fisheries Program--Modified and Alternate Gear & Methods

ProjectTitle Tsumura/Godin drift trapnet

Author Triton Environmental Consultants Ltd

ReportDate December 1998

ProjectYear 1998

Proponents Tsumura/Godin

State BC

Objectives research since Objectives. To test free floating trap nets used in lakes for fisheries the late 1960s as a viable selective fishery alternative to the gillnet.

Gear gillnet but with Selective fishing gear and methods. The lead net is to be set like the

Many fish a floating trap replacing the hook normally put into the outside of the set.
around its escape a conventional gillnet by swimming along the net and escaping
in outside edge. This trap as designed to capture fish that would've been killed
those that would've escaped. The trap has a single heart with lead wings into

Results No results that time of writing this report

Conclusions None offered in paper.

Recommendations None offered in paper.

Outcome Results inconclusive

Sector Alternate

SubSector Fish trap

Report # 27.13

ReportTitle Selective Fisheries Program--Modified and Alternate Gear & Methods

ProjectTitle Matsqui First Nation selective release beach seine

Author Triton Environmental Consultants Ltd

ReportDate December 1998

ProjectYear 1998

Proponents Matsqui First Nation

State BC

Objectives species. To test a beach seine and the selectiveness of releasing non target species.

Gear Beach seine

Results salmon were Results. In the four fishing days of the project, 34 chum and two coho released in good condition. Due to unmanageable he high downstream velocities when the tide was ebbing, sets can only be made when the tide was in flood.

Conclusions None offered in paper.

Recommendations None offered in paper.

Outcome Needs further study

Sector Alternate

SubSector Beach seine

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Report #	27.14
ReportTitle	Selective Fisheries Program--Modified and Alternate Gear & Methods
ProjectTitle	Tzeachten Band section 35 beach seine fishery
Author	Triton Environmental Consultants Ltd
ReportDate	December 1998
ProjectYear	1
Proponents	Tzeachten Band
State	BC

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Management\Gordon Curry\Cohen - Gord Curry\2005\Fi
sheries Management>Selective Fishing\

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Objectives	NS
Gear	Beach seine 500 feet in length by 25-30 feet deep; 2.5 inch mesh
Results	Data on fish caught and released are presented in the report
Conclusions	Okay
Recommendations	None offered in paper.
Outcome	Needs further study
Sector	Alternate
SubSector	Beach seine

Report # 27.17

ReportTitle Selective Fisheries Program--Modified and Alternate Gear & Methods

ProjectTitle Impellerless seine fish pump

Author Triton Environmental Consultants Ltd

ReportDate December 1998

ProjectYear 1

Proponents Sechelt First Nation

State BC

Objectives industry against fishery. Objectives. To test an impellerless fish pump from the aquaculture industry against a wet brailer for removal of fish from a seine net in a selective mixed stock fishery.

Gear inch barges were Sechelt Inlet. barges of coho cortisol). Selective fishing gear and methods. An impellerless fish pump with an eight inch hose and a wet brailer with a 3500 pound capacity were borrowed from the aquaculture industry for use in this project. The equipment was mounted onto barges the were also equipped with a grading and sorting system. The barges were more in at the MacLean Bay Hatchery sea pen operation at the head of Sechelt Inlet. The commercial seine vessel made a set and powered the catch to the barges where fish were removed with the pump and the wet brailer. The subsample were tested for blood chemistry for stress indicators (sodium, glucose cortisol).

Results completed. One Results. At the time of writing this report to blood results have not been completed. Survival rates from the pump and a wet brailer were essentially the same.

stream advantage of the pump was that fish arrived on the sorting table in a steady stream

Conclusions None offered in paper.
Recommendations None offered in paper.
Outcome Objectives met
Sector Seine
SubSector Silkstream pump

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Report # 28
ReportTitle Live capture technologies for Pacific salmon
ProjectTitle NA

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Management\Gordon Curry\Cohen - Gord Curry\2005\Fi
sheries Management>Selective Fishing\

Author Triton Environmental Consultants Ltd
ReportDate nd
ProjectYear 1
Proponents
State BC
Objectives
Gear
Results
Conclusions
Recommendations
Outcome
Sector
SubSector

Report # 29

ReportTitle T'sou-ke First Nation salmon trap development program--background;
1995-96

ProjectTitle NA

Author NA

ReportDate nd

ProjectYear 1995

Proponents

State BC

Objectives

Gear

Results

Conclusions

Recommendations

Outcome

Sector

SubSector

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Report #	30
ReportTitle	The commercial salmon trap nets of British Columbia, 1894-1958
ProjectTitle	NA

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Management\Gordon Curry\Cohen - Gord Curry\2005\Fi
sheries Management>Selective Fishing\

Author Gordon Curry

ReportDate nd

ProjectYear 1

Proponents

State BC

Objectives

Gear

Results

Conclusions

Recommendations

Outcome

Sector

SubSector

Report # 31
ReportTitle Reef net technology of the salt water people
ProjectTitle NA
Author Eric Claxton Sr
ReportDate nd
ProjectYear 1
Proponents
State BC
Objectives
Gear
Results
Conclusions
Recommendations
Outcome
Sector

SubSector

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Report #	32
ReportTitle	1995 fishwheel project on the Nass River, BC
ProjectTitle	NA
Author	M. R. Link

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Management\Gordon Curry\Cohen - Gord Curry\2005\Fi
sheries Management>Selective Fishing\

ReportDate June 1995

ProjectYear 1995

Proponents

State BC

Objectives

Gear

Results

Conclusions

Recommendations

Outcome

Sector

SubSector

Report # 33

ReportTitle 1993 fishwheel project on the Nass River and an evaluation of fishwheels as an in-

ProjectTitle NA

Author M. R. Link

ReportDate March 1994

ProjectYear 1993

Proponents

State BC

Objectives

Gear

Results

Conclusions

Recommendations

Outcome

Sector

SubSector

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Report #	34
ReportTitle salmon and	Towards sustainable fisheries: balancing conservation and use of
ProjectTitle	NA

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Management\Gordon Curry\Cohen - Gord Curry\2005\Fi
sheries Management>Selective Fishing\

Author Sustainable Fisheries Foundation
ReportDate April 1996
ProjectYear 1
Proponents Sustainable Fisheries Foundation

State

Objectives

Gear

Results

Conclusions

Recommendations

Outcome

Sector

SubSector

Report # 35

ReportTitle

ProjectTitle Fish Wheel

Author

ReportDate

ProjectYear 1

Proponents Gitksan Wet'suweten'en Watershed Authority

State BC

Objectives years, and The Gitksa'an have operated a fishwheel in the Babine for a number of
Mainstem. submitted a proposal in 1998 for the installation of a wheel in the Skeena
approved. In The wheel would target sockeye and pink. In October this project was

Gear

Results

Conclusions

Recommendations

Outcome Results inconclusive

Sector

SubSector

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Report # 36

ReportTitle

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Management\Gordon Curry\Cohen - Gord Curry\2005\Fi
sheries Management>Selective Fishing\

ProjectTitle	Fish Wheel
Author	
ReportDate	
ProjectYear	1
Proponents	Skeena Fisheries Commission
State	BC
Objectives the (Skeena sockeye, 522 caught coho	The Skeena Fisheries Commission has been working with fishwheels in Kitselas Canyon for 5 years. This year, two wheels operated in the canyon River, above Terrace) from Aug 19 to Oct 09 for a total catch of 1779 coho, 2968 pink, 286 chum, 3 chinook and 190 steelhead. The wheel also 887 Jack sockeye and 901 other species including trout ,char, and eels. All
Gear	Two fish wheels.
Results and 190 utilized	Total catch of 1779 sockeye, 522 coho, 2968 pink, 286 chum, 3 chinook steelhead. The wheel also caught 887 Jack sockeye and 901 other species including trout ,char, and eels. All coho were released and the sockeye were
Conclusions	
Recommendations	
Outcome	Results inconclusive
Sector	
SubSector	

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Report #	37
ReportTitle	Northern gillnet upper Skeena coho mapping survey -- Final Report
ProjectTitle	NA
Author	Community Fisheries Development Center
ReportDate	NS
ProjectYear	1999
Proponents United	Native Brotherhood of British Columbia; Northern Gillnet Association;
State	BC
Objectives Area 4 fleet to	Objectives: the object of the survey was to map warm and cold spots in (Skeena). Information gathered would be used to allow the Area C gillnet

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sheries Management>Selective Fishing\

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future target Skeena sockeye and pink salmon well avoiding upper Skeena coho in
rise fisheries. The survey was also intended to provide better data on when coho
survey was and descend, to measure foregone catch in dark and morning sets. The
caught designed to provide data on whether there are differences in where coho or
composition in the net, especially in river, and to provide more per size coho stock
appropriate data to information. Finally, the survey was intended to provide DFO with

Gear Selective fishing gear and method. 40 boats in 10 groups to fish for two
consecutive periods of five days. All fish captured would be released alive, if possible.
Each vessel would carry an observer to record catch rates, fish condition at
release, time and location of sets, and take DNA samples. Revival boxes reused by all
fishermen to ensure fish returned to the water were in a condition that would allow them
every

Results Results. Coho encounters were primarily made by vessels fishing the
most westerly waters of the "outside" area. Raw data was provided to DFO electronic form.
At the time of writing his report the data had not yet been analyzed.

Conclusions Conclusions. Deferred until analysis of data is completed.

Recommendations Recommendations. 1. Complete data analysis as soon as possible
including DNA analysis and have the information made public prior to developing fishing
plans for the 2000 salmon season. 2. Use the data gathered in 1999 as a baseline and
encounter continue the project in 2000 to validate the findings of the survey (the coho
from the tax rate in 1999 may be low to low returns of sockeye). 3. Fund test vessels

Outcome Data not yet analyzed

Sector Gillnet

SubSector Mapping

Report # 38

ReportTitle Haisla selective reef net Report -- 1998 chum fishery.

ProjectTitle NA

Author Mark Bowler

ReportDate nd

ProjectYear 1998

Proponents Haisla Fisheries Commission

State BC

Objectives best practices Integrate the protect
Objectives. 1. Build and set a selective fishing device to demonstrate in terminal fisheries. 2. Assess training needs to effectively fish a net trap in a terminal area. 3. Build credibility and partnerships with key user groups. 4. facets of the fishery from capture to market to allow transport, processing, distribution and wholesale sale partnerships to demonstrate best practices in the utilization of fisheries as a renewal resource. 5. Establish methodologies to

	weak mix stocks and endangered strains. 6. Implement the Haisla Fisheries
Gear from among	A single ramp type net trap that delivers fish to Final cage was chosen a number of designs.
Results catching about to make haul-well the trap needed effect on plankton When it was	Results. The net trap immediately began to catch fish. The trap was two hundred chum per day and a few coho. Some modifications were made it fish better. There was a threshold number of fish needed to justify a live-boat trip. Holding a fish in the cage portion of the trap presented a problem: could not be fished when it was being brailed and it could not be brailed if no processing or transport boat was available. A second cage for holding fish to be constructed. There was also a problem of dissolved oxygen and its the health of caged fish. Sunlight and temperature effects in August caused blooms jeopardizing live transport of the catch to the processing plant.
Conclusions great promise found the trap little	Conclusions. As a method of harvesting selectively, the trap showed especially in areas were weak stocks require selective fishing. The trap was be relatively easy to work, affordable and manageable. In fact, product from when live-processed and well-handled was in demand even when there was
Recommendations	None in document
Outcome	Needs further study
Sector	Alternate
SubSector	Fish trap

Report # 39

ReportTitle Selective fish harvest devices for use on the Skeena River

ProjectTitle NA

Author Wilfred H. McKenzie

ReportDate January 1999

ProjectYear 1998

Proponents Kitselas First Nation

State BC

Objectives Skeena River as depressed harvest of class alive Department of traps would be Objective. To develop an improved fish wheel design for use on the Skeena River as an option for replacing use of salmon gillnets during migration period of depressed stocks (eg, upper Skeena coho salmon). Live capture of fish also allows surplus or under-sized males without harvest of egg-bearing females (eg, jack sockeye). The quality of salmon harvested in fish trap or fish wheel is first-class since the flesh of the fish is not damage from netting and the fish can be kept alive for tagging and other scientific purposes that may be required by the Department of Fisheries and Oceans. The use of selective harvesting methods such as fish traps and fish wheels allows for fishing during times when traditional net fishing would be closed. Additional objectives include: 1. Improved rotating basket design. 2.

live design trap	Improved maneuverability and catchability by modifying collapsible baskets, tanks and workspace. 3. Investigate feasibility of floating fish traps and
Gear design and a	Selective fishing gear and methods. Two fish wheels, one of original
of what	second, experimental wheel with all-aluminum-constructed folding fish wheel baskets with new design live tanks. The original design have baskets made
made	that did not stand up to strong water flows; the new design employed baskets
the	of aluminum pipe. Both designs used "G. clamps" to allow easy assembly of
damage to	fish wheel at a remote site. Knotless webbing in all baskets to minimize
Plastic	fish caught in the wheel. High-tension aircraft cable to stiffen basket ribbing.
rotate in	plugs at the ends of the aluminum piping to reduce noise as the baskets
wide	the water. New axles. Baskets of different widths: 1 fish wheel had eight-foot
New tow	baskets; the other 10 ft. wide baskets. Safety railings added to pontoons.
wide	points were added to pontoons to allow for better control of the fish wheel
outside of the	being towed. Modified live boxes so that they could be attached to the
Results	Raw data included in report
Conclusions address	Conclusions. Specific problems encountered and recommendations to address these problems are included in the report.
Recommendations	
Outcome	Needs further study
Sector	Alternate
SubSector	Fish wheel

Report # 40.1

ReportTitle gear Mortality comparison between water line versus revival tank release and gear

ProjectTitle Release method mortality study

Author Archipelago Marine Research

ReportDate nd

ProjectYear 1

Proponents Gulf Trollers' Association

State BC

Objectives higher coho experiments were Objectives. 1. To determine whether coho released at the water line had survival than those brought aboard vessels and placed in revival tanks. The mortality comparison experiment was the primary focus of the study with gear selectivity being a secondary objective. Two mortality comparison experiments were scheduled to take place, one during the sockeye fishery and one during chum

Gear cage to a the Selective fishing gear and methods. In each mortality experiment 4 vessels participated, 2 equipped with revival tanks and 2 equipped with a suspended cage towed along side the vessel. Fish were removed from revival tanks in cages nearby net pen separated into two sections. Fish were held overnight prior to release with a maximum holding time of 24 hours. All live coho were released

Results data Results-mortality comparison. The mortality comparison study is based on

collected from tests #1 and #3. Total salmon catch by species for each test is reported in the study document. Data on condition of coho that time of encounter are reported in Table 6 (p. 13). Net pen delivery and release data for tank vessels are presented in Table 7 (p. 14). Net pen delivery and release data for cage vessels is presented in Table 8 (p. 15). Total coho mortality results are presented in Table 9 (p. 16). Mortality associated with revival tanks was 12.6% while mortality associated with cages was 10.2%. Overall mortality was slightly higher than these figures as

Conclusions. The study showed a lower overall mortality rate for fish released at the water line than for those brought on board and placed in revival tanks. The study was conducted in a controlled environment; results need to be verified in a commercial fishery. Participants in the study expressed concern over fish handling procedures during the test compared to what they would've been during the commercial fishery. Fish were subject to considerable handling as a consequence of obtaining data for the study. Since handling likely increased coho mortality during this test fishery, it will likely have an even greater impact during a commercial fishery when handling practices are not up to the standards been used during a test fishery. This will be extremely evident if large numbers of coho are encountered and tank capacity is quickly reached. The best way to decrease the mortality rate of incidental coho bycatch may be to release them as quickly as possible at the water line. Revival tanks likely have a place in the recovery of bycatch but it may be only for fish assessed as condition 3 or 4. For such fish, it may be worth the time and effort to attempt to improve fish condition prior to release. The overall coho mortality rate for all three experiments was 10.4%, ranging from a lower 10.0% for test #1 to

Recommendations. 1. Studies of the effectiveness of revival tanks need to be continued. Such study should account for the condition of fish. Study should be conducted on the benefits to fish in excellent condition at time of capture

compared to those in poor condition. By examining how vigorous non-bleeding fish respond to revival tanks compared to those in poor condition, overall mortality may be decreased. 2. Flexibility in release procedures for prohibited species should be allowed. Water line release should be permitted under certain conditions (eg,

Outcome Objectives met

Sector Hook & Line
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Report # 40.1

fishery.

morning following the date of capture.

tanks, some fish were assessed as dead at the time of capture or not placed in

cages or the net pen.

higher 14.2% for test #3. This mortality rate is lower than figures for previous mortality studies conducted for the troll fishery.

fishing good condition, no predators in area).

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Report #	40.2
ReportTitle gear	Mortality comparison between water line versus revival tank release and
ProjectTitle	Gear catchability and encounter study

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sheries Management>Selective Fishing\

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Author	Archipelago Marine Research
ReportDate	nd
ProjectYear	1
Proponents	Gulf Trollers' Association
State	BC
Objectives reducing the during	2. To assess whether the use of "red gear" would be effective in encounter rate of coho. The gear selectivity test was scheduled to take place
Gear cage to a the	Selective fishing gear and methods. In each mortality experiment 4 vessels participated, 2 equipped with revival tanks and 2 equipped with a suspended towed along side the vessel. Fish were removed from revival tanks in cages nearby net pen separated into two sections. Fish were held overnight prior to release with a maximum holding time of 24 hours. All live coho were released
Results comparison is species are catching reducing be affect	Results-gear selectivity. The gear selectivity and hooking location based on data from all three tests. Data on catch rates by gear types in presented in Table 10 (p. 17). Red gear proved to be more effective for sockeye, pink and chum salmon but did not seem particularly effective in coho catch. Coho catch with red gear was lower than with coho gear of the difference was not statistically significant. The catch rate of coho seemed to related to the area fished rather than gear. Trolling speed also seemed to coho bycatch (higher speeds resulting in higher coho bycatch). Data on hope
Conclusions conclusive rates of of the	Comparisons of the selectivity of coho and red gear are by no means because of the many factors that influence fishing effort and success. Catch coho were higher using coho gear the differences were not significant for any test periods. Red gear proved to be much more effective in targeting chum

salmon during the final test. And resulted in higher catch a pink salmon during each test. Comparison of the sockeye catch was difficult to determine due to poor catch results

Recommendations 1. Some areas have extremely high numbers of coho present during certain times of the year (for example, Area 12-26 is an area of high coho abundance in late July to early August in should be avoided). The most effective method of reducing coho encounters is to adopt selective fishing strategies based on fishing areas with low coho abundance and avoiding areas where there are high coho concentrations. To do this is necessary to have pre-fishery knowledge of stocks present in the area of harvest. To determine pre-fishery harvest, test fishing should be continued. 2. Realistic and acceptable limits should be placed on coho bycatch and should factor in up-to-date and accurate mortality rates. By knowing what bycatch limits exist prior

Outcome	Objectives met
Sector	Hook & Line
SubSector	Commercial troll

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Report #	41
ReportTitle	Alternate handling methods for mixed stock fishery -- a pilot study
ProjectTitle	NA

Author	D. J. Bates and S. Quinn
ReportDate	March 1999
ProjectYear	1998
Proponents	Sechelt Indian Band; Target Marine; Ocean Fisheries
State	BC
Objectives in the west salmonids in a	Objective. To test handling methods and equipment currently employed coast aquaculture industry as a means of handling and sorting adult
Gear using a chum, Bay the metres to pump,	Selective fishing gear and methods. A 20 meter commercial seine vessel 220 fathom by 3.5 strip net with a 2 metre knotted mesh bunt harvested adult chinook and coho salmon in MacLean Bay as they returned to the MacLean hatchery. Once person was completed, the crew dried up the net alongside vessel. Captured fish were then powered inside the net approximately 150 the MacLean Bay sea pen location. Two barges equipped with a Silkstream
Results fishing method 9). The Mortality during Silkstream fish were	Results. Data on the number of fish caught by species and selective (Silkstream pump, wet brailer, control group) are presented in the report (p. qualitative assessment of all fish handled revealed little to know scale loss. during exercise was insignificant with only one fish dying after being injured the drying of the net. Large chinook salmon could not move through the pump and were removed by dipnet. Stress sampling showed little change in plasma stress indicators. Plasma sodium concentrations also showed no significant differences between selective fishing methods indicating that the were subjected to minimal stress during this exercise. Significant differences
Conclusions	Conclusions. This project demonstrated that fish could be handled and

sorted with
handled
scale
survival and

the pump/brail and three stage sorting system. Based on the limited data presented, it appears that the system does provide stressful conditions for fish. What has yet to be determined is the efficiency of the system for larger operations and effects on fish further from maturation, as well as their

Recommendations
evaluate the impacts
should be
further
maturation. No
fish once

Recommendations. Future studies require larger catches to evaluate the impacts on survival of pumping or brailing fish. Intake poses on the pump system adequate to handle larger chinook salmon. The impacts of fish condition that capture and of the holding facility on the results of this experiment need investigation. Future studies should include fish that are further from maturation. No attempt was made in this experiment to determine the survival of handled fish once

Outcome Objectives met

Sector Seine

SubSector Silkstream pump

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Report # 42

ReportTitle 1998 Fraser River Fishermen Society fish trap -- final report

ProjectTitle NA

Author	J. O. Thomas
ReportDate	March 1999
ProjectYear	1998
Proponents	Fraser River Fishermen Society
State	BC
Objectives allow live species.	Objectives. To test of fish trap as a new method of fishing that would capture and release of bycatch species while still allowing harvest of target species.
Gear could be lowered back trap to by to 34 1/2-inch	Selective fishing gear and methods. A floating fish trap with a net pen that raised out of the water when the trap needed to be checked and then lowered back into the water to resume fishing. The front of the net pen had a small tapered opening to allow fish to enter. Lead nets were set out from the front of the trap to force fish to swim into it. The trap was built on a wooden platform supported by 34 foot aluminum pontoons. The net portion of the trap was an aluminum cage measuring 16 feet long by 10 feet wide by 10 feet deep, covered with soft, 1/2-inch
Results catch was necessarily by	Results. Only three salmon were, during the entire experiment. Lack of catch was presumably due to low abundance of salmon during testing and not necessarily by
Conclusions two factors: its release during the efficiency in	Conclusions. The success of the trap will ultimately be determined by its ability to capture target species of salmon and its ability to successfully live release non-target, bycatch species of salmon. Due to the near total lack of catch during the operation of the fish trap, no conclusions could be made regarding its efficiency in catching chum salmon or in successfully releasing non-target species. Modifications may have to be made to the trap to increase its effectiveness in catching fish. The proponents have already considered adding a bottom net between the two lead nets to prevent fish swimming under the trap.
Alterations	Alterations might also be made to the tapering at the most of the trap to make it more

gradual so that it is easier for fish to enter the trap. Modifications may be made to facilitate live release of fish. Increasing accessibility to fish in the trap may need to be ensured as handling and stress to the fish must be kept to a minimum to ensure successful release. Another factor to be considered is the effect of the loading rate of the trap on the success of release. As more fish are introduced into the trap, the added crowding may lead to more stress on the fish. It will also increase the difficulty in identifying and releasing bycatch species that are present in the trap. It may be

Recommendations Recommendations. One. The trap must be fished at the time and in an area where there will be both target and non-target species present to assess its effectiveness. Its ability to capture target species and its ability to successfully live release bycatch species needs to be assessed. This could be accomplished during sockeye and pink fisheries when significant numbers of chinook are present in the river or during earlier-timed chum fisheries when coho and steelhead are prevalent. 2. The effect that the loading rate of the trap has on the survival of bycatch species should be investigated. Although it may be difficult or impossible to prove that the mortality of bycatch increases as the number of fish that are captured in the trap increases within the scope of this project, other measurements and subjective factors can be noted (eg, the length of time that the fish in the trap are "dried up" before all of the bycatch species are released as well as the condition of each release). These

Outcome Results inconclusive

Sector Alternate

SubSector Fish trap

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Report # 42

knotless webbing.

the failure of the trap's design.

bycatch necessary to monitor and adjust loading rates to maximize the success of species release.

observations can at least be correlated back to the number of fish that were captured in the trap at that time.

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Report #	43
ReportTitle	1998 Fraser River modified gillnet study -- final report
ProjectTitle	NA
Author	J. O. Thomas
ReportDate	March 1999
ProjectYear	1998
Proponents	Paul Kandt; Fraser River Modified Gillnet Working Group
State	BC
Objectives results of mesh to avoid	Objectives. Following the 1997 Fraser River modified gillnet study, the which were inconclusive, the 1998 study was intended to test even larger sizes in the upper portions of gillnets targeting on chum salmon and hoping

based on
mainly in
travel
of
net

coho, chinook and especially steelhead. The design of the study it was the assumption that chum travel lower in the water column and are caught the lower portion of gillnets while bycatch species (especially steelhead) higher in the water column and are predominantly caught in the upper portion of gillnets. A gillnet design intended to reduce catching the upper portion of the

Gear
by 4
three
1998. The
consisted of
was
panels were

mesh
every
mesh net
(individual
began)
height of
exactly

Results
coho, 6
gillnet study
and the
Fraser

Selective fishing gear and methods. 3 nets were constructed and tested vessels. Each net consisted of a test half and a control half and were fish for sets per day, for three days each week, for three weeks during November, control half of each net was a traditional configuration but the test half an upper panel of a very large mesh or no mesh at all, and a lower panel that the same as the control half. The two variables that varied between the mesh size and hang ratio. The traditional or control halves of each net were constructed of webbing with 7 inch mesh and a 3:1 hang ratio. The very large used in the upper portion of the test half of each net was created by cutting every second mesh of a standard size web to double the mesh size. The large was hung at a ratio of 2:1. One of the experimental nets used beackets pieces of rope extending from the cork line down to the top or the webbing instead of large mesh webbing. Each net was 100 fathoms long. The total the net was 60 meshes of 7 inch mesh. The bottom of the test portion was

Results. 81 sets were made. Total catch = 1,342 chum, 1 steelhead, 3 chinook and 23 sturgeon. The results of the 1998 Fraser River modified were inconclusive. The relatively low numbers of chum that were captured near total absence of any bycatch species made it impossible to assess the effectiveness of the nets. Fishing began on Nov. 6 but chum fishing in the River traditionally occurs in mid-October when the majority of chum as well

as many
study
catches
condition of
report.
bycatch,
only
a nets.
from 0 to 4)
sample
Conclusions
target species.

coho and steelhead are present in the River. The Late start-up date for the
resulted in very few bycatch species being captured as well as relatively low
of chum. Raw catch data are presented in the report along with data on
fish and release. The results of the statistical analysis are presented in the
Statistically significant differences were found in the proportions of total
coho and chinook to chum in the test versus control halves of the nets. The
steelhead encountered during the study was caught in the test half of one of
The very low numbers of bycatch species in each half of the net (ranging
are of concern when interpreting the results of the analysis. Such small
sizes can lead to large amounts of variation in the results and low-power for
statistical tests. The very large mesh size and becket design used in 1998
The study was inconclusive owing to low catches of target and non-

Recommendations
and in a place

Recommendations. 1. The modified gillnets require testing at a time
where there will not only be significant numbers of chum but also significant
numbers of bycatch species. If this is not possible in the lower Fraser River
system
then an equivalent location must be found. 2. As large as sample size as
possible
should be collected. There should not the constraints on the numbers of
either
target or bycatch species that can be captured. These types are restrictions
only

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Sector Gillnet
SubSector Weed line

Report # 43

ReportTitle Experimental beach seine fishery

ProjectTitle NA

Author NS
while maintaining catch in the lower portion was built and tested in an attempt
to
reduce bycatch during chum fishing in the Fraser River.

ReportDate nd

ProjectYear 1998

Proponents Fraser River Fishermen Society; Kwantlen First Nation; Katzie First
Nation

State BC
half the total height or 30 meshes of 7 inch mesh.

Objectives NS

Gear Selective fishing gear and method. The first three days the beach had to
be cleared
of all snags so that the net would not be damaged. The net was 900 feet
long. The
lead line was lightened from eight pounds per fathom to two pounds per
fathom.

Results Results. A total of 2,827 chum were caught at Derby Reach. 2,811 fish
were an
excellent condition and kept for food and ceremonial purposes. 1,504 chum
were
caught and released in excellent condition. 159 coho were captured. 5
chinook were
captured. 3 steelhead were radio tagged. DNA samples and other data were
obtained. Quick sets of approximately five minutes work best so as not to
crowd the
fish. The net was best set during slack tides. On hard running tides a shorter
net

Conclusions presented nearly all captures of fish in the top half of the test nets but
the
corresponding bycatch in the control half of the nets was very low resulting in

Recommendations Recommendations. 1. Tested this gear during the sockeye in pink season. 2. Attach surplus rings on the net so it can be completely closed up. 3. Fish when there is a surplus available so all moneys can be returned to the selective fishing program for the next

Outcome Objectives met

Sector Alternate

SubSector Beach seine

bias results by reducing available fishing time and reducing sample size and possibly altering fishing patterns.

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Report # 47
ReportTitle Secwepemc selective gear development program 1998
ProjectTitle NA
Author Murray D. Ross
ReportDate March 1999
ProjectYear 1998
Proponents Shuswap Nation Fisheries Commission
State BC

Objectives
difficulty harvesting
selective
protecting
into the
migration
coho, to

Objectives. Participating Shuswap Indian bands have experience their salmon allocations. Many gear types are being tested including non-gillnets by these bands. This project was designed by the Shuswap Nation Fisheries Commission to demonstrate that more selective fishing gear can be equally effective in capturing target stocks and much more effective in weak stocks. Specific objectives included: to re-institute selective harvest techniques in near-terminal fisheries; to conduct research and development effectiveness of selective live capture salmon fishing gear in the Fraser River watershed; to improve community involvement and understanding of selective fishing techniques in local First Nations salmon harvesting; to improve timing information for weaker salmon stocks, especially Thompson River

Gear
effectively
streams
larger
methodology
tagging,
were

Selective fishing gear and methods. Traditional traps and weirs are being used by Shuswap bands for stock assessment and harvesting in smaller but because of past river dredging and boat traffic they are impractical in larger streams. Beach seining has proven to be an efficient, selective capture for use in larger streams with very low mortality rates for released fish. No scale sampling or length measuring was undertaken to avoid unnecessary handling of fish in warm weather conditions. Samples for genetic analysis were

Results
the six study
not
and site
during
independents
presented in
Detailed

Results. Gear trials were successful at capturing chinook and only to of sites both located in the lower Shuswap River. Late summer sockeye were not effectively captured at any of the study sites. Fish capture data by species are presented in the report. No Thompson River coho salmon were captured during the course of the study. No fish captured required additional holding independents to resuscitate before release. Data on disposition of fish by species is presented in the report. Detailed results for each study site are presented in the report. fish capture data by date and site and species are provided in Appendix #1.

Detailed

Conclusions NS

Recommendations Recommendations. Other locations for Beach seining trials should be investigated.

needed At locations chosen for gear testing, more detailed site work on a sense is needed to better determine fish holding areas and identify locations of submerged snags.

begin Selective gear other than beach seine's should be tested at some locations including trap nets and large mesh tangle nets. Beach seining activities could

sockeye one month earlier than many locations targeting capture of early summer and better quality chinook and ensuring that accidental capture of Thompson

River coho is even less likely; greater attention will need to be given to warm water

stress of captured fish if this is done. The configuration of each beach seine nets

needs to be tailored to each site. Monofilament Web should be used in streams with

Outcome Objectives met

Sector Alternate

SubSector Beach seine

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Report # 47

Nations protect them from over-harvest; to improve public relations concerning First exercising aboriginal fishing rights.

taken from coho provided it could be done quickly and in water.

presented in data on condition of fish at release by date, location and species are Appendix #2.

water in Clearwater. The depth of each Net must correspond closely to the depth of fish holding areas. The weight of the lead line must be appropriate to the flow conditions.

Report # 50

ReportTitle Seine brailer and wet sorting study -- Final Report

ProjectTitle NA

Author Glenn Budden

ReportDate Nov. 15 1999

ProjectYear 1999

Proponents Glenn Budden

State BC

Objectives designs, the 1999, the successful merits

Objectives. In 1998, after running pre-trials on five different brailer proponent tested the two most promising designs along with the standardized brailer and ramping. The 1999 study is a continuation of the 1998 effort. In 1999, the objective was to carry out more comprehensive testing on the most successful designs -- the wet and sock brailers -- and expand the study to examine the merits

Gear project brailer.

Selective fishing gear and methods. Selective fishing gear tested in this project includes a wet brailer, a sock brailer, a wet sorting box and a "standardized" brailer. This gear is described in detail, with diagrams, in the report.

Results

Conclusions

Recommendations Recommendations. After two years of studies, it is fair to say that options to improve seine selectivity have been thoroughly explored. Although a mortality study would have provided more conclusive results, if stress test data support observational findings we can reasonably recommend the following. The sock brailer demonstrated the best performance. The benefits to coho survival were significant with relatively few concerns or drawbacks. The wet sorting box was also successful in making seine selective harvesting more fish-friendly. It is, however, an extreme measure that should be considered carefully. The benefit gained does not seem justified given concerns about the difficulty of identifying and removing non-target species, water and fish spill edge in adverse weather, high-cost and added time requirements. A fish-friendly sorting box is recommended but not necessarily filled with water. Used in combination with a sock brailer, a dry sorting box will retain enough water from the brailing process to benefit the fish without adding the concerns of a full wet box. The author recommends "a broader application of the sock brailer and a sorting box via a red zone test fishery so the larger but manageable group of seine scan experiment with this gear. While the high visibility of the brailer and box make them feasible to monitor and enforce, their success is largely dependent on how they are used. Fleet-wide compliance with standardized handling practices must be insured to succeed in reducing coho mortality. This could be accomplished by: educating seine license holders, skippers and crews on clearly-defined handling methods and why they are necessary; making the consequence of non-compliance severe and penalize the individual not the entire

Outcome	Objectives met
Sector	Seine
SubSector	Brailing

Report # 52

ReportTitle Modified tooth tangle net

ProjectTitle NA

Author Mark Petrunia

ReportDate Jan. 15 1999

ProjectYear 1998

Proponents Mark Petrunia

State BC

Objectives monofilament tooth net therefore tooth third release fish. Objectives. To test and compare a 3 1/2 inch drop single strand tangle net and a 3 1/2 inch multistrand #19 nylon tooth tangle net (the same used in the 1997 experiment). The objective was to reduce bycatch of coho in chinook salmon because the single strand monofilament net is stiffer and would not be as likely to wrap around the fishes' perculum and chief as easily thereby allowing the fish to escape the net. The second objective of the 1998 experiment was to test the catch efficiency for chum salmon of the two drop tangle nets against her regular 7 inch multistrand nylon chum drop net. The objective was to obtain data on the tooth tangle net and its ability to live-release fish.

Gear net. The gear Selective fishing gear and methods. 3 1/2 inch multistrand tooth tangle was fished through all stages of tides during daylight hours. A multi-panel

three
nylon net.
panel
was 25
meshes,
the drop
and a
tank

panel net was tested. The first panel was a 7 inch regular #23 multistrand
The second panel was a 3 1/2 inch multistrand #19 nylon tooth net. The third
was a 3 1/2 inch single strand #6 monofilament tooth tangle net. Each panel
fathoms in length. Above each of these three panel's was a drop net of 14
each mesh of 17 inches, resulting in a total drop of 238 inches. The drop was
implemented because of the success of drop tooth net in 1997. In that year
tooth net had a 0 bycatch of steelhead and 58% decrease in coho bycatch
61% decrease in chinook bycatch. All fish caught were held into live tanks
measuring 52 inches long and 29 inches wide and 15 inches deep. Each live

Results
chum, 14 coho
wrap
chum
increases
net is
strand
an
coho
more
=
3 1/2
inch
chum

Results. The entire net produced a total salmon catch a 3 header 14
and 1 spawned out chinook. The single strand monofilament net does not
around the fishes' operculum and teeth as easily as the multistrand nylon net.
Chum salmon came out of the single strand monofilament net easier than the
multistrand nylon net. "Over-the-roller" drop-off is higher with the single strand
monofilament net. The 3 1/2 inch single strand monofilament net caught less
than the 3 1/2 inch multistrand nylon net. The monofilament net, however
coho catch. This may be due to the fact that the single strand monofilament
more transparent in the water than the multistrand nylon net. What the single
monofilament net lacks inefficiency in catching coho by their teeth is made up
increased by its transparency and therefore the increase in the number of
contacts with the net. The single strand monofilament net seems to remove
scales on some coho. The mail: female ratio of chum caught in the 7 inch net
3.22:1; the same ratio for the 3 1/2 inch multistrand nylon net = 4.75:1; in the
inch single strand monofilament net male:female ratio = 4.38:1. The regular 7
net therefore appears to catch a lower ratio of male:female chum salmon. All
caught in the 7 inch net were able to be released alive some fish needed

short-term
Conclusions
coho
selective
fish
inch
the chum,
is
mortality of

Conclusions. The single strand monofilament net is a failure in reducing bycatch. It's greater scale loss makes it less attractive and less feasible as fishing gear for coho. The single strand monofilament net is more difficult to and not as easily repaired. As anticipated, this experiment showed that a 7 multistrand nylon net is more efficient than the 3 1/2 inch nets. Almost half were taken in the 7 inch multistrand nylon net. Due to a small catch of coho, difficult to say with any accuracy what the relative bycatch and short-term the various panels on coho salmon might be. 0 catch of steelhead can be

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o

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The
during
Outcome
Sector

n
drop mesh. Use of the drop net is worthwhile given 0 bycatch of steelhead compared to a relatively small decrease in catch efficiency of chum salmon.

multistrand Island net in the 7 inch multistrand net should be further tested October when fish are present. Short-term and long-term studies should be

Needs further study
Gillnet

Report #

52

conducted on survival rates of fish released from these nets.

SubSector

Monofilament; multistrand; weedline

tagged and was supplied with 25 gallons per minute. All chum salmon caught were released alive.

time. Total reviving and someday have slight gill bleeding which stopped after short steelhead caught in all tests = 0.

used of accomplished with only a 17.6% decrease in chum catch efficiency which the drop net.

Report # 53

ReportTitle Observer report for T'sou-ke fish trap--phase 1

ProjectTitle T'Sou-ke First Nation trapnet, phase 1

Author Pamela Thuringer

ReportDate nd

ProjectYear 1998

Proponents T'Sou-ke First Nation

State BC

Objectives To further test the T'Sou-ke fish trap

Gear Selective fishing gear and methods. The 1998 project involved continued testing of a trapnet design resulting from three years of research and development based on traditional concepts and local wisdom along with expertise from Newfoundland cod trap fishermen. Having proven the potential of the trap design for catching Pacific salmon, the present focus has turned to scaling it down to make it more user-friendly and less labor-intensive. A movable selective harvest platform has also been fabricated to streamline the retrieval of fish from the trap. In 1997 the trap was about 35 fathoms by 12 fathoms with a 120 fathoms lead, manned by crew of 6. In 1998, the trap was modified to be managed by a crew of 4. This was achieved by cutting two chambers out of the trap and by reducing the length of the leads. In this

along
securely
to
found to be
important
which

modified designed, the outer lead was 9 fathoms while the inner lead running the edge of the kelp was 5 fathoms in depth. In the past, anchoring the trap to the bottom relied heavily on diving. A system of "down hauls" was devised to secure the lower structure of the trap to the anchoring system. This was ineffective however and eventually the trap was secured by diving. Another modification in 1998 was a movable selective harvest platform and net pen

Results was not
three fish
tireless
project
been
Stellar sea
stability in the

Results. The dynamics of the trap appeared to be working but the trap fished during the early Stewart River sockeye run and consequently only were caught in the entire season -- 1 sockeye, 1 chinook and 1 coho. The foraging of California sea lions that arrive in mid-August has plagued the project since its inception. They quickly become habituated to the trap and there has been no success to date in discouraging them from interfering with the catch. lions, in contrast, tend to keep their distance and resident harbor seals can be frightened off through hunting. Anchoring a trap of this scale to ensure

Conclusions None offered in paper.

Recommendations None offered in paper.

Outcome Needs further study

Sector Alternate

SubSector Fish trap

Report # 54

ReportTitle Observer report for Daikow trap net

ProjectTitle NA

Author Bruce Biffard

ReportDate nd

ProjectYear 1998

Proponents Gerry Diakow and Wilfred Wilson

State BC

Objectives
operating a
1998
toward a
across a

Objectives. Pilot project designed to test the feasibility of setting and stationary salmon trap in the mouth of the Fraser River. The project goal for was to construct and assemble a prototype gear capable of leading fish one-way exit where their movement through the trap could be observed

Gear

Westcoast trap net (see report for details of design)

Results
startling.
the
on
would be
which

Results. The effect of tidal action on stationary gear is best described as The deceptively gentle tied that carries gillnet vessels and their gear serene downstream reveals its true power when opposed by stationary gear. Based on experience gain during the course of this pilot project a different procedure followed for setting the trapnet. Testing was conducted during December

Conclusions

Conclusions. This type of anchored trapnet can be fabricated and

assembled with ease and at reasonable cost from materials and components readily available to commercial fishermen. The trap is large enough to harvest salmon in insufficient numbers to make a profit its small enough to be set and retrieved by conventional

Recommendations Recommendations. Facilitate testing by setting the trap in clear, shallow water. Test the trapnet's ability to capture target species when salmon are migrating in significant numbers. Test the trap in other locations. Encourage others to design and innovate. Employ the trap to monitor and a value age salmon runs and collect data; this kind of trap could be used to obtain scale samples and tag fish.

Outcome Objectives met

Sector Alternate

SubSector Fish trap

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Report # 55

ReportTitle	Observer report for Massey fish trap
ProjectTitle	NA
Author	Jay Sitar
ReportDate	nd
ProjectYear	1998
Proponents	Richard Massey
State	BC
Objectives to as the the out that If of target	Objectives. To test a modified design of the Alaska floating trap (referred to as the Steveston or Albion trap). To see if the trap could be set and maintained in current and in adverse weather conditions. The proponent's wanted to find out that salmon would follow the league wings and pass-through sections of the trap. If successful, this type of trap designed could prove a strategy for live capture of target
Gear contours of the product the design Prince	Selective fishing gear and methods. The trap was designed to fit the river bottom. The proponent's proposal included a study of the market for product caught by this gear. Project approval was for the first stage including testing the design and catchability of the gear. Trap design is based on an Alaskan trap of modified to resemble the Finnish design used successfully by a group of Prince
Results and retrieve very excellent for approaching	Results. Only two fish were caught. The net was extremely easy to set provided the tide was used to full advantage. The app River anchor must be large to hold the trap in place on the full ebb tide. This trap design is debris deflection. Seals were extremely curious and showed no fear
Conclusions	Conclusions. The project probably started to late to effectively test

whether salmon
gillnet set would follow the league net into the trap. It would've been helpful to test a
to see if any time salmon were present when the trap was operating.

Recommendations Recommendations. It would be interesting to test solid leads or
wings rather than
netting which billows out in a running tide. Salmon are known to follow a
Rockwall or line of filings out of the flow into the slower current. Historically, First Nations
used

Outcome Results inconclusive

Sector Alternate

SubSector Fish trap

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Report # 56

ReportTitle Observer report for T'sou-ke fish trap--phase 2

ProjectTitle T'Sou-ke First Nation trapnet, Phase 2

Author Bruce Biffard

\\svbcvanfp01\Cohen-Comm\Personal_Drives\Resource
Management\Gordon Curry\Cohen - Gord Curry\2005\Fi
sheries Management>Selective Fishing\

ReportDate	nd
ProjectYear	1998
Proponents Fishermen Society	T'Sou-ke First Nation; Tsawwassen First Nation; Fraser River
State	BC
Objectives	to test the T'Sou-ke First Nation fish trap in the Fraser River.
Gear wide and 4 net deep, ebb flow	Selective fishing gear and methods. The single heart trap was 6 fathoms fathoms deep with a 4 fathoms deep spiller and a 2 fathoms deep removable pen. All mesh was 2 inch knotless web. A 10 fathoms outer lead, 4 fathoms and a 7 fathoms inner lead, 2 fathoms deep, were installed. The trapnet was oriented and anchored so it opened up facing downstream according to the
Results number of in an such a before in	Results. Total salmon catch = 82 chum, 1 chinook, 3 steelhead, 0 coho. A other species were also caught. All fish were released in the same condition which they were captured. Interference by seals and sea lions continue to be an issue. Interference with migration may be a concern to be addressed with large trap. For the same reason that fish tend to hold downstream of fences eventually migrating through, it might be worthwhile looking at similar effects
Conclusions successful in capable of down.	Conclusions. The first trials of the trapnet in the Fraser River were demonstrating that the trap could be set and maintained and that it was bringing fish in. Testing took place late in the season when chum levels were
Recommendations	None.
Outcome	Needs further study
Sector	Alternate

SubSector Fish trap

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Report # 57
ReportTitle Observer report for Mowat trap net
ProjectTitle NA
Author Chris Sledz
ReportDate nd
ProjectYear 1998
Proponents Brent Mowat; Michael Mombourquette; Wilfred Wilson; James Dobrilla;
Ronald Birch
State BC

Objectives fishing	To design and build a fish trap using currently available commercial fishing
Gear leader lines, 1 by 40 meshes	Selective fishing gear and methods. A three-part trap: trap pond, two setting net. The trap area where the fish entered the pond measured 60 feet by 40 feet. The two leader lines were made from 3 in. knotted seine webbing 150 meshes
Results report. There difference.	Results. A number of problems with the gear and respective solutions are described in the report. Catch data by day and species are presented in the report. There were no major problems with the design which worked as expected. There were no problems when setting or retrieving gear. The weather made no difference.
Conclusions to perfect the selectively	Conclusions. A trap of this nature can be used successfully given time techniques used here. 0 mortality of all catch indicated it is possible to harvest target species while releasing non-target species in perfect condition.
Recommendations with different in the	Recommendations. More time and testing is needed to experiment equipment targeted at catching different species and that different locations in the
Outcome	Objectives met
Sector	Alternate
SubSector	Fish trap

Report # 59

ReportTitle Area D Salmon Gillnet Association selective fisheries project--Part 1

ProjectTitle NA

Author Archipelago Marine Research

ReportDate nd

ProjectYear 1999

Proponents Area D Salmon Gillnet Association

State BC

Objectives Objectives. To identify areas of coho abundance. To conduct time-of-day
net experiments to identify how catch rates vary over the day. To test alternate
species. configurations with regard to the encounter rate and mortality of non-target
revival tanks To examine fish handling procedures, in particular the use of on-board

Gear Selective fishing gear and methods. 9 gillnet vessels, fishing in groups of 3,
so that participated in the study. Each vessel within a group set gear into direct line
hour. three test nets fished as one net. So time for each set was limited to one
Vessels were to commence sets and pick nets simultaneously. Sets were

made at morning, a dark and randomly during the day. Each vessel within a group was equipped with an Alaska Twist net. Nets were identical in terms of mesh size, number of meshes and length. The hang ratio of each net vary from 2.15:1 (control); 2.00: 1 and 2.30: 1. Vessels within each group rotated nets. Observers collected data on fish handling procedures by assessing condition of all coho encountered at

Results Results. 424 sets were made over a five-day test period. Detailed data are presented in the report. 10,838 salmon were encountered, 91.4% of which were sockeye, 3.8% pink, 2.9% coho, 1.9% chum, chinook, steelhead, Atlantic salmon combined. CPUE was calculated and is presented in the report. Data are also presented on catch of non-salmonid species, marine mammals and seabirds. Detailed data are presented on location of catch of sockeye and coho. Coho catch rates were highest during the morning sets and the first dark set. Results indicate that the highest incidence of coho occurred during dark sets. The encounter rate for coho is statistically significantly higher during morning and dark sets enduring day

Conclusions Conclusions. Area specific catch data provide an effective method to reduce the encounter rate of coho while continuing to provide an opportunity to catch sockeye. Test results indicate that coho catch can be reduced by time of day restrictions but that this may also have an impact on sockeye catch. Closing an entire area may not be necessary if limited time of day closures can achieve lower encounter rates of threatened stocks or species. Testing indicates no statistical difference among

Recommendations Recommendations. Assign a coho allocation along with the area licensing sockeye allocation. Conduct further testing using nets with various hang ratios to determine if the use of these nets can result in lower coho encounter rates. Continue with pre-fishery abundance testing to continue mapping coho migration patterns and run timing. Review fish handling procedures and the use of on-board revival

tanks.
commercial
methods to

Conduct stock assessment fisheries in areas that have been closed to
gillnets for several years. Continue to develop real-time catch reporting

Outcome Objectives met
Sector Gillnet
SubSector Alaska twist

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Report # 59

to determine whether lower mortality rates can be achieved.

time of capture and at time of release. All vessels were required to use
revival tanks.

catch sets. With regard to hang ratio, the control net (2.15: 1) have the lowest coho rates but the differences are not statistically significant.

hang ratios.

improve timely data transfer.

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Report # 60
ReportTitle Redesign and testing of commercial salmon fishing revival tank and

\\svbcvanfp01\Cohen-Comm\Personal_Drives\Resource
Management\Gordon Curry\Cohen - Gord Curry\2005\Fi
sheries Management>Selective Fishing\

related

ProjectTitle	NA
Author	Jake Fraser
ReportDate	December 1999
ProjectYear	1999
Proponents	Jake Fraser; Simon Fraser University
State	BC
Objectives and coho by-	Objectives. To determine the effectiveness of a redesigned recovery box modified harvesting techniques for increasing recovery and survival rates of coho by-
Gear modified by individual included. were recovery data stress and work swim process targeted using	Selective fishing gear and methods. The standard revival tank was incorporating a central longitudinal divider to create two water channels, water Inlet's and outlets. Swim-through exit doors and chutes were also Water flow rate = 0.6 liters per second per fish. Blood and tissue samples taken for assessment of physiological condition before and after periods of to determine the effectiveness of the tank design. Baseline swimming ability was obtained by use of a floating, portable, self-contained swim tunnel. These baseline data were used for comparison with physiological indicators of visual condition categories observed at capture and release. Much of the conducted in Alert Bay involved refinements to the recovery box is and the tunnel to make the more effective in promoting and evaluating the recovery after release. In September 1999, the modified recovery box was tested a coho fishery in Alberni Inlet. Fish were caught using commercial gillnet gear 200 fathoms 4 7/8 in. 90 mesh Alaska Twist, paneled, hung at 2.0: 1, and 60
Results	Results. Fisheries and Oceans Canada standard five category rankings

been was amended by expanding category 3 to 2 levels of lethargy and category 5 to include "actual dead" and "revived dead". 130 coho were caught in this study. There was a substantial decrease in category 5 fish for 20.2% to 1.8% when category 5 fish are

Conclusions dramatically Conclusions. The newly designed recovery box system is capable of reducing coho mortality.

Recommendations expects a mortality rate of 60-70% on coho with conventional gillnet gear and techniques. The Alberni Inlet experiments conducted in 1998 resulted in a 45-60% mortality rate. The experiments discussed in this report showed a 2.2% average mortality rate for coho with the new recovery box. The new recovery box and net design, along with live catch techniques and handling suggestions, should be tested during commercial gillnet test fisheries at the earliest opportunity. The current visual ranking system requires re-evaluation. Reduction in mortality and impact on by-catch require either avoidance or low stress handling techniques on catch and release. Small changes in that configuration and implementation can bring substantial gains in survive ability with very low cost. Using nets that function as a gillnet for target species and tangle net for larger, non-target species is an area worth exploring. Short sets are very effective for live catch. Net web construction can strongly influence live catch or avoidance. The two types of net used in these experiments should be further tested

Outcome	Objectives met
Sector	Gillnet
SubSector	Revival tank

Report #	61
ReportTitle revival	Phase 2 -- project summary of mortality comparisons between standard
ProjectTitle	NA
Author	Wilf Caron
ReportDate	Dec. 1999
ProjectYear	1999
Proponents Association. NCN/WCVI	Area G Troll Fishery Association. West Coast Sustainability
State	BC
Objectives traditional de- aboard with	Objectives. To measure mortality of captured coho salmon using hooking at the side of the vessel versus bringing the unwanted by catch the additional necessary handling procedures.
Gear study, two resuscitation box Kempton morts, the being Vigorous fish	Selective fishing gear and methods. Four troll vessels participated in the using the live-release technique (Test A) and two using a standard (Test B). The two Test A vessels placed all hooked coho directly into a cage attached alongside. Other salmon species were noted and released immediately at the side of the vessel. After 2-4 hours and removal of any cage was returned to net pen where coho were observed for 24 hours before released. The two Test B vessels placed all hooked coho into the blue box. fish were removed and deposited in cages as soon as possible while lethargic
Results	Detailed data tables are presented in the report.

Conclusions were wounds number of fish complete
Conclusions. Because of the low number of hooked fish no conclusions were derived based on analysis of data. By utilizing a common #5 hook and a true barbless hook, captured coho had minimal damage with the majority of confined to the jaw. There was, however, a noticeable increase in the number of fish there were able to get off hook on their own accord. SFU staff were able to complete

Recommendations in the longer time net pen more sea
Recommendations. Continue the studies -- site location needs to be refined to take advantage of local abundances. Comparisons of species need to be included in the database. Multiple net pen arrangements are required when 24 hour or longer time periods are used. Use pens as designed by Jake Fraser. Predator nets at net pen site are required. Modifications to Kempton cage are required to make it more sea

Outcome Results inconclusive

Sector Hook & Line

SubSector Commercial troll

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Report # 62

ReportTitle	1999 Nitinat (Area 21) gillnet test fishery by-catch study
ProjectTitle	NA
Author	NS
ReportDate	January 2000?
ProjectYear	1999
Proponents	Area E gillnet fishermen's association
State	BC
Objectives minimizing species. chinook bycatch abundance.	Objectives. To assess harvesting and identify optimal methods of bycatch of steelhead, coho, marine mammals, birds and other non-target species. To identify the temporal, vertical and spatial distribution of steelhead, chum, and coho in the Nitinat commercial fishing area from late September to early October 1999. To experiment with urinary age ands as a means a reducing and optimizing chum catch. To determine migration routes, timing and To continue experimentation with sonic devices in a reducing marine mammal
Gear Area E standard 6 in., 6 twist net. test soak daylight Fishing gear	Selective fishing gear and methods. 7 gillnet fishing vessels licensed for were contracted. Each fished to chum gillnets with pingers. Nets were length (200 fathoms), 90 mesh is the, various colors and mesh sizes (5 7/8, 1/8, 6 1/4, 6 3/4). Each vessel used one standard nylon net and 1 Alaska All test boats were required to fish nets Hong onto meter weedline's during fishing. Alaska twist was not legal in the commercial fishery. The prescribed time was an optimum of 60 minutes. Test fishing was carried out during hours only to protect coho stocks that might be migrating through the area. effort was split evenly between regular mesh and Alaska twist nets. Detailed

Results test fishery
70 coho,
catch
twist
needed to
with Alaska

Results. 12,272 chum were caught in the observed portion of the gillnet and the first five-day commercial opening. Incidental catch = 11 steelhead, 3 chinook, 21 pink, 0 sockeye and 39 birds during the study period. Five-year results are presented in a report (p. 13). Catch data by gear types (Alaska versus standard nylon) are presented in the report (p. 17). More testing is needed to verify the relative effectiveness at catching target and non-target species

Conclusions
enhanced
species.
minutes
Initial

Conclusions. CPUE statistics from five years of this project indicate the modification of the management area, gear and fishing techniques have enhanced chum catch while decreasing catch rates of steelhead, coho and other species. Pingers weren't essential deterrent effect on marine mammals. The 60 minutes limitation on soak times during the commercial fishery needs to be reviewed. Initial indications are that drop weedline's appear to reduce bird bycatch.

Recommendations
Kill all
Change 1-
observer

Recommendations. Do some limited test fishing east of Dare Point during the early commercial fishery for comparative data even if the area is close to the fleet. Kill all adipose fin clipped coho for DNA sampling. Scrap 60 minutes set times. Change 1- 800 hail reporting to 48 hours. Provide nose fork measuring boxes. Provide observation sheets for seen mammals. Have delivery summary form to observer

Outcome Needs further study
Sector Gillnet
SubSector Alaska twist; weedline; day-night fishing

Report #	63
ReportTitle	1996 Area 4 special seine fishery -- summary report
ProjectTitle	NA
Author	J. O. Thomas
ReportDate	NS
ProjectYear	1996
Proponents	NS
State	BC
Objectives retention of	Objectives. To conduct a special selective fishery allowing only the sockeye and pink salmon.
Gear sets. Blue in to a grounds.	Selective fishing gear and methods. Seine licensed vessels only. Brail all box on-board. Observer on-board. Enter fishery with no fish on-board. Hail fishery patrol vessel. Hail catch to a fishery patrol vessel prior to leaving the grounds. Off load all fish before proceeding to another management area.
Results 455 seine coho. 9078 species Average catch	Results. Hailed catch data by species and date presented in the report. vessel fishing days. Total catch = 202,843 sockeye. 534,428 pink. 2498 chum. 273 chinook. 2521 steelhead. Data on condition of released fish by and method of handling and condition of fish presented in the report.
Conclusions	None stated in report.
Recommendations	None stated in report.
Outcome	Objectives met

Sector Seine
SubSector Catch and release monitoring

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Report # 65
ReportTitle Assessment of a salmon trap for selective harvest
ProjectTitle NA
Author Heydon Creek salmon enumeration project
ReportDate nd
ProjectYear 1999
Proponents Campbell River Indian band

\\svbcvanfp01\Cohen-Comm\Personal_Drives\Resource
Management\Gordon Curry\Cohen - Gord Curry\2005\Fi
sheries Management>Selective Fishing\

State	BC
Objectives salmon trap and To carcass	Objectives. To evaluate the design and effectiveness of a floating fish handling methods for the capture and safe release of non-target species. To determine the level of post-release mortality from time of release at the trap to recovery at the enumeration fence then subsequent survival to spawning, by and tag recovery throughout the watershed. To assess the effectiveness of a
Gear experience included	Selective fishing gear and methods. Trap design was based on reported in three other locations, primarily the Sooke trap. Diagrams of the trap are
Results chum salmon within six the	Results. Detailed catch data are presented in the report. Only seven were captured. To escape over a sunken cork line; 5 were tag and released immediately. One of the tag fish was recovered in good shape at the fence hours; none of the other four tag fish were recovered at the fence or during the
Conclusions run size for 48%. A Heydon intercept a portability would've been	Conclusions. Project results were far short of expectations but the total chum salmon was down 90% from the previous year and for coho salmon by total count of only 2006 under 99 chum and 459 coho pass through the fence between September 1 and November 24. A longer lead net would wider cross-section of the Bay. The most serious problem was the lack of because of the excessively heavyweight of the heart and lead net. It
Recommendations The lead net flotation stanchions.	Recommendations. The trap must be made much more portable. needs to be twice as long. The heart and inner wing should be hung square. Alternative sites including one in deeper water should be identified. The system along both sides of the spiller should be upgraded with verticals Reduce costs by operating only during peak fishing. (Oct. 1-Nov. 10). Make allowance for additional part-time help as required. Increased tag recovery

effort in

Outcome Needs further study

Sector Alternate

SubSector Fish trap

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Report # 66

ReportTitle Area D Salmon Gillnet Association selective fisheries project--Part 2

ProjectTitle NA

Author Les Rombough

ReportDate January 2000

ProjectYear 1999

Proponents Area D Salmon Gillnet Association

State BC

Objectives Objectives. To identify areas of coho abundance. To conduct time of day experiments to determine whether non-target species catch rates are lower at specific times of day. To test various gear configurations to determine

whether different net types (60 mesh multistrand and 90 mesh Alaska twist) affect the encounter rate and mortality of non-target species. To examine fish handling procedures especially the use of on-board revival tanks to determine whether lower mortality rates could be achieved. To pilot 2 distinct satellite communications

Gear designated Selective fishing gear and methods. To groups of 6 vessels fish the areas for three weeks. The first group fished the first three weeks; the second group fished the second three weeks. Pairs of vessels required to set gear in a direct line with the objective of having to test nets fishing as one. Soak time for each set was limited to one-hour. Vessel operators were to commence sets and pick nets simultaneously. They were to court made the location of sets and use discretion when setting nets taking into consideration weather and tidal conditions. To determine areas of coho abundance three test fishing regions were fished during each two-day test period. The time of day catch comparison was a major component of the study. Much of the focus was on comparing catch results between morning sets, dark sets, day sets and random night sets. Each vessel supplied its own weedline. The standards 60 mesh multistrand net (the control net) hung on a 6 inch Area D Salmon Gillnet Association supplied each test their with one 90 mesh Alaska twist net. Test vessels alternated use of the Alaska twist net. Catches with each net types were compared to determine if using a different gear configuration could reduce bycatch. Observers assessed the condition of all coho encountered at time of capture and at time of release. Use of revival tanks was required. Observers

Results by Results. 694 sets were made over a six-week period. Detailed catch data by species are presented in the report. 11,700 need Salmon were encountered: 96.9% chum; 1.5% coho; 1.4% pink. The remaining 0.3% consisted of chinook, steelhead and Atlantic salmon. Catch rates by species and location are discussed in the report (pp. 13-14). Coho catch rates were highest during morning sets and lowest during day sets. Chum catch rates mimicked the same pattern. The gear

comparison study showed that the Alaska twist gear, more chum and more coho than the control net. Detailed results are presented in the report. The report also contains data on the

Conclusions be achieved Conclusions. The most significant gains in reducing coho bycatch can be achieved by selective area management taking into account run timing when scheduling commercial fisheries. By examining area-specific catch data, an avoidance-oriented fishing plan can be developed that is effective in reducing the encounter rate of coho while still providing an opportunity to achieve chum allocations. During the test period, there were significant declines in coho encounter rates as the season progressed and coho stocks naturally declined due to run timing. Interestingly, chum productivity increased as coho encounter rates decreased during the second half of the study. The lowest encounter rates for coho were consistently realized during the day. However, chum encounter rates are also lowest during the day.

Recommendations in all Area D Recommendations. Standardize the use of Alaska twist gillnet web chum gillnet fisheries. Expand maximum net depth allowed in Johnstone Strait and Qualicum chum fisheries from the present 60 meshes to 90 meshes. Assign a Wednesday, October 08, 2003 Page 79 of 180

Report # 66

Outcome	Objectives met
Sector	Gillnet
SubSector	grounds in real time.
fish handling;	Time of day; location mapping; Alaska twist; weedlines; revival boxes;
ReportTitle	Hooking mortality review
ProjectTitle	Troll studies for chinook and coho use of revival tanks was a factor in any change observed.
Author	Doug McNair, Natural Resources Consultants Inc
ReportDate	October 8 1999
ProjectYear	2
Proponents	Pacific Fisheries Management Council
State	Various
Objectives commercial troll	Review article assessing literature on hook and line mortalities in
Gear	Various commercial troll gear
Results	see report
Conclusions	see report
Recommendations	see report
Outcome	Objectives met
Sector	Hook & Line
and	amounts: 90 mesh Alaska twist net approximately double the catch of chum
SubSector	Commercial troll

with coho allocation along with the Area chum allocation. Conduct further testing
fisheries. Alaska twist web and 90 mesh nets in West Coast Vancouver Island chum

Continue pre-fishery abundance testing to continue determination of coho
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ul
handling the composite map can be developed over time. Implement revised fish
Fraser and procedures and revival tanks best occasions based on the study by Jake
close to SFU. Conduct stock assessment or pocket fisheries in areas that a been
the commercial gillnets for several years to obtain current data. Continue to test
studies and reliability and application of real-time catch reporting equipment infield
of assessment fisheries. Continue to use selective fishing as the measurement
harvesting fleet accountability (ie, industry participants must be able to quantitatively
needs to be clearly defined. demonstrate how they are able to fish selectively). The goal of selective

Report #	67.2
ReportTitle	Hooking mortality review
ProjectTitle	Sport studies
Author	Doug McNair, Natural Resources Consultants Inc
ReportDate	October 8 1999
ProjectYear	2
Proponents	Pacific Fisheries Management Council

State	Various
Objectives recreational	Review article assessing literature on hook and line mortalities in
Gear	Various recreational hook and line gear
Results	see report
Conclusions	see report
Recommendations	see report
Outcome	Objectives met
Sector	Hook & Line
SubSector	Recreational

Report # 68.1

ReportTitle NEAP research -- Final Report

ProjectTitle Commercial troll hooking mortality study

Author Doug McNair, Natural Resources Consultants Inc

ReportDate nd

ProjectYear 1997

Proponents Pacific Fisheries Management Council

State OR

Objectives captured on Objectives to measure the rate of mortality for chinook and coho salmon commercial trolled gear and released. To gather data to help identify causal variables associated with mortality and to compare these findings with those of

Gear four lines, Selective fishing gear and methods. Commercial troll vessels fished with each with 4-10 lures. One-half of the terminal gear consisted of flasher and hootchie; the other half consisted of various types of spoons. All lures were fished with #5/0 barbless Siwash single hooks. Fishing was conducted from a 13-June 12 of Brookings, from June 21-July 10 out of Newport, and from July 14-Aug. 1 out of Coos Bay. When a salmon was captured, it was either on hooked at the water line

Results coho. Ten Results. Total catch in all periods = 1123 salmon: 916 chinook and 207 coho and 75 chinook were excluded from the sample for various reasons. Estimated mortality rates = 20.9% for chinook and 39.6% for coho. The

observe mortality for coho is significantly different than chinook. Point estimates and
95% confidence intervals are presented in the report. Short-term mortality
(mortality at the time specimens were transferred from on-board holding to long-term holding)
= 7.1% for chinook and 9.1% for coho. Delayed mortality (mortality are
occurring within four days of transfer to long-term holding) = 13.8% for chinook and 30.5% for
coho. Data on incremental mortality at each observation time are presented in the
report. The pattern of incremental mortality of chinook observed through Day 3
resembles the observed by Wertheimer (1988 & 1989), and NRC (1994) and other
studies. Incremental mortality of coho salmon during the first two study periods was
nearly identical to the pattern for chinook. Data on mortality by location of hook
wound are presented in the report. Coho were almost twice as likely a chinook to be
hooked in areas associated with higher mortality. The report also includes analysis of
mortality by fish length, captured date and location, terminal gear type, water
temperature, use of anesthetic, experimental handling time, on-board holding time. A
multivariate

Conclusions author concludes Conclusions. For a variety of reasons discussed in the report the
lengths) the mortality coefficient for chinook salmon and arrange a 13.8%-21.2% (all
Pacific with a point estimates of 17.2%. The Chinook Technical Committee of the
account for Salmon Commission (1997) suggested an expansion factor of 1.13 to
study delayed mortality. Applying this expansion factor to the results of the current
salmon. yields arrange a 15.6%-24.0% with a point estimate of 19.4% for chinook
a point For coho salmon, the study suggests a mortality range of 25.8%-51.5% with
42.8% estimate of 37.9%. Adjusting for delayed mortality yields a point estimate of

Recommendations None provided.

Outcome Objectives met
Sector Hook & Line
SubSector Commercial troll

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Report # 68.2
ReportTitle NEAP research -- Final Report
ProjectTitle Effect of gear and methods on marine sports salmon hooking mortality rates
Author Doug McNair, Natural Resources Consultants Inc
ReportDate nd
ProjectYear 1997
Proponents Pacific Fisheries Management Council
State OR
Objectives to test the effect of gear and method on hooking mortality rates of salmon caught in marine sports fisheries.
Gear without Sportfishing gear and method. Single and tandem hooks trolling with and flashers; single and tandem hook conventional mooching; and single hook California mooching. Circle hooks and #6/0 commercial-hooks were added to the original seven treatments for 1997. Methods tested include: trolling herring baits, trolling with flasher and lure or flasher and bait, mooching with herring baits. To make herring baits rotate when trolled or drifted the bait was plug-cut. Barrs were

Results
1123 coho.
Two
showed
occurring
90% of
cases,
for fish
more
most
chinook
rates for
mortality
treatment, and
presented on
mortality

Results. During 1996 and 1997 data were collected on 544 chinook and 428 chinook and 706 coho were held on board for an average of 4 1/2 hours. veterans 6 chinook and 322 coho were held for up to four days. NRC 1994 that, for coho salmon taken on common sportfishing gear, all mortality within 24 hours of capture occurs within the first 2 1/2 hours; for chinook, mortality occurring within 24 hours occurs within the first 2 1/2 hours. In most death occurred in less than one hour. In the current study, the mortality rate held less than 2 1/2 hours was higher than the mortality rate for fish held for than 2 1/2 hours (16% vs. 10%) leading researchers to hypothesized that short-term mortality occurs before 2 1/2 hours. Short-term mortality = 6.1% and 14.3% coho. Coho mortality was higher than chinook mortality was all treatments except one. Statistically significant differences between mortality the two species were observed for three treatments. Detailed estimates of rates by treatment, mooching vs. trolling, mooching treatment, trolling single vs. tandem hooks are presented in the report. Results are also short-term mortality in relation to wound location and fish length. Delayed

Conclusions
salmon varies
wounds.
relationship in
hooks
appears to
the case

Conclusions. Data support the hypothesis that hooking mortality of according to the tendency of different gears and methods to inflict critical The apparent lack of a consistent relationship between delayed mortality rate, treatment type and critical wounds in coho, and the somewhat weak chinook, suggests delayed mortality data from this study are not useful for distinguishing differences among methods were treatments. Use of tandem reduced short-term mortality especially with mooching. Use of flashers have little effect on mortality. Mooching had higher mortality than trolling. In of chinook the difference was highly statistically significant. Higher short-term mortality with mooching correlated with greater frequency of gullet hook

wounds.
later,
mortality of
46% of
that
ultimately
managed
Oregon
that
this

Since a relatively high percent of fish surviving gullet hook wounds may die short-term mortality of mooching in this study may understate ultimate mooching, especially California mooching which inflicted gullet wounds in fish caught. Assuming most of these fish die supports Grover's conclusion hooking mortality in California sports salmon fisheries may exceed 50%. A shortcoming of this study was the small sample of coho caught with the T43 treatment, the treatment used predominantly in the Washington study that became the basis for the estimate of coho hooking mortality in PFMC-fisheries. The fact that the short-term mortality rate observed for T43 in the study was nearly identical to that observed in the Washington study suggests that the currently applied hooking mortality rate is appropriate for fisheries where gear-method predominates. A larger sample in the Oregon study would have

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Recommendations Implications for management of ocean sport fisheries. The following observations

study.
from 4.2%-
coho in
this study exceeded the upper limit of that range. In the Oregon study, the average

assume that delayed mortality was inflated by experimental methods in this study.
NRC 1944 estimated mortality over four days for coho of 6.2% in a range 8.5%. Short-term mortality rates for all but two of the treatments tested for coho in this study exceeded the upper limit of that range. In the Oregon study, the average

Report # 68.2

the NRC

short-term mortality rate for all treatments was 13.7% for coho. For chinook, 1994 estimated mortality rate = 10.2% in a range from 7.2%-14.2%. Two of

the
exceeding the
limit of
= 5.5%
treatment
applied
prudent
common.
fishery
the
would
in
gear

treatments tested in the Oregon study had short-term mortality rates
upper limit of that range and five had mortality rates falling below the lower
that range. The average mortality rate for all treatments in the Oregon study
for chinook. For fisheries where the predominant gear-method resembles
T43 (tandem hook trolling with herring bait with no flasher) the currently
mortality rate is appropriate. When estimating impacts, however, it may be
to adjust mortality rates in fisheries where other gear-methods are more
The mortality rate for coho caught incidentally in the Oregon targeted chinook
could be 2-4 times higher than that measured in the Washington study. While
research indicates that bycatch mortality in sports salmon fisheries can be
manipulated through regulation of terminal gear it also demonstrates that this
not be straightforward since method, which is not as easily regulated, works
combination with gear to create mortality. The outcome of changing terminal
could be inconsistent (eg, decreasing hook size could decrease mortality with
trolling an increase it with mooching).

capture,
Outcome
Sector
SubSector

results are presented for an location, sea surface temperature, depth of
Objectives met
Hook & Line
Recreational

improved the precision of this comparison. Circle hooks appear to reduce

mortality.
effect of
holding
been
after
4% of
were
a% of

Data on delayed mortality in this study were inconclusive with regard to the treatment type. The strong relationship between short-term mortality and hook wound location was not found for delayed mortality. A strong indication that methods used in this study induced mortality is the fact that no tags have been recovered from the 188 coho and chinook that were tagged and released after surviving the four-day holding period. In contrast, tags were recovered from 4% of fish caught on similar gear in a concurrent gear selectivity study were fish tagged and released immediately after capture. Tags were recovered from a% of fish released after four hours in a 1996 sport hooking mortality study.

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Report #	68.3
ReportTitle	NEAP research -- Final Report
ProjectTitle	Coho bycatch in directed commercial chinook salmon fisheries in Oregon
Author	Doug McNair, Natural Resources Consultants Inc
ReportDate	nd
ProjectYear	1995
Proponents	Pacific Fisheries Management Council

State	OR
Objectives	To estimate coho encounter rate
Gear were coho and	Selective fishing gear and methods. Between 1995 and 1997, 36 contracts established with commercial salmon trollers to report data on encounter of and related variables during directed chinook fisheries off northern, central
Results chinook were averaged boat- legal Coho	Results. In 895 vessel-days of effort over three years, 21,220 legal landed; 10,453 sub legal chinook and 2596 coho were released. Vessels 23.71 legal chinook, 11.68 sub legal chinook, 2.90 coho and 3.22 lost fish per day. In catch rates per legal chinook encountered, these results = 0.49 sub chinook, 0.12 coho and 0.14 lost fish encountered per legal chinook landed.
Conclusions encounter underestimated question the factor	Conclusions. The currently applied methodology for estimating coho rates in the Oregon commercial troll directed chinook fishery has encounters and glass incidental mortality of coho. The study does not provide information about the possible causes of the under-estimation. It does assumption that targeting chinook reduces coho encounters by an assumed
Recommendations	None offered in paper.
Outcome	Objectives met
Sector	Hook & Line
SubSector	Commercial troll

Report # 68.4

ReportTitle NEAP research -- Final Report

ProjectTitle Selectivity of different gear arrays in directed chinook trolled fisheries

Author Doug McNair, Natural Resources Consultants Inc

ReportDate nd

ProjectYear 1996

Proponents Pacific Fisheries Management Council

State OR

Objectives salmon while to test the effectiveness of 3 gear arrays at reducing bycatch of coho targeting chinook salmon with commercial troll gear

Gear 8 Selective fishing gear and methods. For different gear arrays were tested: spreads, four spreads, four spreads with a dummy spread above (a flasher and

for 20 hootchie without a hook) and 3 spreads. For vessels were contracted to fish

Results
coho. Four
demonstrated
Coho
spreads
The first
compared to 8
legal
interaction of

Results. Three spreads = 1.85 coho per boat day. Four spreads = 1.90
spreads with dummy = 2.20. 8 spreads = 6.10. Analysis of variance
gear configuration significantly influenced daily encounters of coho salmon.
encounter is with the first 3 gear arrays were significantly lower than with 8
but coho encounters among the first 3 arrays were not statistically different.
3 arrays were somewhat less efficient in encountering legal chinook
spreads. There was no statistically significant difference in encounter of sub
chinook among gear array types. There was no significant effect of vessel on
encounter of coho, legal chinook were sub legal chinook nor was the

Conclusions None reported.

Recommendations None reported.

Outcome Objectives met

Sector Hook & Line

SubSector Commercial troll

Report # 68.5

ReportTitle NEAP research -- Final Report

ProjectTitle Fishing method selectivity in directed ocean sport chinook fisheries

Author Doug McNair, Natural Resources Consultants Inc

ReportDate nd

ProjectYear 1996

Proponents Pacific Fisheries Management Council

State OR

Objectives of chinook other the could be method. To significantly

Objectives. The study had three goals. To find out whether catch rates salmon could be improved by adapting gear and methods commonly used in areas of the Pacific Northwest (ie, downriggers and light tackle mooching) to central Oregon fishery. To test whether encounter rates of coho salmon reduced with these methods as opposed to the more common trolling test the hypothesis that using flashers and baits of less than six inches

Gear one of four and than mooching

Selective fishing gear and methods. While trolling, rods were rated with terminal gear configuration's: bait less than six inches without flasher, flasher lure greater than six inches, flasher and lure less than six inches, bait greater than six inches without flasher. Since flashers are not used in mooching, to

rods have baits less than six inches and to have baits greater than six inches.

Results	Detailed catch results by gear type are presented in the report
Conclusions CPUE	Conclusions. Chinook CPUE can be significantly increased and coho significantly decreased by using downrigger trolling methods or light tackle mooching methods as opposed to the more commonly used conventional
trolling	methods. Coho bycatch was reduced by eliminating flashers. No statistically
Recommendations	None offered in paper.
Outcome	Objectives met
Sector	Hook & Line
SubSector	Recreational

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Report #	69
ReportTitle	An evaluation of the Dixon Entrance selective pink salmon troll fishery,

\\svbcvanfp01\Cohen-Comm\Personal_Drives\Resource
Management\Gordon Curry\Cohen - Gord Curry\2005\Fi
sheries Management>Selective Fishing\

CAN176467_0158

1999

ProjectTitle	NA
Author	J. O. Thomas
ReportDate	nd
ProjectYear	1999
Proponents	Northern Trollers Association
State	BC
Objectives pink salmon encounters on the to	Objectives. To explore the economic feasibility of selectively harvesting while avoiding non-target species, especially coho stocks. To mount an economically viable but responsible pink salmon fishery by minimizing with coho. To monitor species encounter rates and coordinate the troll fleet fishing grounds to avoid areas of high coho abundance while targeting effort areas of pink abundance. To collect biological data on coho including tissue
Gear salmon gear project. barbless	Selective fishing gear and methods. The troll fleet used standard pink and fishing techniques to minimize bycatch of other species during the Standard fishing gear included flashers, red or pink colored hootchies and
Results coho was directly encountered Overall been Total	Results. Detailed data are presented in the report. Overall, the pink to encounter rate was 8:1 -- 5:1 in July and 17:1 in August. The overall ratio influenced by the large amount of effort and related abundance of coho in Area 101-4 in July. 43% of total coho captured were in this area and time. coho interceptions would have been reduced significantly if this area had avoided in July. High effort in July harvested only 21% of the total pink catch. catch = 34,197 pink; 4161 coho; 776 chinook; 561 chum; 169 sockeye; and 2 steelhead. Fishing time and area selections were at the discretion of vessel operators. This resulted in a disproportionate amount of effort in a few sub-

areas, not all of which were sampled in all periods. On ground communications
 among vessels and with DFO managers were intended to reposition trollers away
 from coho concentrations. The catch data indicate that optimal sub-areas and time
 periods exist to harvest pink salmon with low bycatch of coho. Sub-Area 101-
 3 had the highest concentration of pink salmon to coho for all sampled areas during
 July and August. All sampled areas except 101-3 and 101-9 displayed relatively
 high abundance of coho during July. Sub-areas 101-4/5/8 yielded relatively low
 abundance of pink salmon and accordingly did not provide viable economic
 opportunities in July. Sub-areas 101-6 and 101-10 were not sampled in July.
 Overall encounter data suggests that sub-areas 101-4/5/8 should receive less effort
 during July. Vessel and tack specific data, however, reveal a disparate pattern of
 pink abundance. The catch success exhibited significant variability over time and
 area emphasizing the difficulty of achieving program objectives during July.
 Relatively high abundance of coho in July identifies these areas as major rearing and/or
 migration corridors for coho salmon. Late August provided a broader range
 of more economically viable opportunities. Sub-areas 101-3/4/8 had the highest
 relative abundance of pink to coho salmon. Sub-areas 101-6/9 provided similarly
 the encouraging economic results in August. Based on high incidence of coho in
 economically-viable catch, sub-area 101-10 did not meet the goal of responsible nor
 and 8.2% fishing. Mortality of coho landed dead at the boat was 6.6% (5.9% in July
 by an in August). The increase in coho mortality from July to August was matched
 lethargic even greater proportional increase in the number of coho observed to be
 (4.7%-11.2%). Although mortality rates were observed to increase over time,
 number of proportionally more coho would have died in July because of the greater
 during this coho encounters. Including dead and lethargic fish, total coho mortality
 Conclusions Conclusions. This study demonstrates the viability of selectively
 harvesting pink salmon in Dixon Entrance. 87% of fish captured were target species (pink);

10%
proportionate

were coho. During August, with improved pink catch per effort, the

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Report # 69

release.

samples for DNA stock identification and observations of fish health at

Recommendations
incidence of coho.

Recommendations. Avoid sub-area 101-4 in July due to the high

abundance of

Sub-Area 101-10 should not be fished in August due to relatively high

pink, will

coho. Prospecting, necessary to identify areas of economically abundant

vessels

inevitably encounter problematic fishing locations. Trigger points, defining unacceptable pink and coho encounter rates, are required to clearly illuminate problematic fishing areas. Such rates would be instrumental in directing

daily

away from coho sensitive areas. Once established and incorporated into the

process of

conference between the fleet and DFO, trigger points would simplify the

area. A

identifying both an economically viable and biologically responsible fishing

conducted

more structured and comprehensive selective fishery in 2000 should be

to verify the results of the 1999 study and assess all sub-areas adequately. A

more rigorous sample design would direct fishing effort to all areas. The number of boat-hours should be increased to adequately assess all of the areas simultaneously and to target specific sub-areas to increase pink catch and reduce coho bycatch. It is unlikely that the number of vessels used in 1999 could do this. At least 10 vessels should be operating in the sub-areas. A more detailed sampling program should be initiated to assess factors affecting coho mortality. The present study did not fully assess mortality factors. The data suggest it is possible to reduce mortality rates by vessel but the reasons some vessel operators demonstrated low mortality rates are unknown. At a minimum, such investigations need to assess the relationship of coho mortality to pink catch per effort, coho size and sexual maturity. Coho DNA samples should continue to be collected and the results incorporated into-

Outcome Objectives met

Sector Hook & Line

SubSector Commercial troll

has share of coho dropped to less than 6% of the overall catch. Use of red gear and been observed to reduce coho catches compared to standard coho spoons and hootchies. Study catch data suggest that coho catches were likely reduced

by over
50% by use of red gear when compared to nearby Alaskan fishery results.
Historical
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ve
deployments can be an effective management tool. The data suggest that
the best
economic gains through selective harvest of pink salmon will be realized in
August.
Regarding economic viability, the abundance of pink encountered during the
study
provided modest financial return. Discussions with troll operators suggest
that daily
catch averages of about 650 pieces are necessary to make the Dixon
Entrance pink
fishery viable. Pink catches need to double to achieve this target. The data
suggest
significant increases in catch and possibly in reduction of coho bycatch could
be
achieved by targeting select sub-areas for each harvest window. A more
structured
fishing plan should be designed to verify these preliminary results. The data also

Report #	70
ReportTitle	Modified Baltic gillnet selectivity and mortality study
ProjectTitle	NA
Author	J. O. Thomas
ReportDate	February 2000
ProjectYear	1999
Proponents	Heimo Piirola
State	BC
Objectives anticipated	Objectives. To test a modified gillnet known as a Baltic net. It was also that use of a Baltic net would provide an exceptional, unmarked product for sale.
Gear	Selective fishing gear and methods. Each of three fishing vessels at a

Baltic (test)
that tangle
in the
net is
mesh
trap fish.
in their
net
panels were
made of
fish. The
on net

net and a traditional (control) net. A Baltic net is composed of three layers
fish as opposed to gilling them. Unlike tangle nets, however, where the slack
net comes from a high horizontal hang ratio, the excess webbing in a Baltic
hung vertically. A small mesh inner layer is held slack by two shorter large
outer layers. The small mesh of the inner panel ensures that large fish are not
killed. The outside layers act not only to keep the inner net slack but also to
The Baltic nets differed in the materials used in their construction as well as
dimensions but all served the purpose of a tangle net. All three of the Baltic
panels were connected to a common weedline and lead line. The inner
constructed of four inch mesh. The degree of slack in the middle panel was
dependent on the depth of the shorter, outer panels. The outer panels were
24 inch mesh enacted to keep the inner panel slack is well as to restrain
vertical hang ratio of the nets ranged from 1.1: 1 to 2.4: 1. Additional details

Results
nets. One

Results. Problems were encountered immediately with two of the test

was impractical because the small mesh was two-week in the large mesh was
constantly getting tangled. Tangling and difficulty working the net was also a
problem for a second net. Few sets were made during the study to test the
effectiveness of either of these nets. Because of conservation-based time

and area

closures, vessels were not allowed to fish places of high concentrations of
restricted species. With few chinook, coho or steelhead encountered by

either the

traditional or Baltic nets, it is difficult to assess the selectivity of the Baltic

nets.

Results of this study do demonstrate, however, that the traditional nets out

fished

the Baltic nets except in one case. Overall, the traditional nets caught an

average of

16.2 sockeye, 17.9 pink and 2.6 chum per set while the Baltic nets caught

8.1

sockeye, 2.3 pink and 0.2 chum per set. Each control net encountered some

coho

but only one caught any. A modified Baltic net was fished 16 sets at the end

of

August. The modified net caught more pinks on average than any other net

in the study but also far more coho. The modified net caught 25 times more coho in
16
Conclusions Conclusions. It is difficult to assess whether the Baltic nets were
selective. Only three coho and one chinook were caught by the Baltic nets in 37 sets.
Traditional nets caught a higher proportion of target to non-target species than did the
Baltic nets. The average catch of the modified Baltic net far exceeded that of the
traditional or Baltic nets but it also had the lowest ratio of target to non-target species of
the three net types. Control nets of fished even the most effective Baltic net.
Because of few encounters with non--target species, it is difficult to determine the
selectivity of the net or its ability to allow for the release of bycatch unharmed. Despite
problems with the test nets the Baltic net has potential. The fish taken from these nets
were

Recommendations Recommendations. Further testing is recommended to determine
the selectivity of the Baltic net, especially the one design that seemed most effective. Baltic
nets should be made with a strong inner mesh to contain the fish. Similar nets,
one with lighter color outer panels, the other with darker outer panels, should be
fished to see if fish are deterred by the color of the large mesh panel. Similar nets
should be tested with and without standard mesh and panels to determine whether they
are

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Outcome Needs further study

Report # 70

Sector Gillnet
SubSector Baltic net

construction and materials are provided in the report. A

entire sets and all of the other nets combined caught in 134 sets throughout the study.

and described as troll-caught in quality and appearance. The fish were unmarked had very little scale loss resulting in greater value.

more necessary to maintain the slack within the net. All nets should be tested for
 nets. The than one day. Similar data for should be used for both the control and test
 release. The condition of fish caught in the nets should be recorded at catch and a
 selectivity. nets should be tested in areas of higher coho concentrations to test their
 fished The modified Baltic net is not acceptable for fishing because, although it out
 nature of traditional nets, it also resulted in higher coho mortality. The size-specific
 interesting the modified Baltic net (gilling smaller pinks and tangling larger coho) is
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ed
 set time; there must be a control net fishing at the same time.

Report # 71
 ReportTitle Refinement of mesh and twine size for a small mesh tooth tangle net --
 Final Report
 ProjectTitle NA
 Author Mark Petrunia
 ReportDate February 2000
 ProjectYear 1999
 Proponents Mark Petrunia
 State BC
 Objectives multi-strand Objectives. To determine the optimal mesh and twine thickness of a
 catch and tooth tangle net that would generate a significant decrease in non-target

other
 River
 and girth
 Gear
 four
 consisted
 consisted
 fathoms in
 3 1/2
 #23
 fathoms
 Results
 species of
 size
 postponement of
 caught.
 inch net
 net was
 mesh size
 of the
 twine
 #16 =

mortalities while maintaining a commercially-viable catch of target species. To obtain coho DNA samples to enable DFO to increase run timing data and information on endangered Thompson River coho as well as other Fraser coho stocks. To take DNA samples, spaghetti tag and measure fork length

Selective fishing gear and methods. To multi-panel nets each consisting of four panels. One net consisted of four panels of different mesh size; the other of four panels of different twine thickness. The multi-panel mesh size net of 2 3/8 inch, 2 3/4 inch, 3 1/8 inch and 3 1/2 inch mesh, each panel 25 length made of #19 multi-strand nylon hung at 3: 1 and of equal depth as the inch 120 mesh panel. The multi-panel twine thickness net included #16, #19, and #26 multi-strand nylon, 3 1/2 inch mesh size, 120 meshes deep, 25

Results. The 3 1/2 inch net was the most successful in catching all salmon but all net mortalities sustained by coho were due to this net. As net size decreases, total catch of each species also decreases. Due to the postponement of the project's start date caused by the Fraser River Sockeye disaster, data on sockeye, pink and chinook salmon is limited due to the small number of fish caught. Mortality in the three smallest mesh nets = 0%. There was also a noticeable decrease observed of fish having their mouth closed shall as the net size decreased. The 3 1/8 inch net had one-third less chum catch than the 3 1/2 inch net but it is questionable if this decrease in mesh size would be required in a "commercially viable fishery" since net mortality of coho with the 3 1/2 inch net was only 2.4%. The ability to mend and repair a net becomes more difficult as decreases. The most influential impact on coho survival is the length of time set there was a decrease in the number of fish caught as the thickness of the twine in the net increased. Coho mortalities were seen in three of the four panels. #16 = 66 coho caught; to mortalities; 3.0% mortality rate. #19 = 48 caught; to

mortalities; 4.2% mortality rate. #23 = 31 coho caught; 1 mortalities; 3.2% mortality rate.
If #26 = Conclusions. As mesh size decreases, the number of fish caught and
net mortality rates decrease. As twine thickness increases, the ability of the net to catch
fish decreases. The vast majority of fish held in a net pen seemed to survive the
catch- and-release from the tooth tangle net. A live fishery can increase the
monetary value

Recommendations Recommendations. We were unable to obtain conclusive data on
the two four panel nets with respect to sockeye, pink and chinook salmon catch performance.
These nets therefore need to be tested during a time of sockeye abundance. Tooth
tangle nets need to be compared to regular sockeye net of approximately 5 1/4 inch
multi- strand nylon mesh. The author recommends a 3 1/2 inch #19 multi-strand
nylon

Outcome Needs further study

Sector Gillnet

SubSector Tooth net

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Report # 71

ReportTitle 1999 fall chum selective fishing program -- Final Report

ProjectTitle NA

Author Russell Jacobson

ReportDate January 2000

ProjectYear	1999
Proponents	Russell Jacobson
in a net	of all steelhead caught. To investigate medium-term survival by holding fish
State	pen for 16-24 hours. BC
Objectives	To test a modified gillnet for catching chum salmon while allowing non-
target coho	and steelhead to pass through.
Gear	Selective fishing gear and methods. A modified gillnet consisting of a large
fathoms	weedline for the top portion with regular chum gillnet on the bottom. 100
web;	long. Sixty fathoms of conventional net was used as a control. Top = 9 inch
deep.	gauge = 73; 16 meshes deep. Bottom = 6 inch net; gauge = 33; 39 meshes
net. Hang	The depth of this net equals the depth of a normal 6 3/4 inch conventional
tangling	ratio = 2.2: 1. The reason for the hang ratio was to prevent fish from over-
chose	and to allow non-target species to pass. We chose 6 3/4 inch web on the
Results	Results. Both nets appeared to catch each species of salmon, excluding
steelhead	which were only caught in the conventional net. The net with the longest
soaking	time caught the most fish. The catching ability for chum of both nets was
more	approximately equal. The test net did not catch any steelhead but it caught
Conclusions	Conclusions. The test net appeared to catch chum with the same
efficiency as a	conventional net. This further adjustments could be further improved.
Although the	test net did catch coho, the numbers were substantially fewer than what was
caught	
Recommendations	Recommendations. Increase the depth of the test net by about 10
meshes to	increase the catching chum's without affecting the catch of non-target
species. The	test net in the conventional net should be the same length for comparative

gear purposes. Test fishing should started earlier, perhaps October 5-10. If this
 were implemented in the commercial fishery the length of the net should be
 so shortened from 200 fathoms to 150 fathoms to decrease soap time. Optimal
 Mesh time = one-half hour period net wedding should be no finer than 27 gauge.

Outcome Objectives met

Sector Gillnet
 tooth tangle net for commercially viable fishery targeted on chum salmon.

SubSector Weed line

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Report # 74
 ReportTitle Steelhead telemetry study
 ProjectTitle NA
 Author Jim Renn
 ReportDate February 2000
 ProjectYear 1996
 Proponents MELP
 State BC
 Objectives over wintering Objectives. To improve the level of understanding of migration timing,

and spawning areas, and Stock composition of fall-run interior Fraser River steelhead. To provide information to assess the effects of handling and radio

Gear Selective fishing gear and methods. Steelhead captured during commercial salmon openings were radio-tagged in Johnstone Strait and on the southwest coast of Vancouver Island. Steelhead were also captured and radio-tagged in the Fraser River in experimental salmon fisheries (tangle net, beach seine and fish wheel) and

Results variable and is Results. The fates of radio tags deployed from 1996-1999 is highly likely indicative of annual environmental variations, variation in the types of radio tags used, and variations in tag deployment methods. Details are provided in the report by year and fishery. A large percentage of radio-tagged steelhead captured via tangle net travel primarily downstream after being handled. There appears to be an inability of anglers to capture Chilcotin steelhead and a tendency for anglers to capture Thompson steelhead. The reverse appears to be true of the Yale fish wheel. 26% of steelhead radio-tagged at the fish wheel were Chilcotin stock but only 11% were Thompson stock. This may be misleading, however, since the fish wheel did not have radio tags available for deployment in the latter half of October when Nicola steelhead appear to migrate through the Fraser Canyon. The tangle net appears to have the largest percentage of its radio-tagged steelhead enter a spawning tributary in late-September and early-October when water temperatures are warmest. In 1996 and 1998, the proportion of steelhead radio-tagged by anglers that entered a recognized spawning tributary did not seem as dependent on the time of year as the tangle net. It appears, however, that steelhead radio-tagged by anglers in late-October and early-November are least likely to enter a recognized spawning tributary. Steelhead radio-tagged by the Yale fish wheel during the second week of October have the highest-rated success at entering a recognized spawning tributary.

September gear Unlike the 1996 tangle net, steelhead captured by the fish wheel in late appear less likely to reach a recognized spawning tributary. Similar to other

Conclusions None provided

Recommendations None provided

Outcome Objectives met

Sector Hook & Line

SubSector Recreational

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Report # 75

ReportTitle 1999 Lower Skeena River sport fishery monitoring program technical report

ProjectTitle NA

Author J. O. Thomas

ReportDate February 2000

ProjectYear 1999

Proponents J & S Outdoor Adventures Ltd

State BC

Objectives Objectives. To determine the magnitude and incidence of coho catch

(harvest +
Terrace
mortality,
of coho.
Gear
at 9
including
gear.
Results
65% of
passively, 2%
harvested,
coho and
Significant
probabilities
caught
coho
higher
catch
at one
injury. Of
landings
died

release) in the sport fishery on the lower Skeena River downstream of
between July 26-August 7 1999. To determine potential coho post-release
factors contributing to this mortality, and factors contributing to the selection
Selective fishing gear and methods. Intensive on-site monitoring of anglers
sport fishing sites to provide direct hourly observations of fishing activities
angler effort, catch, assess condition of fish at landing, fishing methods and
Results. 74% of anglers targeted chinook, 18% pink and 4% steelhead.
anglers used Fluor's, 22% flies and 13% date. 74% of anglers fished
fished by spin casting and 22% by fly casting. At monitored sites: 12 coho
80 released; 377 chinook harvested, 81 released; 108 pink harvested, 147
released; 8 steelhead harvested, 103 released; 107 sockeye released. No
significant differences were found in comparisons of daily catch rates for
all other species combined at to sites indicating no species selectivity.
differences were found at all other sites indicating significantly higher
of catching species other than coho at these other sites. Few coho were
compared to other species for all monitored sites combined where the ratio of
catch to other species combined was estimated to be 0.17: 1. Relatively
ratios were observed at 3 sites on the lower River where, on Sundays, coho
rates were higher than catch rates for all other species combined particularly
site. Condition at landing was assessed for 45 coho at monitored sites using
anomalous scale from 1-5 indicating combined characteristics of vitality or
45 coho landed, 28 were assessed as vigorous with no bleeding. All other
were assessed at conditions that could result in mortality. Based on this
assumption, 36% of 80 coho estimated released at monitored sites (29 coho)
as a result of fishing encounters. An additional 12 coho were estimated to be
harvested these sites yielding total coho mortality estimated = 41 fish at

monitored
and
hook
relative
power

sites. Data on several factors with potential effects on both landed condition selectivity were collected including fishing methods, terminal gear (attractor), size, hook location and play time. Although there is some indication of the contribution of these factors, small sample size for coho disqualified higher analysis of these contributions. Non-parametric tests found no significant

Conclusions None provided

Recommendations None provided

Outcome Needs further study

Sector Hook & Line

SubSector Recreational

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Report # 76

ReportTitle Yale fish wheel program -- 1999 final report

ProjectTitle NA

Author Yale First Nation Fisheries Stewardship Authority

ReportDate January 31 2000

ProjectYear 1998

Proponents Yale First Nation

State BC

Objectives salmonids in the and in the stocks. gillnets, migrating species of in

Objectives. To test fish wheels as a method of capturing migrating Fraser Canyon during the spring and summer during periods of rising water spring freshet. To increase the role and responsibility of Fraser First Nations annual and in-season assessments of Fraser River salmon and steelhead To assess the acceptability to First Nation fishermen, who traditionally use of fish wheels as a method of capturing abundance stocks of in-river salmonids for harvest, and acceptability of these fishermen to release concern (eg, coho and steelhead). To assess the potential role of fish wheels

Gear the pontoons (38 Each bottom of nylon web basket 10 feet like a under the rolling upright, the hand. padded recorded, hang which wire

Selective fishing gear and methods. The Yale fish wheel is modeled after Nisga'a fish wheel, the most successful model to date. To aluminum feet long) supported axle that has three baskets extending outward from it. Each pontoon has a live well inserted through it. River water flows in through the each live well which is 4.5 feet deep. Each basket is covered in knotless and has a plywood slide at the bottom of lines up with the live wells when a reaches upright position. The baskets extend 11 feet from the axle and are wide. The River current pushes against the baskets propelling the around Ferris wheel. Each basket hangs upside-down in the water as it rotates platform. Fish swimming up-river are caught in a basket and scooped up, toward the slide as the basket rises out of the water. When the basket is fish slide off into alive wells where they can rest before being dipped out by Fish that are to be tagged and bio-sampled are carried in the dipnet to a trough for water while non-target species are counted, sex and species and released immediately. The platform has 20 foot high power from which two blocks. Mounted on the masts of the tower are to hand which is from

the axle rope runs up through the blocks and down to the booms where the ends of

Results condition not the Results. 26,026 salmon were caught in 1999. 97% of the catch were in #1 (vigorous). Nearly all of the #2 and #4 (bleeding) fish were wounded by seals

Conclusions spring wheel fish is Conclusions. The Lady Franklin site is extremely hazardous during the freshet. Anchor pins must be installed above the highest watermark if the fish is to be operated during freshet and high water. The ideal speed for catching fish is 60-76 seconds for the baskets to turn three revolutions.

Recommendations wheel and its Recommendations. Specific recommendations concerning the fish operation are contained in the report.

Outcome Objectives met
Sector Alternate
SubSector Fish wheel

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Report # 77.1
ReportTitle Fish Fraser River Fishermen Society--Floating Fish Trap and Power-Assisted
ProjectTitle Floating fish trap
Author Nancy Manuck
ReportDate January 2000

ProjectYear	1999
Proponents	Fraser River Fishermen Society
State	BC
Objectives River.	Objectives. To test and catch fish with a floating fish trap in the Fraser River.
Gear rigid of trap.	Selective fishing gear and methods. Constructed in 1998 of lightweight, aluminum for strength and your ability. It is easily mobile under tow. The use of knotless webbing prevents scale loss. There is a working deck around the trap.
Results catch data	Results. Catch data available in associated report by J. O. Thomas. No are presented in this report.
Conclusions any species of nets the trap.	Conclusions. A floating trap was effective of capturing and releasing salmon without any were or minimal stress modifications to the ramp lead system and extension of the throat were very important to the efficiency of The trap is easily mobile. Seals spotted in the river showed no interest in the trap
Recommendations all species are tested system on fishing boats, one trap, we salmon	Recommendations. The trap needs to be tested in a window when present in the river. The trap could be tested for stock assessment purposes especially when endangered species are present. The trap needs to be when there is a large run of salmon in the river. With the ramp net lead the trap we recommend to shallow up the entrance of the trap to best suit the spot that is chosen. To complete this test we would tow the trap with two on each side of the wings. When it is apparent that enough fish are in the would then close the trap and swordfish. Further monitoring of live captured
Outcome	Objectives met

Sector Alternate

SubSector Fish trap

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Report # 77.2

ReportTitle Fraser River Fishermen Society--Floating Fish Trap and Power-Assisted Fish

ProjectTitle Power-Assisted Fish Wheel

Author Nancy Manuck

ReportDate January 2000

ProjectYear 1999

Proponents Fraser River Fishermen Society

State BC

Objectives Objectives. To test and catch fish with the power-assisted fish wheel in

the Fraser

Gear
horsepower

to control

foam

baskets

and

ramp net

As the

slide

Results
net lead

during the

fish were

frame

fishing.

dipping

down

Conclusions
releasing any

Recommendations
in a window

the

including

fishing

Selective fishing gear and methods. The wheel is powered with a 60 gas engine running a 285: 1 reduction gear with a hydraulic selective valve to control the speed the wheel. The wheel is on aluminum pontoons better pump full of foam in case of a puncture. The frame is constructed of aluminum. There are four baskets with knotless webbing. There is a working deck around the trap for the crew and observer. The wheel is first secured and anchored into position than the leads are set and anchored. The fish follow the lead nets opt for the wheel. As the fish come up the lead nets they are scooped up by the baskets. The fish then

Results. Catch data are presented in an appendix to the report. The ramp system work very well. Fish appeared to be shying away from the wheel during the day. At night, the wheel had much better fishing results. We realize that the shying away from the wheel to the reflection of the aluminum baskets. The frame was sprayed painted black in this improve the wheel's performance in day fishing. Fish were discovered to be escaping out the sides of the wheel between a dipping of each baskets. Frames of knotless webbing were constructed and dropped down

Conclusions. The power assisted wheel is effective capturing and releasing any species of salmon without any were very minimal stress.

Recommendations. The power-assisted fish wheel should be tested in a window when all species are present in the river. The wheel should be used for stock assessment. The wheel should be fish when there is a large run of salmon in the river. Further monitoring of live captured salmon should be completed including stress level testing. The river needs to be mapped and surveyed for the best fishing

Outcome Objectives met
Sector Alternate
SubSector Fish wheel

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Report # 78
ReportTitle Selective gillnet drop weedline
ProjectTitle NA
Author Dave Kadyschuk
ReportDate February 2000
ProjectYear 1999
Proponents Dave Kadyschuk
State BC
Objectives To try to avoid catch of non-target species.
Gear length by 60 Selective fishing gear and methods. 6 3/8 inch mesh by 150 fathoms in meshes deep. The net was split into two parts. The control part of the net

<p>was 50 drop- ft. minute</p>	<p>fathoms long and 60 meshes deep. The test par the net was hung on a 5 ft. weedline and was 100 fathoms long and 60 meshes deep in addition to the 5 drop. The panels were fished on alternate days. The gear was set at 15</p>
<p>Results caught. Most observer from project. and</p>	<p>Results. They were compiled on a section of the net in which the fish were Most of the fish were caught between the middle in the bottom of the net. steelhead were caught near the surface. Data were collected by and Archipelago Marine Research and forwarded to DFO upon conclusion of the project. The gear fished well and was successful in catching the target species: chum salmon. There was minimal mortality of non-target species to short set times and the user revival tanks which work extremely well. Throughout the project we</p>
<p>Conclusions fish of all well in weedline</p>	<p>Conclusions. With short set times there is a very high survival rate of species. The revival tank we used with continuous water flow work extremely well in keeping fish alive for long periods. The drop-weedline turned out to be very functional, capable of being set out and picked up no problems. The drop is an excellent method of fishing particularly during steelhead migration. It is a</p>
<p>Recommendations steelhead migration's also be use of species alive the 5 ft. increase caused</p>	<p>Recommendations. The project should be repeated during (September 1-October 1). Using different mesh sizes in this project would significant because this would also be a factor in selectivity of species. The revival boxes demonstrated to be very effective in keeping non-target and well for release. A larger drop on the weedline is also recommended as drop Missouri manageable. A 7-8 ft. drop should be attempted to further the selectivity of the gear. Seal predation disrupted much of the testing. This much net damage as well as destruction of fish. The seals seem to be more</p>
<p>Outcome</p>	<p>Objectives met</p>

Sector Gillnet
SubSector Weed line

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Report # 79
ReportTitle Ditidaht selective fishery project -- reef trap/mini-seine
ProjectTitle NA
Author Seaton Taylor
ReportDate December 1998
ProjectYear 1998
Proponents Ditidaht First Nation
State BC
Objectives
surpluses of Objectives. To develop methods of selectively harvesting targeted
and chinook and chum salmon while releasing non-targeted species such as coho
provide job steelhead with zero mortality. To operate as a stock assessment tool. To
food fish opportunities for Ditidaht First Nations people. To provide premium quality
Gear Selective fishing gear and methods. The reef trap was based on a

traditional design. The basic design has to lead wings that died migrating salmonids through a trough-like structure and then into a bag, in this case and net pen. The trap was built using 3 1/4 inch knotless seine web with gillnet quirks on the top and West Coast lead line on the bottom. The net pen was a 20 ft. by 40 ft. log pen with re-bar stanchions to hold the net about the water line. Entire structure took 15 minutes to set. To seine nets were used, each 300 feet long, 125 feet deep, the other 50 feet deep. The shallow net was used for small sets in shallow water at the tail end of the Lake for sampling and tagging. The deep net was used the capture large numbers

Results mini-seine Results. Only 2 chinook were caught in the reef trap. Catch data for the chum; and are presented in the report. The mini-seine caught 7000 chinook; 34,747 209 coho. 211 chinook; 1503 chum and tuner and 6 coho are released. The remaining fish were provided to Ditidaht band members as food fish or sold.

Conclusions Conclusions. Some general conclusions are provided in the report.

Recommendations Recommendations. Construction of two new seine nets is recommended one being one strip deep (3 1/4 inch mesh) for the shallow Nitinat Flats area, the other being 1.5 strips deep (herring seine mesh) for setting deeper areas of the lake. Using herring-sized mesh would reduce the number of mature mail chum salmon that get hung up in the net by their teeth. Larger, deeper openings at both ends of the pen would improve the movement of fish in and out of the pen allowing for improved handling. To maximize the benefits of stock assessment, fishing areas need to be standardized. Other detailed recommendations on tagging, data collection and

Outcome Objectives met

Sector Alternate

SubSector Fish trap

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Report # 80

ReportTitle A review of hooking mortality rates for marine recreational coho and chinook salmon

ProjectTitle NA

Author Steve Cox-Rogers; Terry Gjernes; Elmer Fast

ReportDate April 1999

ProjectYear 2

Proponents Various

State Various

Objectives hooking recreational The purpose of this report is to outline current knowledge regarding mortality as it relates to coho and chinook salmon captured in marine recreational

Gear Various sport gear

Results the Results. Studies conducted over the past two decades have shown that the estimated mortality rate of released Pacific salmon can be quite variable,

from 5% to over 30% in tidal waters. In each of these studies, hook location was found to be the variable most associated with mortality. In general, salmon caught using trolling techniques are often hooked in the outer mouth and jock area while salmon caught using mooching techniques are often hooked in the deep mouth and throat or gullet area. Although the results are not conclusive, it appears that chinook and particularly coho salmon released from sport trolling gear may survive a higher rate than do

Conclusions Alaska, it is evident that hooking mortality can be quite variable for the same salmon species captured on similar gears in different areas. Hooking mortality for coho and chinook in marine recreational fisheries various from 5% to over 30% along the Pacific Coast. The Chinook Technical Committee (1997), in its review of the main factors contributed differences in hooking mortality rates for chinook derived from agency reviews of recent studies identified the most important mortality factors as: 1) hook

Recommendations mortality for coho and chinook is likely dependent upon gear and methods used. Region-wide hooking mortality rates are not appropriate. For BC marine recreational fisheries, assumed hooking mortality rates for coho and chinook assessment/management modeling should take into account gear and method differences. Assessment programs should be developed to quantify gear and method-specific hooking mortality rates for coho and chinook in major BC marine recreational fisheries were information is lacking. Creel surveys should routinely collect information on fishing methods used in specific fisheries. Assessment programs should be considered to

Outcome Objectives met

Sector Hook & Line

SubSector Recreational

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Report # 81

ReportTitle Adult chinook salmon behavior and survival after catch and release from
purse

ProjectTitle NA

Author J. R. Candy, E. W. Carter, T. P. Quinn, B. E. Riddell

ReportDate August 1996

ProjectYear 1990

Proponents Fisheries and Oceans Canada

State BC

Objectives
survive To improve estimates of the proportion of released chinook salmon that
capture in purse seine fisheries.

Gear
track fish Selective fishing gear and methods. Ultrasonic transmitters were used to
after capture and release from commercial seine vessels. Few studies have
used telemetry to estimate salmonid survival after release from fishing gear. By
using telemetry, we avoided the potential additive stress of the artificial conditions

of holding experiments which can bias mortality estimates and the compounding effect of tag loss or non-return inherent in external tag-and-release studies. In addition, we obtained information on chinook salmon movements after release that was important for determining the potential for recapture following release. Two landing procedures were evaluated: "stern" in which chinook salmon were taken from the deck after the catch was pulled over the stern of the vessel (typical of smaller commercial sets) and "side" in which fish were dipnetted from the seine net when it

Results. Stern-landed fish showed a greater degree of external injury than side-landed fish but no relation was detected between injury category and mortality. Once released, chinook salmon showed a range of escape responses from an initial deep dive near the release site to rapid or slow horizontal movement near the surface. On the basis of horizontal and vertical movements, we inferred that 6 fish died. Three additional fish were likely to a died a were lost a depth near the limit of the transmitters before they could be confirmed on the bottom for more than two hours. Data were pooled into two groups: mortalities (confirmed and suspected) and survivors (known survivors and lost fish). Survival rate varied among sampling years: 1990 = 100%; 1991 = 64%; 1992 = 88%. Interactions of fish size, landing procedure, landing time, injury category, and seine catch size on survival were tested. The only significant effect was that mortality increased with longer landing times. As landing time increased, the proportion of chinook salmon that survive capture and release decreased. Landing time was significantly greater for side-landed and larger catches. The overall survival estimate = 77% at 24 hours (95%

Conclusions. A suggested method to reduce incidental catch mortality of chinook salmon is to dipnet them from the pursed seine net (Rowse 1988). Our results indicated that longer time in the net may cause physical exhaustion that may be

and- lethal more often than a quicker release from a stern-landed catch. A catch-
fishermen. release fishery in Johnstone Strait would depend on the cooperation of
carefully For our estimated survival rate, we assumed that fish were quickly and
may not released after being landed. We dipnetted fish from the pursed net which
after be practical during a commercial fishery. If fish were retrieved from the hold
be being brailled on-board were roughly handled before release, mortality might
reduced, much higher. However, mortalities may be minimized if handling time is
determined that particularly from sets was small catch sizes. The observer program
Strait that for 1986-1990, an average of 68% of purse seine sets in upper Johnstone

Recommendations Recommendations. Assuming responsible handling by their
captors, chinook salmon mortality due to incidental catch in the Johnstone Strait seine fishery
could be considerably reduced if an non-retention policy were implemented.
However, it would have drawbacks such as the difficulty of determining accurate seine
fishing mortality and lost opportunity to sample fish for biological information such as
size,

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Sector Seine
SubSector Brailing

Report # 81

seine vessels in Johnstone Strait, BC

ReportTitle Fifty Years of Selectivity in the Fraser River Gillnet Fishery

ProjectTitle NA

Author Michel Drouin & Allan Regier

ReportDate March 2000

released over
ProjectYear 2

Proponents Pacific Initiatives

State BC

Objectives with regard
were
conservation of

Gear to
managers and
remember
was

Results was first
gillnet)
Pearce
determined
smaller
the

was held alongside the vessel once a majority of the catch had been

Objective. To document the evolution of the Fraser River gillnet fishery to selectivity and to identify changes that were made to the fishery, why they were made, and their results. The focus is on measures taken to address conservation of

Selective fishing gear and methods. The primary method of research was to interview elders from fishing industry. Commercial fishermen, fishery managers and native elders were interviewed to gather historical data from people remember historical changes because they were involved in them. Archival research was

Results. Activity is not new. Selectivity of the Fraser River gillnet fishery shown quantitatively by comparison was of length measurements of sockeye salmon from United States (non-selective traps) and Canadian (selective fisheries (quoted by Gilhousen from a 1914 report by Gilbert). Wilson and Pearce (1984) tested three mesh sizes for selectivity of chinook salmon. Wilson determined that a 14 cm mesh was effective in reducing bycatch of large chinook: "a smaller size would have no positive effect on chinook by-catch and would increase the relative harvest of female pink and sockeye salmon." Wilson and Andrews

(1987)
 coho
 net)
 by their
 Fraser river

found that CPUE in test nets was greatest for all species including chinook, and sockeye in net panels on 3:1 and lowest in panels hung 2:1. Despite widespread opposition, monofilament-style nets (Alaska twist: a six-strand) were introduced in North Coast fisheries in 1997 followed shortly thereafter by their introduction in Johnstone Strait and the West Coast of Vancouver Island. Monofilament nets are still not permitted in the Fraser river. In 1952, the

Conclusions NA

Recommendations NA

Outcome Objectives met

Sector Gillnet

SubSector
 age and stock composition.

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Report # 83.1

ReportTitle A review of the subject of hooking mortalities in Pacific salmon

ProjectTitle NA

Author Sam Wright

ReportDate 1970

ProjectYear 2

Proponents Sam Wright

State	Various
Objectives manage and if scientific of subject of	Objectives. "If chinook and coho resources are to be intelligently attempts to develop proper regulatory tools through excepted methods of analysis are to be successful, the true rates of hooking mortality for given set conditions must be pinpointed within relatively narrow confidence limits." The objective of this paper is to present and evaluate available data on the
Gear	Sport gear
Results to 7.0% range from estimates 11.7% Mortality yields coho greater greater depths group yields experiments are f a entirely... as	Results. Estimates of immediate hooking mortality rates (DOA) ring 0.5% (pp. 48-49). Estimates mortality determined from short-term observation 0.7% to 23% for chinook and 0.0% to 19.7% for coho (p. 49). Mortality based on extent of injuries range from 13% up to 50% for small chinook; from to 20.8% for coho; and from 83.4% to 19.9% for pink salmon (pp. 50-51). estimated for chinook salmon from data on the condition of fish at capture 12% mortality (based on many assumptions, p. 52); a similar estimate for salmon = 9% (p. 53). This evidence indicates that while coho may exhibit physical damage from hooking, this is not necessarily cause a significantly hooking mortality than for chinook. Chinook are generally hooked a greater and coho and this could conceivably neutralize any advantage gained by less external physical damage. Mortality estimates for coho salmon from control experiments are 36%-38% (p. 54). Evidence from a series a similar studies coho mortality estimates around 16% (p. 55). Data from control group using traps instead of seines are discussed but no mortality rate estimates provided (p. 56). Data on the incidence of hook scarring "raise the question o possible source of hooking mortality which is additive to the rate normally considered by investigators" (p. 57). Since coho are harvested almost three-year-olds in their final year..., the increase in the rate of scarring must

be attributed primarily to fish escaping from gear as opposed to 'shakers' being

Conclusions sustain a greater degree a physical damage due to being hooked than chinook. Obviously, this implies a higher hooking mortality rate for coho" (p. 51). This is attributed generally to differences in behavior when hooked: coho fight much more vigorously than chinook. The only to hooking mortality rates given in this report for sport-caught salmon were 0.6% for chinook and 0.5% for coho. Recovery rate of tags from sport-caught fish for coho salmon allowed researchers to conclude that "hooking mortality that all cannot be extreme". Jensen (1958) reported that, "even if it was assumed were deaths among the test fish during extended holding. Following their capture concludes that due to hooked damage, the absolute rate would be only 5%." Jensen commonly "mortality among immature chinook as a result of their being hooked a

Recommendations None provided.

Outcome Objectives met

Sector Hook & Line

SubSector Recreational

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Report # 83.1

hooking mortality in Pacific salmon.

that, voluntarily released by fishermen (p. 57). Data on position of hooking indicate hooked in as concluded by 1 author: "there seems to be a tendency for chinook to be the deals or I slightly more often coho" (p. 58).

The used sport gear and released a game appears to be lower than anticipated." impact of hooking and releasing sport-caught salmon should not, however be dismissed as "negligible" (p. 61).

Report #	83.2
ReportTitle	A review of the subject of hooking mortalities in Pacific salmon
ProjectTitle	NA
Author	Sam Wright
ReportDate	1970
ProjectYear	2
Proponents	Sam Wright
State	Various
Objectives manage and if scientific of subject of	Objectives. "If chinook and coho resources are to be intelligently attempts to develop proper regulatory tools through excepted methods of analysis are to be successful, the true rates of hooking mortality for given set conditions must be pinpointed within relatively narrow confidence limits." The objective of this paper is to present and evaluate available data on the
Gear	Commercial troll gear.

Results See Conclusions

Conclusions For troll-caught fish, Van Hying (1968) concluded that "and estimated mortality of 40% does not appear unreasonable" for chinook. Jensen (1969) felt that his data showed coho have a considerably higher hooking mortality than chinook and a loss greater than 60% for coho was indicated. Four separate views on the subject of troll fishery hooking mortality gives a minimum loss of 40% for chinook. The author of the present paper concludes that, "in general, numbers below the 15% level must be considered as definitely minimal since they account primarily for immediately observable losses and lacked any adjustment for delayed mortalities.... it would be virtually impossible to justify use of troll-hooking mortality rate less than 10%" (p. 62). "The first 16 of 17 hooking mortality estimates for chinook and coho about 15% form the backbone of experimental research on the subject" (p. 63). While about evidence coho somewhat substantiate or refute due to lack of adequate control group experiments for chinook. Within the 15%-45% range, it is difficult to assigned an narrow were zone of "probable hooking mortality" much less appoint value or average. As a rule, however, estimates about 30% are probably somewhat excessive. Other factors possibly affecting loss commercial damage proper trollers can mentioned for the sport fishery are also of importance in considering troll-caught salmon. Involuntary losses, sub-lethal effects, and handling may all be a tremendous importance of adequate data do not exist for their evaluation (p. 63). Observations by the author indicate that experienced

without recognize sub-legal fish more than 1-2 inches below a minimum-size limit
even lifting them from the water. This allows the release with a minimum of handling, as producing a situation never achieved during experimental work. Further, losses might be maximized by setting of size limit at the mode of a population's length distribution and minimized by setting up between modes

(p. 64).

Recommendations None provided.

Outcome Objectives met

Sector Hook & Line

SubSector Commercial troll

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Report # 83.2

hooking mortality in Pacific salmon.

the
regulations
special
62).

For pink salmon, one large-scale study cited "provides sound evidence that mortality rate for this species (pink salmon) is not excessive and the requiring the release of troll-caught pink salmon are justifiable in certain cases." That study estimated mortality of troll-caught pink salmon at 13% (p.

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Report #	84
ReportTitle progress	Development of a free floating, drifting trapnet: selective salmon harvest
ProjectTitle	NA
Author	Kanji Tsumura, Theresa Godin
ReportDate	March 2000
ProjectYear	1999
Proponents	Kanji Tsumura, Theresa Godin and Bruce Ward
State	BC
Objectives commercially and quickly viable harvesting standards harvesting using capturing Live- During	<p>Objectives. Floating trapnets have been used throughout the world harvest fish species including salmon. In most cases, Nets are large requiring several boats for handling in operation and all floating trapnet described in the literature are stationary requiring heavyweights and anchors to keep the net leads in fishing position. Stationary floating trapnets are site-specific and not mobile, unlike commercial gillnetters. In the future, conservation concerns will require all fish harvesters to adopt selective harvesting methods. Fisheries managers will slash may require gillnet fissures to be able to harvest salmon species with near-zero mortality rates. To continue to participate and remain component in the commercial fishery, gillnetters may require alternative gear. A gillnet, modified or otherwise, may not needs specified selectivity and may incur unacceptable mortality rates of bycatch. The selective device designed as an alternative to gillnets should be mobile and operable one or two conventional gillnet vessels. The device should be effective in salmon alive and should emulate or exceed expected gillnet capture rates. capture will enable all species to be sorted and bycatch released unharmed. times and in areas requiring implementation of strict selective salmon</p>

harvesting
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objective
Gear
report
more easily.
size of
depth;
netting
to
trap box
from
The
the
under the
fishing
was 150
enlarged
trapnet had
opening of
line at
attached to
be
In the

techniques for gillnet fissures, a portable, free-floating, drifting trapnet may
alternative to gillnets. No such design has been found in the literature. The
Selective fishing gear and methods. The trapnet was further modified (see
#11 for description of earlier gear) to allow fish to enter the trap and box
Modifications tested included installation of a second heart to increase the
the preliminary capture area; increase the area of the apron; increase fishing
alterations to funnel size; increase in depth in length of wing leads; and
material change. Deployment and operation of the modified trapnet required
vessels and a times three depending on the motive testing. Similar to trapnets
tested in 1998, the framework incorporated aluminum pipes to prevent the
and heart from collapsing. The trap box and wings were constructed mainly
black knotless webbing. The trap box kept its original depth of 80 meshes.
design Inc. and apron or ramp to direct deep-swimming fish upwards toward
funnel entrants of the trap box instead of permitting them to swim freely
net. The apron extended 300 meshes from the inner heart and a maximum
depth of six fathoms at the distal center. At its far outside edges, the apron
meshes and had a fishing depth of four fathoms. The funnel opening was
to 30 inches by 52 inches (initially 8 inches by 40 inches). The modified
two hearts: the inner heart (closest to the trap box) varied in width from an
4-6 feet. The opening of the outer-most part was 22 feet. Total span of afloat
the mouth of the heart was 100 feet. A purse line threaded through rings
the lead line at the perimeter of the apron enabled the mouth of the trapnet to
closed off. The purpose of the purse line was to determine if catches could be
improved its sets were pursed. During ongoing modifications black netting
components of the trap were replaced with 6-8mm monofilament herring web.
latest design modifications for the autumn testing. The funnel as well as the

front of
ones
new
heart

the heart was made of monofilament herring web. Trap box frames similar to used in previous trials kept the net in fishing position during operation. In the trials, a second to "I" frame extended from the trap box to maintain the outer

Results
catch fish
indicated

Results. Trials in shallow water (0.6-3.5 fathoms) were the first sets to consistently. Even though fish were caught in low numbers, these results

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Report #

84

report September 1999-March 2000

and
sufficiently

of the research reported in this document is to continue design, development testing of a free-floating, drifting trapnet that is commercially viable and selective for the BC commercial salmon fishery.

Conclusions None provided

Recommendations Recommendations. Water flow through the trap box and trapping area compared to the surrounding environment will be examined in the next design.

Outcome Needs further study

Sector Alternate

fathoms entrants in open position. The main lead was 150 meshes deep for 15

SubSector Fish trap

lead was 50 fathoms long constructed from 3 inch black knotless webbing.

The lead

the

was removable and could be attached that either of the wing positions or at

fish. After that the trapnet might be developed to be a feasible mechanism to capture
tested these trials, the net was made to fish 50 meshes deeper than previously and
net in deeper water (6-10 fathoms). With the lead in the center position, the trap

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position, 3
 With the
 was
 form with
 suggest that
 only
 increase
 noticeably when the black netting at the entrance to the heart and funnel were

th
 possibly blocking the entrance to the heart. With the lead in the center
 vessels were at times required to maintain the trapnet in fishing position.
 main lead attached to 1 the wing positions, setting in retrieving the trap net
 simplified. Only to vessels were required to maintain the trap net in fishing
 the wing lead configuration. Fish catches were more consistent with this
 configuration than with the main lead in the center. Test sets that might
 there is no difference in catch rates relative to daytime sets. The gear was
 tested on one night so further testing is required. Fish catches started to
 increase noticeably when the black netting at the entrance to the heart and funnel were

Report #	85
ReportTitle	Catch-and-release fishing as a management tool: a national sportfishing
ProjectTitle	The BC experience in catch-and-release fishing
Author	Peter Caverhill
ReportDate	September 1977
ProjectYear	2
Proponents Research	Humboldt State University (Arcata, CA); California Cooperative Fishery
State	BC
Objectives	To review BC experience in catch-and-release fishing
Gear	Various
Results to other of	Results. A half-dozen hook and release mortality studies, some incidental programs, are briefly summarized. The studies "suggest a high survival rate
Conclusions	NA

Recommendations NA
Outcome Objectives met
Sector Hook & Line
SubSector Recreational

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Report # 86

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Management\Gordon Curry\Cohen - Gord Curry\2005\Fi
sheries Management>Selective Fishing\

ReportTitle fishing	Catch-and-released fishing: a decade of experience: a national sport
ProjectTitle 143-156).	Catch and release as a management strategy for steelhead in BC (pp.
Author	Robert Hooton
ReportDate	September 1987
ProjectYear	1985
Proponents Society,	Humboldt State University Fisheries Department; American Fisheries
State	BC
Objectives deal with Vancouver which	To review the use of catch-and-released as a major management tool to low productivity steelhead streams in BC. The document focuses on Island which "contains approximately 35% of the provincial total of streams sustain measurable steelhead angler effort and catch annually" (p. 145).
Gear	Catch and release; varioius types of terminal gear.
Results conventional mortalities rigorously, was lures hooks through upstream from the	Results. Among 3715 steelhead angled from a variety of streams on tackle to provide brood stock for hatchery programs, only 127 (3.4%) occurred. At Keogh river where hooking mortality was studied more similar high survivals were noted. Among 336 steelhead angled on various combinations of popular terminal gear, mortality for the combined samples 5.1%. Use of natural date produced higher mortality (5.6%) mandate artificial (3.8%). Mortality using barbed hooks was higher (7.3%) been using barbless (2.9%) regardless of whether bait or official lures were employed. Survival spawning of angled-and-released Keogh river steelhead was similar to that a steelhead they were captured a we're at the same location for 00 meters from the ocean. The number of steelhead caught immediately downstream

emigrating we're, tagged, released immediately upstream, and later trapped as a
not post-spawners was only 5.4% lower than the recovery rate for fish that were
fish that angled. This margin may have been attributable to additional handling stress
recovered and endured by the angled fish. Comparison of the degree of hooking injury with
the most mortality rates revealed, not unexpectedly, that mortality was highest among
(although sustained severe blood loss in the hook pierced or torn major blood vessel.
Despite extensive blood loss, 47% of the most seriously injured fish
were released in what appeared to be healthy condition. Recovery of fish in
severe injury groups did not differ substantially from the least injured fish

Conclusions maintaining Conclusions. 1. Catch and release is an effective mechanism for
not angling opportunity without native lady affecting stock recruitment. (Other
conclusions presented in the document may be specific to the late 1980s and
applicable today. Interested readers may refer to the source document).

Recommendations NA
Outcome Objectives met
Sector Hook & Line
SubSector Recreational

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Report # 87
ReportTitle 1997 gillnet study: job tangle net-4 strand monofilament Alaska twist --

data report

ProjectTitle	NA
Author	Brian Spilsted
ReportDate	October 27 & November 25, 1997
ProjectYear	1997
Proponents	Fred Hawkshaw
State	BC
Objectives	NS (data report only)
Gear	Gillnet-tangle net
Results	NS
Conclusions	NS
Recommendations	NS
Outcome	Objectives met
Sector	Gillnet
SubSector	Alaska twist

Report # 88

ReportTitle 1996 Area for selective troll fishery for sockeye -- presentation summary:

ProjectTitle NA

Author Dave Peacock

ReportDate February 1997

ProjectYear 1996

Proponents Fisheries and Oceans Canada

State BC

Objectives To evaluate selective troll fishery for sockeye

Gear NS

Results to the Skeena River. Anecdotal information from three trollers suggested up to 20% of

species and sockeye. catch lost using barbless hooks. Catch reflects general abundance of areas trolled coupled with more aggressive pinks taking red gear over Concurrent net fisheries may have affected catch although difficult to specify. Dramatic decrease in catch on second day despite overall sockeye/pink ratio generally the same (approximately 10% of catch is sockeye). Some trollers feel that of sockeye schooled up that they would have had better success. Also suggested

Conclusions sockeye negate Overall abundance of pinks versus ability to maximize harvest on viability given current net strategies to open Area 4 for further trolled fishing

Recommendations 1997 and Incorporate information learned an applied to future test fisheries in

Outcome Objectives met

Sector Hook & Line

SubSector Commercial troll

Report # 89

ReportTitle Experimental assessment of weedline-modified gillnets in statistical area 4

ProjectTitle NA

Author V. A. Lewynsky (Western Renewable Resources)

ReportDate April 1992

ProjectYear 1991

Proponents DFO; MELP

State BC

Objectives sockeye and
area (40
secondary
pink
Objectives. To further test a weedline-modified gillnet on steelhead, pink catch in marine and river areas of the Skeena gillnet fishery. The primary objective was to test 3 experimental net configurations in the marine fishing area (40 cm, 80 cm and 120 cm weedlines) and a single net configurations (120 cm weedline) in the Skeena River fishing area under controlled conditions. A secondary objective was to examine the vertical distribution of steelhead, sockeye and pink

Gear Weedline-modified gillnets

Results NS

Conclusions NS

Recommendations NS

Outcome Objectives met

Sector Gillnet

SubSector Weed line

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Report # 90
ReportTitle Survey of steelhead trout harvest to a commercial salmon fisheries of the
Bella
ProjectTitle NA
Author V. A. Lewynsky (Western Renewable Resources)
ReportDate May 1987

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Management\Gordon Curry\Cohen - Gord Curry\2005\Fi
sheries Management>Selective Fishing\

ProjectYear	1986
Proponents	DFO; MELP
State	BC
Objectives harvest by objectives of steelhead DFO portion	Objectives. To design and conduct a survey to estimate steelhead commercial gillnet and seine fisheries in Area 8 during 1986. Specific this project were: to determine the location, timing and magnitude of catch by gillnet and seine fisheries from a combination of on-site surveys and catch and effort records and to obtain biological samples from a significant
Gear	Standard commercial gillnet and seine gear
Results estimated slip	Results. For a total 5470 gillnet and 2658 seine boat-days of fishing, an 12,289 steelhead were captured in Area 8 in 1986. Based on adjusted sales records, an estimated 656 and 928 steelhead were captured in Areas 7 and 9
Conclusions than estimated river low. Hugh by the harvest of three to be Dean	Conclusions. Catch estimated by DFO hail catches was much lower by the survey sampling method employed for this research. It is reasonable to assume that all steelhead captured in the inside area were from Dean or Bella Coola stocks; the data indicate the large majority of harvest was likely Dean stock. The run size and harvest of Bella Coola/Atnarko stocks appears to be low. The author believes the estimated harvest of steelhead from the Fisher-Fitz region fairly reflects the harvest of Dean and Bella Coola/Atnarko river stocks gillnet and seine fisheries in outside waters. The estimated "incidental" 12,289 steelhead by the commercial fisheries of Area 8 was approximately three times the number of steelhead killed and/or released (4767) and 35 times the number harvested (353) by the Dean river sport fishery. There do not appear periods of low chum salmon abundance during periods of high steelhead abundance and commercial fishing could be restricted. It appears that the

much river steelhead trout migration is much stronger in early July and extends
much further into the season and previously believed. With both chum and pink
salmon

Recommendations NS

Outcome Objectives met

Sector Gillnet

SubSector

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Report # 91

ReportTitle Monofilament gillnet study in Skeena River 1990

ProjectTitle NA

Author NS

ReportDate NS

ProjectYear 1990

Proponents NS (DFO?)

State BC

Objectives a method To test monofilament net against currently used multistrand nylon net as of increasing the catch of target species relative to non-target species.

Gear vessel had a net 3/4 the For gillnet vessels were used: to the river; to outside the river. Each with two panels: 1 monofilament; 1 multistrand. Two sizes of net were used: 4 and 5 inches for each net type. A fifth vessel used nets of different depths in the

Results multistrand net in particularly increased species the The experiment showed no difference between monofilament and multistrand net in size of catch by species inside or outside. For chinook and coho it was clear that both nets function as tangle nets. Numbers of fish and CPUE with monofilament net in many cases (except pink) the ratios of target species the

Conclusions option to Results presented here artist urging in terms of using monofilament as increase selectivity of gillnet fisheries in the Skeena River

Recommendations NS

Outcome Objectives met

Sector Gillnet

SubSector Monofilament web

Report # 92

ReportTitle Incidental catches of steelhead trout in the commercial salmon fisheries of the

ProjectTitle NA

Author E. Oguss and T. R. Andrews

ReportDate May 1905

ProjectYear 1976

Proponents Marine Resources Branch, Department of Recreation and Conservation, Province of

State BC

Objectives requiring To determine the effect of modifications in net regulations such as weedlines, sunken nets or shall or nets.

Gear NS

Results likely to be Steelhead at the mouths of the Fraser and Skeena River's appear most swimming caught in the top of the gillnet but upstream in the Fraser they seem to be more deeply. In the Strait of Juan de Fuca there is no distinct pattern.

Conclusions We conclude that there is no significant influence of mesh size on
steelhead catch
(page and regulations restricting mesh sizes would not reduce the steelhead catch

Recommendations If most of the steelhead caught in the top of the net are in fact
getting tangled in the
nets cork line or first few mesh is been requiring the use of weedlines or sunken
present may be a possible management option for reducing steelhead catch. The
what data are not adequate to determine if such regulations would be justified or

Outcome Needs further study

Sector Gillnet

SubSector Weed line

Report #	93
ReportTitle the Dean and	Horizontal and vertical movements of returning adult steelhead trout in
ProjectTitle	NA
Author	Thomas P. Quinn and Gregory T. Ruggerone
ReportDate	October 1988
ProjectYear	1988
Proponents	Fisheries Research Institute, University of Washington
State	BC
Objectives Fisher and responses to diel cycle. steelhead	To described the vertical distribution of steelhead migrating through Dean Channels using ultrasonic telemetry and to describe steelhead salinity and temperature stratification and movements associated with the The secondary purpose was to describe the horizontal movements of
Gear anesthetized fish was the	Steelhead were captured and tract from a commercial purse seine vessel. Steelhead captured in the same net or get-netted a freely swimming, and a cylindrical ultrasonic transmitter was inserted into the stomach. The then measured, tagged and transferred to a recovery tank. After 15 minutes steelhead was transferred to a ventilated fish holding tube for an additional 30
Results of 224 slammed purposes was from 1.4-	Results. Each of the six steelhead was tracked for 21.0-49.8 hours, a total hours. Three of the fish slammed generally toward Dean River and three generally in the opposite direction. Use of the shoreline for migration not consistent among the six steelhead. Total movement of the fish ranged

either 2.5 kilometers per hour (mean = 2.0). Although each fish generally moot
approaching toward or away from the Dean River, they often changed direction after
Dean shallow water or indeed water near mid-channel. Steelhead returning to the
River may therefore re-enter a fishing area after swimming into a closed area.
steelhead Vertically, steelhead spent considerable time at the surface. Five of six

Conclusions sensing Conclusions. Although only six steelhead were tagged with depth-
per transmitters, the consistency of the results suggests that steelhead strongly
surface further top 1 meter of the water column in Fisher and Dean Channels. The
at preference by steelhead suggests that the lowering of commercial gillnets to
steelhead least 1 meter below the surface could substantially reduce the number of

Recommendations vertical distribution Recommendations. Additional studies are needed to identify the
Channels. of salmon, especially pink and chum salmon, in the Dean and Fisher

Outcome Objectives met

Sector Gillnet

SubSector Weed line

Report #	94
ReportTitle harvest in Dean	Evaluation of modified commercial gillnet to reduce steelhead trout
ProjectTitle	NA
Author	NS
ReportDate	February 1990
ProjectYear	1989
Proponents	DFO
State	BC
Objectives between the examine gillnet. This	Objectives. To field test a modified commercial gillnet with a 1.2 m drop surface cork wine and the gillnet webbing. The secondary objective was to examine the vertical distribution of steelhead and salmon captured in a standard gillnet. This study is the first attempt to examine the effectiveness and suitability of such a modified commercial gillnet to reduce incidental steelhead catch.
Gear currently in wine. which average readily long	Selective fishing gear and methods. The modified net a similar to those use with the exception of the webbing was hung 1.2 meters from the cork wine. Identical webbing was secured directly to the cork wine on a second gillnet served as the control. The webbing used had a mesh size of 5 7/8 in., the size in use in Dean and Labouchere channel, and Dean River steelhead are captured by this mesh size. Each net was 60 meshes deep and 200 fathoms long
Results recorded for shore,	Results. Reductions in steelhead catch were more than twice that chum (Table 1). Although catches deferred among fishing sites, distance to

differences in time of day, title conditions and whether conditions, the magnitude of
distributions of catch between the two net types did not change significantly. Vertical
steelhead and 5 salmon species captured in the standard gillnet are shown in
Figures 2-4. Steelhead are predominantly captured in the top section of the
net. No difficulties were encountered by gillnet fishermen in handling the modified
net. The

Conclusions	NS
Recommendations	NS
Outcome	Objectives met
Sector	Gillnet
SubSector	Weed line

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Report #	95
ReportTitle and Fisher	Horizontal and vertical movements of adults steelhead trout in the Dean

ProjectTitle	NA
Author Wilkinson	Gregory T. Ruggeroni; Thomas P. Quinn; Ian A. McGregor; Thomas D.
ReportDate volume 47, No.	October 1990 (Canadian Journal of Fisheries and Aquatic Sciences,
ProjectYear	1987
Proponents	NS
State	BC
Objectives returning encounter on hypotheses home these four	Objectives. A variety of hypotheses have been proposed to explain how adult salmonids negotiate a complex and changing environments they their migration from the ocean towards their natal streams. These include: (1) compass orientation; (2) title stream transport; (3) orientation to stream voters facilitated by vertical excursions through the halocline; and (4) olfaction-mediated rheotaxis. The objective of this study was to evaluate hypotheses regarding migration mechanisms. The purpose of the 1987
Gear the Dean	Selective fishing gear and methods. Individual steelhead trout migrating to the Dean River were followed using radio and sonic transmitters.
Results were the	Results. 33 steelhead were tagged with rear transmitters in 1987 and 19 were detected in the Dean River. Travel time from the capture/release location to the mouth of the Dean River averaged 7.3 days or 17.2 kilometers per day.
Conclusions Fisher channels	Conclusions. Net travel rates of steelhead tagged in the Dean and Fisher channels were considerably slower than steelhead migrating in the open ocean.
Recommendations	NS
Outcome	Objectives met
Sector	Gillnet

SubSector Weed line

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Report #	96
ReportTitle Summary	Skeena Fisheries Resource Technician Program: 1994 Operations
ProjectTitle	NA
Author	J. O. Thomas
ReportDate	NS
ProjectYear	1994
Proponents	NS

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sheries Management>Selective Fishing\

State	BC
Objectives catches intended to program	Objectives. To independently measured catch and associated biological components via an observer program. The overall objective was to reduce of coho and steelhead. In addition to providing title commercial fishery sample observations, the Skeena Fisheries Resource Technician Program was include activities in upstream environments. Technicians working in the
Gear steelhead over was	Selective fishing gear and methods. An observer program monitoring catches and measuring steelhead: sockeye and coho: sockeye relationships time and area. A study of sport angler effort and catch in the Skeena River was
Results and originating from 37 steelhead in	Results. Technicians working aboard gillnet vessels employing standard experimental nets, and seines, observed a catch of 83,068 salmon 2322 sets. For gillnet vessels employing standard net dimensions 102 of 162 steelhead were landed debt (63%). Experimental gillnet data observed 20 of steelhead dead upon net retrieval (54%). The vertical distribution of gillnet nets was quite even: 36% top; 41% middle; 23% bottom. 1300 angler
Conclusions	NS
Recommendations	NS
Outcome	Needs further study
Sector	Hook & Line
SubSector	Recreational

Report # 97

ReportTitle Skeena River steelhead stock assessment program: estimation of the 1994

ProjectTitle NA

Author Marc LaBelle

ReportDate Fisheries progress report No. 45 (1995)

ProjectYear 1994

Proponents MELP, DFO

State BC

Objectives Objectives. Implementation of catch and escapement monitoring program to provide information on the status of coho and steelhead stocks from the Skeena River. One of the objectives of this program was to obtain reliable estimates of steelhead catches for commercial fisheries operating in DFO statistical Area 4.

Gear interspersed Selective fishing gear and methods. 30 fishery observers were throughout the gillnet insane fleets during 1994 to monitor fishing effort, determine

catch composition and conduct bio sampling. (See also observer report #96).

Results
in
Steelhead
gillnets.
gillnets
significant
there
The
under
steelhead
versus
about
Statistical
revealed
suggests
supports the
Further
at
Area 3-4
not

Results. Statistical comparisons were made of steelhead: sockeye ratios observed catches of regular and modified gillnets during July in Area 4. always accounted for 3% of the combined steelhead-sockeye catches in gillnets. The relative abundance of steelhead tended to be slightly lower in modified gillnets which supports the notion that weedlines allow more steelhead to escape. Statistical tests of the steelhead: sockeye ratios in catches revealed no differences between net types in all possible comparisons. This indicates that there are only small differences in the selectivity of both gear types for steelhead. The relative selectivity index of modified gillnets was estimated to be 0.906. This indicates that steelhead are less susceptible to capture by modified gillnets under actual fishing conditions and modified gillnets caught about 10% fewer steelhead and regular gillnets during July in Area 4. The relative selectivity of gillnets versus seine nets was estimated to be 1.37. This indicates that gillnets intercept about 37% more steelhead than seine nets for comparable catches of sockeye. Statistical tests of the steelhead: sockeye ratios in catches of both vessel types revealed significant differences in 205 possible comparisons. Statistical analysis suggests that on average fishermen report about 60% of steelhead caught which supports the hypothesis that fishermen under report steelhead catches in this fishery. Further analysis indicated that fishermen under report proportionally fewer steelhead at higher catch levels. Total commercial harvest of Skeena River steelhead in Area 3-4 during 1994 was estimated to exceed 10,000 fish. This catch estimate does not

Conclusions	NS
Recommendations	NS
Outcome	Objectives met

Sector Gillnet
SubSector Weed line

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Report # 98
ReportTitle data 1994 Skeena watershed fisheries technician program: catch and effort data
ProjectTitle NA
Author NS
ReportDate NS
ProjectYear 1994
Proponents MELP, DFO
State BC
Objectives #96-97) To document fishing catch and effort on Skeena River stocks (see also
Gear NS
Results This report consists entirely of data tables
Conclusions NS
Recommendations NS

Outcome Objectives met
Sector Hook & Line
SubSector Recreational

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Report # 99
ReportTitle NS (DFO analysis of 1994 MELP-MAFF and 1995 DFO observer data)

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ProjectTitle	NA
Author	NS
ReportDate	NS
ProjectYear	1994
Proponents	DFO
State	BC
Objectives	Catch data
Gear	Observer program
Results	This report consists entirely of data tables and results.
Conclusions	NS
Recommendations	NS
Outcome	Objectives met
Sector	Hook & Line
SubSector	Recreational

Report # 110

ReportTitle 1999 Fraser River Modified Gillnet Study

ProjectTitle NA

Author J.O. Thomas and Associates

ReportDate March 2000

ProjectYear 1999

Proponents Paul Kandt, David Lind, Tom Sheaves

State BC

Objectives
catch species To test effectiveness of a modified gillnet to reduce the incidence of by
of (chinook, coho, and steelhead). Primary interest was in decreasing the ratio

Gear
test. The Selective Fishing Gear and Methods. 50 fathom control and 50 fathom
variables between the control and test panels were mesh size and hang ratio.

Results The results of the study were inconclusive. A statistical model detected no
5458 total difference in the proportions of chum versus any of the by catch species.
 chum were caught while 94 by catch species were caught. 10 of which were

Conclusions NS

Recommendations A larger sample of by catch may have been collected by increasing
fishing effort and by fishing earlier in the season. Starting in Early October and finishing by
early November might increase encounters with by-catch

Outcome Needs Further Study

Sector Gill Net

SubSector Mesh Size

Report # 111.1

ReportTitle 1999 Fraser River Fishermans Society Fish Wheel Report

ProjectTitle NA

Author J.O. Thomas and Associates

ReportDate April 2000

ProjectYear 1999

Proponents Barry Manuck, Fraser River Fishermans Society

State BC

Objectives allowing by- To test a fish wheels effectiveness in selectively fishing for Chum while catch to be sorted out in the process.

Gear Fish Wheel

Results Chinook In 25 days that the fish wheel was in place, 1029 Chum, 4 Coho and 3 as were were caught in the trap. 41 of the 44 Coho were released in good condition as were

Conclusions successful, The effectiveness of the fish wheel I being able to release by-catch was however more Chum needed to be caught to make it economically viable

Recommendations Other locations with higher flow rates and more turbid water might increase the numbers of chum caught. The ability of the fish to be able to recognize the wheel and avoid it was the main obstacle. Another location on the Stove, Chilliwack or Chehallis systems might afford better conditions for the operation of a fish wheel.

Outcome Needs further study

Sector Alternate
SubSector Fish Wheel

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Report # 111.2
ReportTitle 1999 Fraser River Fishermans Society Fish Trap Report
ProjectTitle NA
Author J.O. Thomas and Associates
ReportDate April 2000
ProjectYear 1999

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sheries Management>Selective Fishing\

Proponents	Barry Manuck, Fraser River Fishermans Society
State	BC
Objectives sorting by-	To test a fish traps effectiveness in fishing for Chum while selectively catch species in the process.
Gear	Fish Trap
Results caught. Steelhead	In 25 days that the fish trap was in place 436 Chum and 151 Coho were caught. 148 of the 151 Coho that were caught were released in good condition. 1
Conclusions wheel. The dedication	The ratio of by-catch with Chum and Coho was higher than the fish success of the trap in releasing by-catch is a direct result of the crews and sorting abilities/ techniques, since it is all done by hand.
Recommendations efficiency. The trap could be	A more suitable location of the fish trap may increase its fishing may also be modified to make it more efficient. A new entrance to the trap designed to make it less of a deterrent to enter the trap.
Outcome	Needs further study
Sector	Alternate
SubSector	Fish Trap

Report # 112.1

ReportTitle Selective Fish Harvest Devices for use on the Skeena River

ProjectTitle NA

Author Wilfred H. Mckenzie

ReportDate November 1999

ProjectYear 1999

Proponents Wilfred H. Mckenzie, Kitselas Band Council

State BC

Objectives
band A selective fishing method to harvest food, social and ceremonial for
Skeena membership, and to allow the release of non target by-catch, mainly upper
Coho. A DNA sampling program will also occur as fish are handled.

Gear Fish Trap

Results
21 Trout 9 Sockeye, 30 Jk Sockeye, 2 Coho, 130 Pinks, 2 Chum, 1 Steelhead and

Conclusions The effectiveness of this fish trap experiment was not demonstrated due to the lack of time it was used to fish. The condition of the trap was poor since it was reported as "under repair" for most of the experiment. There was not enough data to be statistically valuable, therefore no conclusions on the traps effectiveness could be

Recommendations To have the equipment in good running order and the means to repair it rapidly

Outcome Needs further study

Sector Alternate

SubSector Fish Trap

Report #	112.2
ReportTitle	Selective Fish Harvest Devices for use on the Skeena River
ProjectTitle	NA
Author	Wilfred H. Mckenzie
ReportDate	November 1999
ProjectYear	1999
Proponents	Wilfred H. Mckenzie, Kitselas Band Council
State	BC
Objectives band Skeena as a	A selective fishing method to harvest food, social and ceremonial for membership, and to allow the release of non target by-catch, mainly upper Coho. A DNA sampling program will also occur as fish are handled as well
Gear	Fish Wheel
Results Chinook, 92	986 Sockeye, 2548 Jk Sockeye, 289 Coho, 3878 Pinks, 61 Chum, 9 Steelhead and 130 Trout.
Conclusions target	The Fish Wheel demonstrated that it could catch fairly good numbers of species like Sockeye and Pink salmon however, the degree of success of this project lays in the ability to release non target by-catch with high survival.
There was	very little data to indicate any kind of survival of the by-catch fish.
Recommendations the condition at method.	Recording the data of all by-catch caught and release, as well as release would better evaluate this methods efficiency as a selective fishing method.
Outcome	Needs further study

Sector Alternate

SubSector Fish Wheel

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Report # 113
ReportTitle Modified Revival Box Program Upper Skeena Coho
ProjectTitle NA
Author Gerry O'Conner, Prince Rupert Community Development Centre
ReportDate 2000
ProjectYear 2000

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sheries Management>Selective Fishing\

Proponents Joe McAllister, 20 unnamed fishing vessels.

State BC

Objectives To test the modified revival box on upper Skeena Coho to determine a survival rate of gillnet caught Coho under normal fishing conditions.

Gear NA

Results WEEK 1 : SK 21583, CO 147, PK 3927, CM 295, CK 14, STHD 393
WEEK 2 : SK 25899, CO 221, PK 15393, CM 214, CK 76, STHD 882 Coho Survival in the first week was 58% and 44% in the second week of fishing.

Conclusions The results were broken down into 2 separate weeks because in the second week, a selective seine opening was occurring in the area which may have altered the results. With 25% of the participants achieving 70% survival or better, there is confidence that this rate could be achieved in other similar fisheries using gillnets

Recommendations A further study next season during the regular commercial fishery with 20 boats and observers using the modified revival box would be reliable if there is no other selective fishery in the area. The revival boxes would be best if same materials

Outcome Objectives Met

Sector Gillnet

SubSector NA

Report # 115

ReportTitle Skeena Wild Drifting Salmon Trap

ProjectTitle NA

Author Fred Hawkshaw

ReportDate January 4, 2001

ProjectYear 2000

Proponents Fred Hawkshaw

State BC

Objectives To demonstrate that a free drifting fish trap can be implemented as a viable way to harvest salmon and sort out by-catch in the process.

Gear Free Drifting Trap. Two 90'L x 30'D wings with 100' of belly web with a pursing line. aluminum 80' long ramped to a cod end 10' x 10' x 17' held together by a rectangular

Results 8 days of fishing yielded 84 Sockeye, 6 Coho, 73 Pinks and 4 Steelhead.

All Steelhead and Coho were released alive.

Conclusions There was a large run of Sockeye present however the trap did not catch a significant number of that run. This did not prove to be an economically viable

Recommendations Modifications in the design of the fish trap that would prevent "spooking" the fish before entering the trap may be looked at in the future.

Outcome Needs Further Study

Sector Alternate

SubSector Fish Trap

Report #	116
ReportTitle Harvest	Development of a Free Floating, Drifting Trap Net. Selective Salmon
ProjectTitle	NA
Author	Kanji Tsumura, Theresa I. Godin
ReportDate	December 2000
ProjectYear	2000
Proponents	Kanji Tsumura
State	BC
Objectives decrease the after	To design and test an entranceway into the trap box that would number of Sockeye salmon avoiding capture by turning and swimming away
Gear mesh)	Trap Net: 49' long x 30' wide at the entrance x 100 meshes deep (3"
Results	16 sets yielded 155 Sockeye, 18 Pinks and 3 Coho.
Conclusions equipment, reletively be	Higher catches of Sockeye in 2000' than in previous years using similar can be attributed to dimensional changes of the trap itself. Unfortunately low catch numbers were recorded. A larger catch of target species needs to be
Recommendations netting, on some salmon width	Replacing monofilament netting and black nylon with multifilament of the components of the trap, would make it less visable to approaching and less bulky to handle. Other recommendations included increasing the
Outcome	Needs Further Study

Sector Alternate
SubSector Fish Trap

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Report # 117
ReportTitle Floating Trap Net Scientific License Number : 00.184 (July 28 - Oct. 31,
2000)
ProjectTitle NA
Author Larry Sharp

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sheries Management>Selective Fishing\

ReportDate	December 16, 2000
ProjectYear	2000
Proponents	Gerry Diakow, Wilfred Wilson and Colin Smith
State	BC
Objectives target process, it	To build and test a selective salmon trap capable of harvesting surplus salmon stocks in commercially viable quantities. During this harvesting is also the focus of the project to try and achieve as close to zero mortality as
Gear fathoms seine	Trap Net consists of "inside salmon seine netting". The outer lead was 50 of 4 3/4" border seine web. There was 8 lbs per fathom leadline with 5/8"
Results and 1 included	Species caught during the study were 33 Sockeye, 109 Coho, 45 Chum Steelhead. All Coho and Steelhead were released. Other species caught Dolly Varden, Sturgeon, Carp, Chub, Squawfish, Shad, Flounder and Sculpin.
Conclusions tagging or of the site	A stationary fish trap represents an ideal platform for test fishing and recapturing many fish species with little to no fishing induced mortality. Much success of such a trap depends on timing of the run of salmon, location of and the weather conditions that may be encountered.
Recommendations this years trap, and fishing with catch	Additional modifications and innovations evolving from testing of previous ones, would benefit the project in the future. Also, timing the the peak of a target species run would increase the chances of getting more
Outcome	Needs Further Study
Sector	Alternate
SubSector	Fish Trap

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Report #	118
ReportTitle Coast	Preliminary Study on the use of the Selective Salmon Trap Net North
ProjectTitle	NA
Author	Ken Kristmanson
ReportDate	October 2000
ProjectYear	2000
Proponents	Ken Kristmanson
State	BC
Objectives Chum while	To selectively harvest species of salmon such as Sockeye, Pink and

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Coho,	simultaneously releasing and/or tagging more endangered species such as
Gear aluminum	194 meters long of 50% knotless web x 2 1/2 strips deep. 8' x 8' x 10' trap covered with 3" knotless web.
Results Pinks, 90 Steelhead	Species caught during the study were 4719 Sockeye, 117 Coho, 4890 Chum, 12 Chinook, and 140 Steelhead. All Coho, Chum, Chinook and
Conclusions satisfaction. in	The participants in this study feel that this method was working to their The changes that were made in the design of the net have proven successful catching substantial numbers of targeted salmon.
Recommendations	NA
Outcome	Objectives Met
Sector	Alternate
SubSector	Fish Trap

Report # 122

ReportTitle Refinement of Mesh and Twine Size for a Small Mesh Tooth Net and Catch

ProjectTitle NA

Author William Mark Petrunia, Mark Fetterly, Christina Petrunia

ReportDate NA

ProjectYear 2000

Proponents Mark Petrunia

State BC

Objectives The purpose of this selective fishery was to complete the refinement of the mesh and twine sizes of a small mesh tooth tangle net, as well to conduct a catch efficiency and a mortality study of by-catch of the selected tooth tangle nets against

Gear One net consisted of four panels of different mesh size, the other consisted of four panels of different twine thickness. The Panels testing mesh size had 2 3/8", 2 3/4", 2 1/8", and 3 1/2" mesh. Each panel was 25 fathoms in length made of #19 multi stranded nylon net with a hang ratio of 3:1. Each net was of equal depth as the 3 1/2" 90 mesh. The multi panel twine thickness net consisted of #16, #19, #23, and

Results The results of the first objective were that the 3 1/2" mesh caught the

highest percentage of target Sockeye at 38.3%. The testing of the twine size showed that the #16 twine caught 34.4% and the #19 caught 28.4%. The next test was to compare the mesh and twine sizes that had the best results to the industry standard which is a 5 1/4" #19 net, during a 10 day study. The results of the #19 and the #16 twine were combined since they were close in catch percentage. The 3 1/2" #16/#19 mesh caught 23.8% of the Sockeye, 46.7% of the Chinook and 67.6% of the Coho. For each species the 5 1/4" conventional net caught the remaining percentage. The Coho mortality with the test net was 21.7% and the traditional net had a mortality rate of 9.1% in Coho. Chinook had a mortality rate of 16.1% with the test net and 29.3% with the conventional net. In the third objective, the 3 1/2" #19 net was compared to the conventional 7" #23 Chum net. The tooth net caught 1.27 Chum for each Coho caught. The 7" net caught 17.9 Chum for every Coho caught. The tooth net caught 13.3 Chum for every Coho mortality and the 7" net caught 18.8 Chum for every Coho mortality. 382 Coho had DNA taken with a hole punch from their tails. All juvenile

Conclusions Sockeye and Chum. The 3 1/2" #19 was the most optimal net of the tooth nets tested on Sockeye and Chum. However when compared to a traditional net, the results were that the traditional gear was much more efficient in catching fish. The tooth net also had higher mortality rates on Coho and Chinook. The tooth net, when compared to conventional nets in the Chum fishery, was less efficient and seemed to target the

Recommendations It was recommended that the set times be shorter to reduce the by-catch mortality. It is possible that larger nets on late run Sockeye fisheries may show lower by-catch of Coho to Sockeye catch. As for the Chum fishery, further testing on possible drop traditional size Chum nets and testing of larger than the 7" mesh would more than

Outcome Objectives met

Sector Gillnet

SubSector Tooth net

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Report # 123

ReportTitle Canoe Pass Selective Paddle Trap in the Lower Fraser Mainstem

ProjectTitle NA

Author Brent Mowat or JamesDobrilla?

ReportDate January 18, 2001

ProjectYear 2000

Proponents Bob Pearson, Brent Mowat

State BC

Objectives target fish To utilize the paddle trap in a fishery that would be efficient in catching with minimal adverse effects on non target fish and the surrounding ecosystem in

Gear web is 3" 2 leader lines that extend 50 fathoms out from the trap or platform. The knotted seine webbing 150 meshes deep with 10 lbs/fathom leadline attached.

Results Chinook and In 25 days of fishing, the trap caught 3 Sockeye, 13 Chum, 35 Coho, 4

Conclusions
commercially
was
not very
and not a
peak of
more.

The proponents of this experiment felt that the paddle trap will be a viable means to harvest salmon in unique conditions. A low mortality rate attained in by-catch which was the main focus of the study. Unfortunately many target fish were capture by the trap which is felt to be other variables direct result of the equipment itself. The crew felt that they had missed the the Sockeye run and that if the fish were there, they would have cught much more.

Recommendations
be
full and
paddle trap

Earlier starting times in order to fish the trap during peak runs would be advantageous in the testing of this trap. It was mentioned that to ensure a continuous testing o the trap, a clear mandate from DFO concerning the operation to other sectors would make the project go smoother without any

Outcome

Needs Further Study

Sector

Alternate

SubSector

Paddle Trap

Report # 124

ReportTitle Design and Testing of the Gisgagaas Canyon Fish Wheels and the Design of New

ProjectTitle NA

Author Jon Mikkelsen and Charles Muldon

ReportDate January 2001

ProjectYear 2000

Proponents Gitksan Watershed Authority

State BC

Objectives determine a floating To test the efficiency of a high water and a low water fish wheel and to how the wheels stand up to the wear and tear of the river. A new basket for a floating fish wheel will also be tested to see if there is an efficiency increase from the

Gear frame. extreme river in. Its The high water level wheel is the most rugged of all the traps. Aluminum frame. The low water level wheel is lighter duty in its design and not made for conditions. The floating wheel is made of pontoons with a holding tank built in. Its

Results 148, Coho 5, fishing. fishing. High Water Wheel : 32 days fishing. Sockeye 13,274, Sockeye Jacks 144, Chinook 2, Steelhead 2, Chum 3. Low Water Wheel : 3 days Sockeye 205, Jacks 18, Coho 1, Pinks 22. Floating Wheel : 15 days

Conclusions Both the high and low water fish wheels were considered very successful. High water levels led to the low water wheel only being fished for three days, but it was still efficient. The floating wheel also proved efficient and along with the high water

Recommendations Some modifications to the low water wheel would be an improvement in the future. Baskets resembling the floating traps baskets would surely improve on the current efficiency. Also a reduction in the flexing of the frame and axle is necessary in the future. Results show that higher catches occur at night, also with less encounters with by-catch species. Future studies on turbidity and water levels compared to

Outcome Objectives Met

Sector Alternate

SubSector Fish Wheel

Report #	125
ReportTitle	Terminal Salmon Traps for Selective Fish Harvest - 2000
ProjectTitle	NA
Author	Don Sinclair R.P. Bio.
ReportDate	NA
ProjectYear	2000
Proponents	Campbell River Indian Band
State	BC
Objectives assessing	To operate a non retention selective test fishery for the sole purpose of post handling survivals and trap effectiveness.
Gear	2 fish traps. 1 designed for use in slightly deeper water
Results	Both traps caught a combined total of 4 Chum and 24 Pinks.
Conclusions with the	Low abundance of salmon in the area was the primary problem along possible poor location of the traps in the bay.
Recommendations outside the bay, this	If both traps were located at the entrance to the bay or even just may increase the chances of intercepting fish migrating to that area.
Outcome	Needs Further Study
Sector	Alternate
SubSector	Fish Wheel

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Report #	126
ReportTitle	In Water Sorting for Selective Seine Harvest-2000
ProjectTitle	NA
Author	Don Sinclair R.P. Bio.
ReportDate	NA
ProjectYear	2000
Proponents	Campbell River Indian Band
State	BC

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Objectives in the by- use in	To test the concept of in water sorting systems to achieve zero mortality catch and to evaluate the procedures and overall performance for possible
Gear seine set and sorting boat itself	Two different sorting devices. 1st) a cage system that goes inside the is a working platform for two people. Inside the cage is the two aluminum troughs. 2nd) A converted skiff that has the troughs welded inside it. The acts as a working platform and gets lowered inside the seine set.
Results Coho. 2nd set second set	1st set using the cage sorter : 2797 Sockeye, 457 Pinks, 5 Chum, 3 using the cage sorter : 255 Sockeye, 124 Pinks, 5 Coho. Sort rate of the was 9.6 fish/min. 3rd set using the converted skiff : 35 Chum. Sort rate of 14
Conclusions of the project could be	Testing efforts were very limited during this project, but the proponents still feel that in water sorting can achieve zero mortality on non target species. Further testing may determine whether or not this type of selective process
Recommendations improve the end and high prevent	Streamlining various components of the sorting process would result. Additional testing in various seas conditions, including rough seas current would be important in the future. Narrowing the troughs width would
Outcome	Needs Further Study
Sector	Alternate
SubSector	In water sorting devices

Report # 129

ReportTitle Selective Harvest Program of the Sumas First Nation- 2000.
Development of a

ProjectTitle NA`

Author Jon Mikkelsen and Murray Ned

ReportDate February 2001

ProjectYear 2000

Proponents Sumas First Nation

State BC

Objectives To test the design of a power assisted fish wheel that would be
implemented in times of lower flow, and to test the design of a bubble lead that would replace
netting with a curtain of bubbles produced by an air compressor.

Gear Canyon style fish wheel. 1 hp electric motor. 90 psi commercial diesel air
compressor. Bubble lead was made of 1" polyethylene pipe with 0.012" holes

Results A 1.5 hp single phase AC motor was selected to power the fish wheel. It
is a "washdown" model with a torque limiter to prevent the motor from burning out

when a piece of debris jams the wheel. There was no in river testing of the bubble
lead, it was postponed until 2001. Some in tank testing of the bubble lead was
conducted. A 10 foot section of pipe was put in a tank of water and the bubble patterns
were examined as the air was put to the hose. The 0.012" holes allowed an even
distribution of bubbles with 0.5 cfm/ ft of pipe, however when the hose was

Conclusions in field The motor seemed to power the wheel without any problems but further
testing will be more conclusive.

Recommendations the effectiveness A full season of testing would be the best approach to determining

Outcome Needs Further Study

Sector Alternate

SubSector Fish Wheel

Report # 131.1

ReportTitle Selective Fish Harvest Devices for use on the Lower Skeena River

ProjectTitle NA

Author Wilfred H Mckenzie and Fredrick C. Mckenzie

ReportDate November 2000

ProjectYear 2000

Proponents Kitselas Band Council

State BC

Objectives
develop new
steer fish
DNA To reduce by-catch mortalities by live releasing using a fish trap. To harvesting techniques, gear and methods along with testing new leads to into the trap. Conduct short term survivability testing on Coho as well as

Gear
2.7m x
11/4". The
perimeter. Revised leads: Square funnel 10.1m x 6.8m down to an entrance size of 2.6m. The frame of the square is made from aluminum pipe measuring 1 1/4". The funnel is covered in a 2" seine mesh and floated with corks around the perimeter. The trap was raisable by a winch and floated on two pontoons.

Results
Coho and 49 In 39 days of fishing the trap caught 35 Sockeye, 44 Jack Sockeye, 1 Pink. No survivability testing was done with these results.

Conclusions
experiment, Due to fluctuating water levels destroying the fish leads early on in the the results were inconclusive of the original objectives.

Recommendations The band has decided to abandon the use of a fish trap in the canyon due to fluctuating water levels making it difficult to install and operate.

Outcome Needs Further Study
Sector Alternate
SubSector Fish Trap

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Report # 131.2
ReportTitle Selective Fish Harvest Devices for use on the Lower Skeena River
ProjectTitle NA
Author Wilfred H Mckenzie and Fredrick C. Mckenzie
ReportDate November 2000

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sheries Management>Selective Fishing\

ProjectYear	2000
Proponents	Kitselas Band Council
State	BC
Objectives develop new steer fish DNA	To reduce by-catch mortalities by live releasing using a fish trap. To harvesting techniques, gear and methods along with testing new leads to into the trap. Conduct short term survivability testing on Coho as well as
Gear to a have 2	The fish wheel is constructed of aluminum framing with 3 baskets attached to a folding axle suspended between 2 twelve meter pontoons. The scoops are approximatley 3 meters in width and 3 meters in depth. The pontoons also
Results 2019, Chum that	57 days of fishing : Sockeye 8960, Jack Sockeye 382, Coho 134, Pinks 53, Chinook 19 and Steelhead 165. Survivability testing showed that all fish were held overnight, all were released in the morning lively with no scale loss.
Conclusions of selectively mortality	The testing of the fish wheel provided results showing that it is capable harvesting large amounts of returning salmon while having a near zero rate on the released by-catch held overnight.
Recommendations find the most on the	Future testing of the wheel may include testing the RPM speed to efficient speed for capturing the fish. Various minor mechanical adjustment equipment would also be made in the future.
Outcome	Objectives Met
Sector	Alternate
SubSector	Fish Wheel

Report #	133
ReportTitle	Selective Fisheries Program 2000 - Final Report
ProjectTitle	NA
Author	Western Spirit Fishing Quality Projects Inc.
ReportDate	NA
ProjectYear	2000
Proponents	Cecil Hill, Chuck Pilford and Ken Innes
State	BC
Objectives sorting during species	To compare the efficiency of in water sorting versus on board stunned a commercial seine fishery and to compare mortality rates of by-catch
Gear	In Water: Two 40' x 40' x 40' net pens, a 40' x 10' (wide) x 40' holding pen

and a sorting trough (unknown dimensions) On board: Two slush totes, a stun tank and a revival tank with water flow to it.

Results transferred to harvested. dead. All In Water: 3 days fishing harvested 3144 fish while 24 by-catch were the holding pen in vigorous not bleeding condition. On board: 4402 fish 32 coho total, 29 vigorous not bleeding, 1 lethargic not bleeding and two were released after they had recovered to the satisfaction of the crew.

Conclusions In water sorting minimizes handling and the fish can recover longer and protected. However, towing the seine to the holding pen site can be stressful on the fish and time consuming for the crew. Releasing the fish at night was a benefit due to lower chance of predation by seals and less chance of other fisheries in the area catching

Recommendations For on board sorting, recommendations center around making the equipment more permanent and efficient. No major changes. A revival tank with a gate that goes overboard would reduce the handling stress on the fish.

Outcome Objectives Met

Sector Seine

SubSector Comparison of sorting methods

Report #	128
ReportTitle Mortality and	Area H Commercial Troll Selective Fisheries Project, Post Release
ProjectTitle	NA
Author	Archipelago Marine Research Ltd.
ReportDate	NA
ProjectYear	2000
Proponents	Area H - Garry Stoner, Michael Griswold
State	BC
Objectives compare	To compare results of various post release techniques on Coho and to mortality on Coho using circle hooks as opposed to J hooks.
Gear overnight It is used the pen. beside	Various sizes of circle and J hooks. A net pen divided into 4 quadrants for recovery of the Coho after they come from the revival tank or the tow cage. to survey the Coho and record any mortalities that occur while the fish are in A revival tank with water pumped into it is used. A tow cage that is towed
Results Hook 682.	Catch Comparison of Circle Hooks to J Hooks : Coho : Circle Hook 475, J Revival Tank Mortality : Circle Hook 22.3%, J Hook 19.5%. Waterline

Release

Mortality : Circle Hook 7.1%, J Hook 8.0%.

Conclusions
locations

Circle Hooks showed a slight reduction in eye hooks and other hook normally associated with higher mortalities. The results show no significant difference in mortality between circle and J hooks, however J hooks caught

more

fish during the study. An increase in mortality of fish placed in revival tanks

is a

Recommendations
for this type of a

The proponents of the study suggest staying with standard J hooks fishery. If revival tanks are to be used, it is recommended that water flow,

density

and time in tank be all reassessed to find ideal guidelines to maximize the

fishes

Outcome

Objectives Met

Sector

Hook and Line

SubSector

Commercial Troll

Report #	132
ReportTitle Fishery	Observations from the Dixon Entrance Selective Pink Salmon Troll
ProjectTitle	NA
Author	J.O. Thomas and Associates
ReportDate	February 2000
ProjectYear	2000
Proponents	Northern Trollers Association, Unamed Observers
State	BC
Objectives Pink salmon using time of	1) To conduct an economically viable troll fishery that selectively targets while minimizing Coho by-catch. 2) To avoid areas of high Coho numbers real time catch data. 3) To observe the physical condition of the Coho at the release. 4) To collect DNA and scales from Coho
Gear on every	Barbless hooks and "red" gear to target Pinks. Revival boxes were also
Results 17.6% in There were ratios July vigorous not the	There were 36,243 Pinks harvested in the two fisheries. 82% in July and 17.6% in August. The average CPUE per day in July was 466 and 206 in August. 2,371 Coho encounters with an average CPUE of 25 per day. Coho : Pink ratios were 0.05 : 1 in July and 0.16 : 1 in August. The estimated Coho mortality in July was 13% and in August it was 11%. 88% of the Coho released were vigorous not bleeding while 12% were not expected to survive which was calculated into the
Conclusions	The results from this study show that a limited or small scale fishery can

effectively target Pink salmon while minimizing encounters and mortalities of by-catch species such as Coho. Economic viability of the fishery will have to be discussed further

Recommendations The proponents agreed that the mandate to selectively troll using techniques for Pink salmon such as use of "red" gear, 50 fathom minimum depth, barbless hooks and revival tanks is important. Data entry by observers should also include hook size and type, leader length, flasher type, hootchie configuration, trolling speed and fishing depth. Hooking locations on fish should be recorded. Using experimental

Outcome Objectives Met

Sector Hook and Line

SubSector Commercial Troll

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Report # 135

ReportTitle	T'sou-ke First Nation Salmon Trap Development Project
ProjectTitle	NA
Author	David Lightly
ReportDate	March 2000
ProjectYear	1999
Proponents First Nation	T'Sou-ke First Nations, Fraser River Fishermans Society, Tsawwassen
State	BC
Objectives T'Sou-ke First salmon.	To test a modified version of the floating salmon trap developed by the Nation on the Fraser River as a means of selectively harvesting returning
Gear	Fish Trap - 1 3/4" knotless nylon web.
Results catch was as Sturgeon 16.	The trap was in the water for 42 days and fished for 28 days. The total follows : Sockeye 45, Pink 716, Coho 48, Chinook 19, Chum 97, Mortalities during the study were Pinks 25, Coho 1, Chinook 1, Chum 15.
Conclusions releasing fish the potential the	The proponents involved felt this trap was effective at capturing and with a minimum level of apparent stress. The trap was not functioning during the period of high Sockeye abundance therefore it wasn't tested to its full potential during a strong run. Seals also played a major role in deterring salmon from the
Recommendations making the trap salmon 24	Some recommendations from the proponents of the study include more mobile, test during periods of high salmon abundance and when all species are present, and do a long term study on by-catch survival, perhaps
Outcome	Needs Further Study

Sector Alternate

SubSector Fish Trap

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Report # 140

ReportTitle Seine "Sock" Brailer Study

ProjectTitle NA

Author Glen Budden and the Fishing Vessel Owners Association

ReportDate February 1, 2000

ProjectYear 1999

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Proponents	Glen Budden
State	BC
Objectives determine	To test a sock brailler on seine vessels in a commercial fishery to efficiency, reliability, safety and fish quality improvements.
Gear conventional net of the back	The "sock" is made of a non porous material as opposed to the a brailler. The end of the sock brailler also extents to the sorting trough on
Results imrproves caught, less	General consensus of crews involved were Pros: Lowers mortality rates, fish quality, safer than conventional method. Cons: Jellyfish that get durable, slower, expensive, problems with wind, sorting is more difficult.
Conclusions more and	To be commercially viable, the sock brailler has to be redesigned to be durable. Skippers commented that every new piece of equipment takes time practice to become efficient. There were also concerns on the difficulties of
Recommendations the feelings of allows the the	Without scientific proof that a sock brailler is a superior brailler, it is the proponents involved that manditory use is out of the question. If DFO usage of a sock brailler as a condition of lisencc, some of the fleet may adopt
Outcome	Objectives Met
Sector	Seine
SubSector	Brailing

Report #	141
ReportTitle	Fraser River Coho Encounters Study 2000
ProjectTitle	NA
Author	Cascade Fishing Charters and Fraser River Fishermans Society
ReportDate	December 2000
ProjectYear	2000
Proponents	Fraser Valley Salmon Society
State	BC
Objectives Chinook and Coho	To determine if recreational anglers could selectively fish for Sockeye, Chum during a non Pink salmon year while avoiding capture of co-migrating
Gear spin-n- barbless	Bottom Bouncing: 1/0, 2/0, 3/0 single barbless hooks with wool, corkies, glos, drifters or any combination. Bar Fishing: same hook sizes but only

Results
Chinook, 22
captured
hours.
and 1%

172 anglers over 6 days at three different locations caught 12 Coho, 46 Chinook Jacks, 2 Chum and 2 Sockeye. Bottom Bouncing technique 69.4% in 1740 angling hours while Bar fishing caught 30.6% in 540 angling hours. 76% of the fish were hooked in the outer mouth, 15% in the body, 8% NA and 1%

Conclusions
salmon, 69.3%,

The majority of the fish captured in this years study were Chinook using bottom bouncing and bar fishing as the techniques.

Recommendations
effects of the
the
was

It is suggested that a similar study be conducted to determine the different angling techniques on selectively catching salmon species. Having the same number of anglers bottom bouncing and bar fishing at the same time

Outcome Needs Further Study

Sector Hook and line

SubSector Recreational

Report # 143

ReportTitle Selective Gillnet First Nations and Commercial Sector Selective Fisheries Project.

ProjectTitle NA

Author Archipelago Marine research Ltd.

ReportDate NA

ProjectYear 2000

Proponents Dave Kadyschuk

State BC

Objectives gillnet and a To compare the vertical distribution of all salmon species in a "control"

Gear was 50 fathoms long made of 6 3/8" 60 mesh chum gillnet and the test was the same only

Results Steelhead, 117 was fished 34%) The control net was fished for 71.5 hours catching 1800 Chum, 4 Coho, 14 Chinook and 2 Sturgeon. (66%) The test section of the gillnet for 63.7 hours catching 928 Chum, 3 Steelhead, 63 Coho and 5 Chinook. (The mortality on Coho was 36% and on Chinook was 37%.

Conclusions target and by- The results show that the control net caught nearly twice as many catch fish as the test net. 82% of Chum were caught at a depth greater than

10 feet.

No Steelhead were caught deeper than 20 feet. Coho were distributed fairly evenly

Recommendations
evaluate methods of

and/or

Further test fishing opportunities should be available to further reducing by-catch encounters. Comparisons between areas, time of day tides were possible things to look at in the future.

Outcome

Needs Further Study

Sector

Gillnet

SubSector

Weedline

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Report #

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ReportTitle Flexible Seine Selectivity Grids

ProjectTitle NA

Author Paul A. Brajcich

ReportDate NA

ProjectYear 2000

Proponents Paul Brajcich

State BC

Objectives
target species
flexible To allow the safe escapement of non target species while retaining using grids that are strong enough to handle the weight of large sets and enough to address drum, power block and spooling gear demands.

Gear
approximately 20" x Escaped grids of various sizes, shapes and colour. Each grid is 26". The catcher bags are made of 2" knotless web.

Results
from this total.
circle =
E.P.D.M. =
colours 4500 fish in 20 days were caught. There was no species break down
Grid results : White aluminum = 25.6%. Green aluminum = 14.6%. Clear
23.9%. Black E.P.D.M = 14.4%. Clear Oval = 6.7%. C.I.M. = 6.9%. White
1.5%. 4 1/2" circle in netting = 6.5%. Dark colours caught 42.3%. Light
caught 57.8%. Front grids caught 37.2. The middle grids caught 62.8%

Conclusions
58%
The A pattern seems to be showing over the past few years with this study.
preferred the lighter grids and 63% preferred grids in the middle of the panel.
addition of the catcher bag was also successful.

Recommendations
through easier
1/2" for Using a wider "oval" shaped grid may allow the fins of the fish to go
and it would allow more openings per grid. An increase in size from 2" to 2
the catcher bag would prevent the smaller Coho from getting gilled

Outcome Needs further Study
Sector Seine
SubSector Escape Grids

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Report # 145
ReportTitle 2000 Salmon Seine Selectivity Grid Study
ProjectTitle NA
Author J.O. Thomas and Associates
ReportDate January 2000
ProjectYear 2000
Proponents NA

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State	BC
Objectives catch prior to fishery.	To test a grid system in a purse seine for effectiveness in releasing by-brailing and to assess this methods practicality in a typical commercial fishery.
Gear	8 different grids of various shapes, sizes and colours.
Results Pink 6422 Chinook Coho 1352 10% 88% 1 0% through dark.	Phase 1 catch) Sockeye 2645 40% escaped. Coho 119 29% escaped. 3 5% escaped. Chum 635 6% escaped. Chinook 102 2% escaped. Jacks 65 18% escaped. Phase 2 catch) Sockeye 54 2% escaped. 59% escaped. Pink 1 100% escaped. Chum 4 0% escaped. Chinook 31 escaped. Chinook Jacks 105 33% escaped. Phase 3 catch) Coho 306 escaped. Pink 2 50% escaped. Chum 3665 0% escaped. Chinook Jacks 1 0% escaped. Of the escaped fish, 59% went through light grids and 41% through dark.
Conclusions without ability or	Selectivity grids are proven to safely and successfully release salmon human intervention. The grids are also proven to not impair the catching efficiency of a seine vessel respecting setting and frequency and onboard
Recommendations colour grid	EPDM and CIM membranes would be better if lighter colours could be attained. More studies on grid opening size and shape would be beneficial. Light on the bottom of the bunt may increase the escape of immature Chinook.
Outcome	Objectives Met
Sector	Seine
SubSector	Selectivity Grids

Report # 146

ReportTitle Area G Selective Gisheries Project. Comparison of Gear and Waterline
Release as

ProjectTitle NA

Author Archipelago Marine Research Ltd.

ReportDate NA

ProjectYear 2000

Proponents Gary Shepard and Walter Kempton

State BC

Objectives To test the effectiveness of waterline release compared to on board
revival tanks.
would be To determine whether fewer Coho would be caught using 7" plugs than
caught using conventional gear consisting of spoons, hootchies, flashers and
6 hooks. To also compare Coho mortality between #4 hooks and #6 hooks.

Gear plugs with #4 hook.	Control Gear) Spoons, hootchies, flashers with a #6 hook. Test Gear) 7" a #9 hook. 6" plugs with a #9 hook. Spoons, hootchies and flashers with a
Results caught 0.2 caught The 6" control. hour and mortality. at LB at 16.7% capture, %	Total Catch) 1348 Coho & 1383 Chinook. Plug Comparison) 7" plugs Coho per hour compared to the control of 4.5 fish per hour. The same plug 3.2 Chinook per hour compared to 7.0 fish per hour with the control plug. The 6" plug caught 1.7 Coho per hour compared to 4.9 Coho per hour using the control. The same plug caught 4.1 Chinook per hour compared to 5.9 Chinook per hour using the control plug. Hook size had very little difference to control for Coho and Chinook. Larger hooks resulted in hooking locations associated with high mortality. Waterline Release Results) 66 Coho were used for this test. 56 were VNB at capture, 5.4% mortality at release. 6 were VB, 66% mortality at release. 1 LB at capture, 100% mortality. 3 were dead at capture. Total Average Mortality = 16.7%. Revival Tank Results) 355 Coho were used for this test. 75 were VNB at capture, 1.3% mortality. 35 were VB at capture, 11.4% mortality. 145 were LNB, 19.3 %
Conclusions	Included within results.
Recommendations Use more time at	Continue testing plugs to try and increase catch rates of Chinook. avoidance strategies when areas have an abundance of Coho. Allow more the beginning of the project for the development of a coordinated fishing plan. Provide guidelines when using revival tanks for water flow, densities, etc.
Outcome	Needs Further Study
Sector	Hook and Line
SubSector	Commercial Troll

Report # 147.1

ReportTitle 2000 Fraser River Fishermans Society Fish Trap and Wheel Report

ProjectTitle NA

Author J.O. Thomas and Associates

ReportDate March 2001

ProjectYear 2000

Proponents Fraser River Fishermans Society

State BC

Objectives
migrating To target the Chum run on the lower Fraser River while selecting out co-species like Coho and Steelhead using a floating fish trap.

Gear
to check Wooden platform, 2 34' aluminum pontoons, net pen that could be raised the fish, 1 1/2" knotless webbing

Results
was 9 days of fishing caught 2 Chum, 1 Coho and 1 Steelhead. All by-catch released in condition 1, Vigorous Not Bleeding.

Conclusions The trap failed to capture any significant numbers of target and non target fish. All by-catch released in condition 1, VNB.

Recommendations Perhaps the Chum are avoiding capture because they tend to be bottom oriented.

Outcome Needs Further Study

Sector Alternate

SubSector Fish Trap

Report # 147.2

ReportTitle 2000 Fraser River Fishermans Society Fish Trap and Wheel Report

ProjectTitle NA

Author J.O. Thomas and Associates

ReportDate March 2001

ProjectYear 2000

Proponents Fraser River Fishermans Society

State BC

Objectives
migrating To target the Chum run on the lower Fraser River while selecting out co-species like Coho and Steelhead using a fish wheel

Gear
webbing) Plywood deck, two aluminum pontoons, motor, 4 baskets (1 1/2" knotless
Leads were 100 fathoms long made of 2" seine webbing.

Results 6 days fishing caught 69 Coho no Chum

Conclusions A lack of Chum caught by the wheel was a rather negative result.

Recommendations Perhaps the Chum are avoiding capture because they tend to be bottom oriented.

Outcome Needs Further Study

Sector Alternate

SubSector Fish Wheel

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Report #	136
ReportTitle Columbia	Catch and Release Mortality of Coho Salmon in the Fraser River, British Columbia
ProjectTitle	NA
Author	J.O. Thomas and Associates
ReportDate	NA
ProjectYear	1999
Proponents	Brent McCallum and Laurie Milligan
State	BC
Objectives the	To test the hypothesis that Coho mortality would be significantly higher in

likely take caused by	transition zone, saltwater to freshwater. Coho caught in this zone would bait more aggressively and already be experiencing physiological stress
Gear	Bar fishing gear and bait.
Results 31 Adults, jacks.	498 total Coho caught from both sites. Brownsville Bar (intertidal area) 261 Jacks. 30% Mortality. Duncan Bar (fresh water area) 38 adults, 168 27% mortality. Jacks had a slightly higher mortality than adults at both sites.
Conclusions observed at the stomach	There is no statistically significant difference between the mortalities two test sites. Jacks may have a slightly higher mortality rate due to their walls being thinner and less resistant to hooks than the adult Coho.
Recommendations current J-hooks would be of	Futher studies involving the use of circle hooks as opposed to the would be of interest. Angler education on catch and release techniques unarguable benefit to all stocks of Coho.
Outcome	Needs Further Study
Sector	Hook and Line
SubSector	Recreational

Report #	137
ReportTitle Recovery Box in	Physiological Evaluation of Sockeye Salmon Recovery Using the
ProjectTitle	Report of Interest
Author	A.P. Farrell, P. Gallagher, D.D. Pike
ReportDate	April 18, 2000
ProjectYear	1998
Proponents	NA
State	BC
Objectives reliable and fish a Blue challenges	1) Decide on the best available muscle sampling method to obtain reproducible estimates of muscle metabolites. 2) Establish whether or not showed physiological recovery after 1-2 hours in a Fraser Recovery Box and Recovery Box. 3) Evaluate the ability of fish to perform various swim following handling procedures. 4) Assess the effects of various levels of
Gear tissue	Nets pens, Anaesthetic (MS222 and Clove oil), 3 m diameter aquarium,
Results Chasing	All sampling methods caused an elevation in blood and muscle lactate. fish to lethargic and more lethargic states increases muscle and plasma

lactate levels beyond those observed in vigorous fish, and caused osmotic and ionic disturbances. Average maximum swimming speed did not differ significantly among the control, vigorous, lethargic and air exposed groups. 1/3 of the

lethargic fish did however fail to swim at all. ("non-swimmers") Both boxes promoted

Conclusions commercial It is unwise to immediately release lethargic fish after being caught in a fishery due to the possible inability to swim and avoid predators.

Recommendations None given.

Outcome Objectives Met

Sector Recovery Box

SubSector Recovery box

Report #	138
ReportTitle Recovery Box	Physiological Evaluation of Coho Salmon Recovery Using the Fraser
ProjectTitle	Report of Interest
Author	A.P. Farrell, P Gallagher, D.D. Pike
ReportDate	April 18, 2000
ProjectYear	1998
Proponents	NA
State	BC
Objectives hours in a fish to during between	1) To test whether or not fish showed physiological recovery after 1-2 Fraser Recovery box, or 24 hours in a net pen. 2) To evaluate the ability of swim before and after recovery. 3) Assess the effect of brief air exposure handling of fish on their subsequent recovery. 4) Establish a linkage physiological variables and the visual ranking system used by Fisheries and
Gear	NA
Results all categorized as actually died	The effect of air exposure on lethargic fish had the highest disturbance for all physiological variables. The level of metabolic recovery in muscle was similar between vigorous and lethargic fish. Of 29 fish that were visually "dead" after being transferred to the Fraser recovery box, only one fish 24 hours after capture. The "dead" fish swam well in the tunnel after they had
Conclusions after the fish the	Despite severe metabolic disruption, vigorous fish swim well shortly commercial capture. It was not possible to sample fish in a net pen without struggling somewhat causing additive stress. This made the comparison to the
Recommendations	Despite the "dead" visual assessment sometimes given to Coho,

these fish can return to active swimming with short term recovery in a Fraser recovery box.

Outcome Needs Further Study

Sector Gillnet

SubSector Recovery Box

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Report # 151

ReportTitle Beach Seine Survival Rates of Non Target Salmon Species: Skeena River

ProjectTitle NA

Author Allen S. Gottesfeld

ReportDate March 2001

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ProjectYear	2000
Proponents	Gitxsan First Nation
State	BC
Objectives	To monitor a beach seine ESSR fishery on the Skeena River to determine a 24 hour survival rate for captured non target species, and the overall interception rate.
Gear	Nylon, monofilament net, 30 - 100 fathoms long.
Results a net box caught 37	443 salmon were obtained following capture. They were then put in either in the flow of the river or in a plywood box in the river. 20,824 Sockeye were during this study. 98 Chinook, 2.04% mortality. 168 Coho, 2.98% mortality. Pinks with no mortality and 137 Steelhead, 6.43% mortality.
Conclusions Plywood recovery than	The proportion of Sockeye to each by-catch species is less than 1%. boxes, for recovery, seemed to keep the fish calmer leading to a better recovery than
Recommendations	It would be useful to sample additional fishing sites in 2001 studies.
Outcome	Objectives Met
Sector	Seine
SubSector	Beach Seine

Report #	152
ReportTitle	Selective Seine Fishery In-Water Sorting - 2001
ProjectTitle	NA
Author	Don Sinclair R.P. Bio.
ReportDate	NA
ProjectYear	2000
Proponents	NA
State	BC
Objectives sorting stress methods.	To evaluate equipment used for sorting, a converted skiff with a built in trough, and to document its effectiveness in sorting by-catch. To compare levels off the by-catch during conventional brailing and in water sorting
Gear water.	Converted skiff with a built in sorting trough so fish could be sorted in the

Results and the Due to the bunt getting caught in the bow thruster the catch was cut loose
test was cancelled and not repeated that season.

Conclusions Results were disappointing but on the positive side new sorting
equipment has been purchased and is available for testing in the 2001 season.

Recommendations Ns

Outcome Needs Further Study

Sector Seine

SubSector In-water sorting

Report #	153
ReportTitle	Area E Gillnetters Association 2001 Chum Selectivity Project
ProjectTitle	NA
Author	J.O. Thomas and Associates
ReportDate	January 2002
ProjectYear	2001
Proponents	Ken Connelly
State	BC
Objectives 10 foot	To test a traditional Chum net and a gillnet of identical mesh size with a weedline to determine the reduction in target and non-target catch.
Gear 100 fathom vessels for	Control Net - 100 fathom nets ranging from 6 1/4" - 7" mesh. Test Net - nets ranging from 6 1/4" - 7" mesh with a 10 foot drop weedline. Two each fishing zone, one with a control net and the other with the test net.
Results Sockeye, 133 in the 9.84% in small	5 days of fishing caught 12, 611 Chum, 516 Coho, 72 Chinook, 1 Pinks and 10 Steelhead. Seven out of the eight vessels showed an increase in the Chum : Coho ratio for the test net over the control. A general reduction of Chum efficiency for the test net and a reduction of 38.07% for Coho. Chinook distribution was the same for the two nets and the Steelhead sample was too small
Conclusions this net	Eliminating the top 1/3 of a gillnet shows signs of reducing Coho bycatch considerably while reducing the Chum catch slightly. Commercial viability of this net would have to be discussed between industry and DFO.
Recommendations	Obtaining a larger sample for Steelhead would be more conclusive.

Outcome Objectives Met
Sector Gillnet
SubSector Weedline

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Report # 154
ReportTitle Experiment 2001 Southern Area E Gillnetters Association 8 inch Modified Gillnet
ProjectTitle NA
Author J.O. Thomas and Associates
ReportDate December 2001
ProjectYear 2001

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Management\Gordon Curry\Cohen - Gord Curry\2005\Fi
sheries Management>Selective Fishing\

Proponents	Mike Robinson
State	BC
Objectives traditional larger gilled or	To examine the feasibility of using large 8" mesh gillnets of both multistrand and Alaska twist webbing to capture Chinook salmon which are and to allow the smaller Sockeye to pass through the net without becoming
Gear fathoms of 3 : 1, ratios	Test Nets : 50 fathoms of 6 strand Alaska twist 8", 60 meshes deep. 50 multistrand, 8". The control net was 5" multistrand webbing hung at a ratio of 100 fathoms long and 60 meshes deep. Both the 8" net types were tested at ratios
Results Sockeye, 20 Chinook. The caught 40	76.65 total fishing hours, 111 sets. The 5" traditional net caught 2235 Chinook. The Alaska twist net hung at 2.2:1 caught 28 Sockeye, 113 2.2:1 Multistrand caught 25 Sockeye, 78 Chinook. The 3:1 Alaska twist Sockeye, 78 Chinook. The 3:1 Multistrand caught 59 Sockeye, 59 Chinook.
Conclusions comparison of while the magnitudes of	The most dramatic evidence of the selectivity of the 8" test nets is the the ratios of Chinook to Sockeye CPUE. The 5" net had a low ratio of 0.01 various configurations of 8" nets ranged from 1 to 4.04, (at least 2 greater than the 5" net). Lower hand ratios seemed to have a higher CPUE
Recommendations in the	The total catch was relatively low due to the project being hindered by limited fishing time. More fishing effort and higher catches would result in the trends found
Outcome	Objectives Met
Sector	Gillnet
SubSector	Mesh size

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Report #	155
ReportTitle 2001, Lower	First Nations and Commercial Sector Selective Fisheries Final Report
ProjectTitle	NA
Author	Russ Jacobson
ReportDate	January 2002
ProjectYear	2001
Proponents	Russ Jacobson
State	BC
Objectives gillnet and a	To compare Sockeye and Coho catch efficiency on an Alaska Twist

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sheries Management>Selective Fishing\

Multi-strand gillnet. Mortality of the Coho is also of interest in this study.

Gear mesh 1 net. 100 fathoms of 5 1/4" 60 mesh Alaska Twist, 100 fathoms 5 1/4" 60

Multi-strand both with a standard ratio.

Results 14 sets. 821 Sockeye, 471 in the Multi-strand. 4 Chinook and 1
Sturgeon. Half of
the Chinook were caught in the Multi-strand net.

Conclusions to untangle Performance of the nets in catching fish were similar. Fish were easier
out of the Alaska Twist net.

Recommendations To test for more than 1 day when both Sockeye and Coho are
present. 200 fathoms
of net is too much to handle when peak runs occur.

Outcome Needs Further Study

Sector Gillnet

SubSector Alaska Twist

Report # 156

ReportTitle 2001 Fraser River Mesh Size and Mortality Study

ProjectTitle NA

Author J.O. Thomas and Associates

ReportDate December 2001

ProjectYear 2001

Proponents Mark Petrunia

State BC

Objectives sizes of lowest non To test a 3 1/2" tooth-net in a Sockeye and Chum fishery against other gillnets to determine the most viable net for target species catch with the lowest non

Gear Sockeye 75 ratio. 7" 60 ratio of Two different nets. 1 panel tooth-net, three panels various gillnet sizes. net: 3 1/2" tooth-net 120 mesh, 2nd panel 5 1/4" 80 mesh, 3rd panel 5 5/8" mesh, 4th panel 6" 70 mesh. All nets were #19 stranded nylon hung at 3:1 Chum net: 3 1/2" tooth net 120 mesh, 2nd panel 6 1/2" 65 mesh, 3rd panel mesh, 4th panel 7 1/2" 56 mesh. All nets were #23 stranded nylon hung at a

Results 1 Chinook. : 3 1/2" - Sockeye fishery : 3 1/2" - 23 Sockeye, 1 Sturgeon. 5 1/4" - 109 Sockeye, 5 5/8" - 109 Sockeye, 2 Chinook. 6" 99 Sockeye, 1 Chinook. Chum Fishery : 3 1/2" - 118 Chum, 76 Coho. 6 1/2" - 526 Chum, 44 Coho. 7" - 472 Chum, 22

Coho. 7
the 3
the lowest

1/2" - 470 Chum, 15 Coho. Chum : Coho net mortality ratio was 11.18:1 for
1/2". 80.29:1 for the 6 1/2". 236:1 for the 7". 253:1 for the 7 1/2". 7" had

Conclusions
did not
relationship

The sample size of Sockeye was too small to draw any conclusions and
contain any Coho. The Chum:Coho ratio increases with net size. This
is repeated in the Chum:Coho mortality ratio as well.

Recommendations Obtain larger sample size for the Sockeye and Coho comparison.

Outcome Needs Further Study

Sector Gillnet

SubSector Toothnet

Report #	157
ReportTitle	2001 Lower Fraser River Selective Fishing Group Project
ProjectTitle	NA
Author	J.O. Thomas and Associates
ReportDate	November 2001
ProjectYear	2001
Proponents	Harold Yoneda
State	BC
Objectives gillnets for	To compare the catch efficiency between Alaska Twist and Multi-strand Sockeye and Chinook.
Gear Alaska Twist hung at a were 60.	9 vessels each with 1 net consisting of 4 panels of alternating between and Multi-strand webbing. Each net was 200 fathoms long with 5" mesh ratio of 2.2-2.4:1. Three vessels had nets 90 meshes deep while the rest
Results caught and 462.75:1. - 275:1.	22,348 Sockeye retained. 68 Chinook, 3 Coho and 46 Sturgeon were released. Sockeye : Chinook Catch ratios: 90 mesh nets: Alaska Twist - Multi-strand - 245.44:1. 60 mesh nets: Alaska Twist - 399.75:1. Multi-strand
Conclusions Sockeye to of	The Alaska Twist mesh panels consistently demonstrated a higher Chinook catch ratio than the Multi-strand panels. The relatively small sample Chinook makes the findings of this study less reliable given the duration of the
Recommendations	NA
Outcome	Objectives Met
Sector	Gillnet

SubSector Alaska Twist

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Report #	158
ReportTitle Catch Rates	Area E Selective Fisheries Gillnet Project 2001 - Comparison Study of
ProjectTitle	NA
Author	Dave Kadyschuk and Gord Bennett
ReportDate	NA
ProjectYear	2001
Proponents	Dave Kadyschuk

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sheries Management>Selective Fishing\

State	BC
Objectives species using a	To test and compare catch rates for both sockeye and non-target standard multi-strand mesh gillnet and an Alaska Twist mesh net.
Gear Alaska	2 boats with 2 nets each. Each net was identical except for it being either twist or Multi-strand. 200 fathoms long, 5", 90 meshes deep.
Results sockeye per set. chinook per	Average catch per set for each net type: Alaska twist: 35 sets. 68.3 0.2 Chinook per set. Multi-strand: 26 sets. 146.4 sockeye per set. 1 set. 6207 total sockeye. 27 chinook with a 26% mortality.
Conclusions the Alaska species was catch by a	As a result of th limited fishing opportunity, the objective of comparing Twist to the Multi-strand in terms of catch for both target and non target not met. The Multi-strand outperformed the Alaska Twist in total sockeye
Recommendations the 2 1/2 days that It was conducting between	There was a substantial amount of data that was collected during may be able to be used in the design of future studies within the gillnet fleet. recommended that there be the establishment of better parameters for gear comparisons and to allow more time to conduct a proper comparison
Outcome	Needs Further Study
Sector	Gillnet
SubSector	Alaska Twist

Report #	159
ReportTitle	2001 Salmon Seine Selectivity Study
ProjectTitle	NA
Author	J.O. Thomas and Associates
ReportDate	January 2002
ProjectYear	2001
Proponents	Paul Brajcich
State	BC
Objectives of various objective grids.	To gather information and test the effectiveness and relative selectivity grid designs in a variety of different fisheries and conditions. An additional objective was to measure the efficiency of a new vessel and crew to the deployment of grids.
Gear materials. A	10 different grids consisting of various sizes, shapes, colours and

went catcher bag was placed on the outside of the grids to catch the salmon that

Results (26%) caught through Steelhead All three phases of the study: 204 sets - 32 611 salmon caught. 8 635 by the grid test vessels through the grids. Totals of Species that escaped the grids: Coho 60%, Chinook 4%, Sockeye 28%, Pink 31%, Chum 4%,

Conclusions The escape of 26% of the fish caught in the seine net via grids is graphic proof of the response of salmon to holes in the net and importance of this behavior to the future utility of this selective fishing tool.

Recommendations Future experimentation with grids would benefit from using variable sized grid openings with increments of 6mm reductions. Conservation concerns for Pink salmon will benefit from the deployment of oblong shaped grids which readily pass Pinks but restrict the loss of Chum and Sockeye. Once an optimal size and shape of grid is determined from futher experimentation, DFO should expand th testing and

Outcome Objectives Met

Sector Seine

SubSector Selectivity Grids

Report # 121

ReportTitle Selective Gillnet First Nations and Commercial Sector Selective Fisheries Project.

ProjectTitle NA

Author Archipelago Marine Research Ltd.

ReportDate NA

ProjectYear 2000

Proponents Dave Kadyschuk.

State BC

Objectives species and to test the economic viability of the test net.

Gear mesh chum weedline 1 net, 2 panels- 1 control and 1 test. Control - 50 fathoms, 6 3/8", 60 gillnet. Test net - 50 fathoms, 6 3/8", 60 mesh chum gillnet with a 20' drop

Results chinook, 2 chinook. Control net: 71.5 hours fished. 1800 chum, 4 steelhead, 117 coho, 14 sturgeon. Test - 63.7 hours fished. 928 chum, 3 steelhead, 63 coho, 5 chinook. The control net caught 82% of the chum at depths greater than 10 feet. Zero catch of steelhead was greater than 20 feet. Coho was fairly consistant for all depths. The

majority of the chinook were caught between 6-10 feet. 29% were caught at 10-20

Conclusions The control panel caught 66% of the target fish in the study while catching 74% of the chinook, 65% of the coho, and 57% of the steelhead. The test net caught less by-catch, however it also caught less target species. Viability of the test net would

Recommendations Additional testing opportunities could include a comparison of fishing between areas, time of day and/or tides to determine whether lower catch rates for non-target

Outcome Objectives Met

Sector Gillnet

SubSector Weedline

Report #	119
ReportTitle Fishery.	Area D Salmon Gillnet Association Selective Fisheries Project. Sockeye
ProjectTitle	NA
Author	Archipelago Marine Research Ltd.
ReportDate	NA
ProjectYear	2000
Proponents	Area D - Salmon Gillnet Association
State	BC
Objectives and their during box and conduct the Chum. half which vessels strand net	To identify areas of coho abundance. To test various net configurations maortality rates. To conduct time of day experiments to compare catch rates day and night. To compare Coho mortality rates using the standard revival the new "Fraser" style recovery box. A second part to this study was to same design of a study on the West Coast of Vancouver Island targeting The study was then moved to area 14 near Qualicum but only last one and a days. The study was cancelled to the the presence of sea lions in the area affected the fishing operations. There was a total of 191 chum caught by 6 in 34 sets. The only observation about selective fishing was that the multi
Gear ratios.	3 groups, 3 vessels per group. Alaska Twist gill nets with variable hang Same mesh size and depth.
Results 1.4%	Total Catch : 23 385 salmon. 48.5% pinks. 47.8% sockeye. 1.4% chum. coho. 0.2% chinook. 0.2% steelhead. 0.5% Atlantics. Time of day

comparison:	Specific areas had variable catch rates for specific time periods. Revival
Tank	Comparison: No trends were shown that would indicate one revival box
shown	outperforming the other. Hang Ratio Comparison: There were no trends
Conclusions during morning set catch.	that would suggest a specific hang ratio to avoid catching less coho or more
difference was trends would	In specific areas, coho catch could be limited when fishing for sockeye certain times of the day/night. In general, restricting fishing to after the (0400-0600) and not during the first dark set (2000-2200) would reduce coho catch. Hang ratio comparison showed little difference therefor no statistical difference was found. Revival tanks are of obvious benefit to the recovery of coho but no trends were found when comparing the Fraser style box to the standard style that would
Recommendations tanks decrease recover by	During the study there was mortality to coho due to the revival tanks not functioning properly. Clear guidelines on specific parameters for operating the revival tanks should be included for further studies. Shorter soak times would surely decrease the by catch mortality rate and allow more coho to be given a chance to recover by
Outcome	Objectives Met
Sector	Gillnet
SubSector	Revival Box

Report #	167
ReportTitle Northern	1999 Coho Catch and Release Mortality Studies (Marine Recreational) in
ProjectTitle	NA
Author	Steve Cox-Rogers
ReportDate	January 2000
ProjectYear	1999
Proponents Sound	Prince Rupert Local Sport Fishing Advisory Committee and Chatham
State	BC
Objectives recreational fishing	To determine Short term mortality of Coho caught by various gear in different areas in the North Coast of British Columbia.
Gear	Motor mooched herring, trolled herring and troll artificial lures
Results of 0.099	627 coho caught. 62 died for a combined gear/study area mortality rate
Conclusions types. The major term mooched deep	Short term mortality was not significantly different between various gear types. The range was 0.049 - 0.221. 0.221 at Langara, 0.111 at Dundas and 0.049 at Stephens. For all gear treatments tested, hook location was found to be the factor associated with hooking mortality. Fish size may also influence short term mortality rates for some gear treatments. Larger coho captured on motor herring tended to be more aggressive and were able to ingest baits into the deep
Recommendations short term	Further studies should focus on the degree of seasonal variation in mortality rates, by gear treatment, within specific fisheries where exploitation

rates
management are significant or where the impact of catch and release fishing is of

Outcome Objectives Met

Sector Hook and Line

SubSector Recreational

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Report # 165

ReportTitle Effects of Gear Type on Sexual Selectivity and Short Term Mortality
Following Catch

ProjectTitle NA

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sheries Management>Selective Fishing\

Author	Darrell Otto
ReportDate	November 1999
ProjectYear	1999
Proponents	Darrel K. Otto
State	YK
Objectives selectivity as chinook	The primary objectives of this study were to determine if there is sexual it relates to specific types of terinal gear utilized within the Yukon River salmon recreational fishery. Also, an indication of baseline rates of short term mortality due to catch and release practices should be established.
Gear	Typical river angling gear for chinook salmon.
Results were males. was the	28 salmon held for observation. 2 mortalities. 75% of the fish caught The upper and lower lip was the most common hooking area. Salmon roe
Conclusions subsequent poor obtain a or	Due to the low numbers of returning chinook salmon and the harvest in the Tatchun Creek sport fishery in 1999, it was not possible to statistically significant sample for determining sexual selectivity of gear types
Recommendations	NA
Outcome	Needs Further Study
Sector	Hook and Line
SubSector	Recreational

Report #	164
ReportTitle Program	1999 Overview Report on the Lower Skeena River Catch Monitoring
ProjectTitle	NA
Author	Jim Culp and a second report by J.O. Thomas and Associates
ReportDate	October 31, 1999
ProjectYear	1999
Proponents Advisory	Terrace Salmonid Enhancement Society and Terrace Sportfishing
State	BC
Objectives Skeena River result of	To determine if the by-catch of coho salmon was significant during the chinook salmon sport fishery. To determine if anglers were selective as a

Gear present may	Various river angling gear mainly for chinook salmon. Many other species so some anglers may have targeted other salmon therefore alternate gear
Results fly 143 head or	221 chinook, 46 coho, 56 steelhead, 185 pinks, 59 sockeye. 1465 anglers interviewed. Of those 1465, 8 were bottom bouncing, 24 spin casting, 181 fishing, 1243 still fishing, 9 unknown. Of the fish landed, 266 were active not bleeding, 50 active bleeding, 13 lethargic not bleeding, 11 lethargic bleeding, 143 dead, 136 unknown. Hooking locations: 172 deep, 363 outer mouth, 36
Conclusions many coho use of	The chinook sport fishery was selective in that it did not catch very relative to the total number of these fish migrating through the fishery. The use of large #0 and #2 spin-n-glos in conjunction with barbless hooks made this
Recommendations lower bars to on back to	There should be a closer examination of the bait fishery on the determine if more coho are caught using bait compared to artificial lures. Consideration should be put into an educational program on how to land fish gravel bars to improve the survival rate of the species that must be returned
Outcome	Objectives Met
Sector	Hook and Line
SubSector	Recreational

Report # 163

ReportTitle Final Report of a Selective Sport Tackle Study in Juan De Fuca Strait.

ProjectTitle NA

Author W.R. Harling

ReportDate NA

ProjectYear 1999

Proponents Wayne Harling and Rita Frederiksen

State BC

Objectives To test the selectivity of certain tackle for pinks and sockeye versus
coho with the objective of being able to use tackle that minimized incidental interceptions of
coho.

Gear Bare hooks of various colours with flashers of various colours. Normal
sockeye and pink gear (small pink hootchies). Anchoivies, action lures, green hootchies.
Control flashers that would normally catch coho.

Results 71 charter fishing days. 1180 salmon. 476 pinks, 53 sockeye, 572 coho
and 79 chinook. Bare Hooks: 130 pinks, 15 sockeye, 129 coho, 15 chinook. Pink
Gear: 210 pinks, 19 sockeye, 183 coho, 22 chinook. Coho Gear: 97 pinks, 16
sockeye,

Conclusions numbers that hootchies to Neither sockeye nor pinks were present in Juan de Fuca strait in the were originally anticipated. The use of either bare hooks or small pink target sockeye and pinks produces a significant reduction in the incidental

Recommendations when pinks and sockeye are abundant to compare results. It is recommended that this study be repeated I a subsequent year

Outcome Needs Further Study

Sector Hook and Line

SubSector Recreational

Report # 162

ReportTitle Fraser River Coho (Oncorhynchus kisutch) Encounter Study

ProjectTitle NA

Author A. Heaton and M. Laynes

ReportDate January 15, 2000

ProjectYear 1999

Proponents Mark Laynes

State BC

Objectives To determine whether recreational anglers could actively angle for specific salmon species while avoiding coho salmon.

Gear Bottom Bouncing Gear. 1/0 or 2/0 single barbless hook with wool, corkies, spin-n-

Results 2266 fish angled, 77.89% pinks, 12.49% sockeye, 3.44% chum, 3.44% chinook, 0.13% coho and 2.6% other. 1709.04 angler hours.

Conclusions The results suggest that coho may be avoided by anglers when using the bottom bouncing technique while coho are migrating with other salmon.

Recommendations Opening the Fraser River to salmon fishing on specific dates, times and locations using certain gear would allow FOC to change the Fraser River from a Red Zone management area to perhaps a Special management area.

Outcome Objectives Met

Sector Hook and Line`

SubSector Recreational

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Report #	169
ReportTitle the Mouth of	The Study of Selective Sportfishing Gear Types in Area 29 Adjacent to
ProjectTitle	NA
Author	David Korsch
ReportDate	NA
ProjectYear	1999
Proponents	Wayne Michie
State	BC

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Objectives readily take to the sockeye	To test the hypothesis that during late summer months coho do not lures (either traditional coho/chinook lures or red gear) in the waters adjacent mouth of the Fraser River; therefore, it is possible to fish in the area for and pink salmon using red gear with minimal impact on coho.
Gear	Red Gear. Traditional coho/chinook lures.
Results Other- 2.	Sockeye and Pinks: Red Gear- 35. Other- 20. Coho: Red Gear- 0.
Conclusions attach any	While the results are encouraging, additional data is required in order to statistical significance to it.
Recommendations	Continue study when a larger sample size is attainable.
Outcome	Needs Further Study
Sector	Hook and Line
SubSector	Recreational

Report #	168
ReportTitle the Mouth of	The Study of Selective Sportfishing Gear Types in Area 29 Adjacent to
ProjectTitle	NA
Author	David Korsch
ReportDate	NA
ProjectYear	1999
Proponents	Brent McCallum and Laurie Milligan
State	BC
Objectives terminal terminal	To test the feasibility of using bare hooks behind flashers as effective tackle for the harvest of sockeye and pink salmon, and to compare this tackle to traditional "red gear" designed to catch sockeye and pinks.
Gear hoochies.	Bare hooks - red, behind a flasher. Red gear - small pink or red coloured
Results 3. Bare	Sockeye and Pinks: Red Gear - 33. Bare Hooks - 27. Coho: Red Gear - 3. Bare
Conclusions significant due bare	While some of the results are encouraging, they are not statistically significant due to the small sample size and larger number of zero catch days. The use of bare

hooks eliminated the capture of either chinook or coho adults.

Recommendations Continue this study when a larger sample size is more attainable.

Outcome Needs Further Study

Sector Hook and Line

SubSector Recreational

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Report # 150

ReportTitle A Comparison of the Standard Recovery Box and a Re-designed
Lamminar Flow

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sheries Management>Selective Fishing\

ProjectTitle	NA
Author	M. Berry, P. Gallagher, A.P. Farrell, S. Buchanan, D. Pike
ReportDate	NA
ProjectYear	2000
Proponents	Inner Coast Natural Resource Centre
State	BC
Objectives laminar flow box in	To compare the standard seine recovery box to a newly designed terms of their abilities to promote recovery in coho salmon
Gear 50' net pen.	Seine Gear. Standard recovery box. Laminar flow recovery box. 50' x
Results 19.4% rate. In	After 24 hours in a holding pen. Standard Recovery Box : 36 fish, 7 dead, mortality rate. Laminar Flow Recovery Box : 60 fish, 2 dead, 3.3% mortality the swim challenge, all fish had the same level of swimming ability after 24 hr
Conclusions recovery than	This study provides evidence that the laminar flow box promotes better the standard recovery box for seine caught coho salmon.
Recommendations the laminar flow	Additional research is needed to determine the effects of the use of recovery box in the context of the commercial seine fishery.
Outcome	Objectives Met
Sector	Seine
SubSector	Recovery boxes

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Report # 114

ReportTitle Area 4 Selective Seine Experiment, July-August 2000 M/V Nimkish
Producer, M/V

ProjectTitle

Author

ReportDate

ProjectYear

Proponents Mark Wells

State

Objectives

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Gear

Results

Conclusions

Recommendations

Outcome

Sector

SubSector

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sheries Management>Selective Fishing\

Report #	160
ReportTitle Practices and	2001 Selective Seine Project. Increasing Selectivity of Harvesting
ProjectTitle	NA
Author	John Legate and Ron Ross
ReportDate	NA
ProjectYear	2001
Proponents	John Legate and Ron Ross
State	BC
Objectives could be ability to against selective	To study the effects of air exposure to determine the length of time coho kept out of water before the effects of anoxia irreversibly damages their recover. To test and compare a newly designed directional flow revival tank the industry standard. To collect and develop video documentation of
Gear	Standard and directional flow revival tanks. Standard seine net.
Results coho, 7 on the others chum, 10 next from flow	First fishery (proof of concept fishery) : Total catch = 5459 sockeye, 6 chinook. Air exposure study : 281 sockeye sampled. Held for various times deck of the boat up to 12 minutes. The next morning there were 35 dead, all were vigorous not bleeding. Coho fishery : Total catch = 54 coho, 1125 pink, 1 chinook. Air exposure study : 53 coho, 139 chum were sampled. The morning there were 7 dead coho and 42 dead chum. There were no results the revival tank comparisons due to operational problems with the directional

Conclusions condition exposure. minute Due to an operational

A common trend in the air exposure portion of the study was that fish began to deteriorate from vigorous to lethargic at the 4 minute mark of air exposure. More mortalities were observed the longer the fish is out of water past the 4 minute mark. The shorter the exposure time, the greater the chances of recovery. Due to an insufficient number of fish that were sampled and also due to some operational

Recommendations the directed flow tank

The current design of the "slings" to hold fish in front of the flow in the directed flow revival tank was not effective. More time was needed to complete the revival tank

Outcome Revival tank comparison needs further study

Sector Seine

SubSector Revival tanks

Report # 139

ReportTitle Design and Construction of Fishtrap for the Lower Skeena River

ProjectTitle NA

Author Jon Mikkelsen, William Beynon, Clyde Smith

ReportDate March 31, 2000

ProjectYear 1999

Proponents Tsimshian Tribal Council

State BC

Objectives would withstand strong currents, debris accumulation, be adoptable for a variety of different sites and most importantly, be compatible with the natural instincts of the migrating salmon.

Gear fishtrap. Trap incorporates three sections and is based on the Metlakatla (alaska) mounted on two pontoons and has a frame of wood and aluminum. Net has not yet been

Results See Conclusions (included)

Conclusions expectations. The The final design and pre-assembly of the fish trap exceeded all selected design proved to be very versatile and allows for easy changes out in the field. The designers feel the use of the rigid frame to maintain the netting shape will be adequate to withstand the strong and variable currents of the lower Skeena River.

Recommendations on the It is recommended that a full season of testing should be performed on the Tsimshian fish trap during the upcoming 2000' fishing season. Catch rates, environmental parameters and fish behavior should be incorporated. It is also

overall recommended that a bubble lead be designed and tested as part of the

Outcome	Objectives Met
Sector	Alternative
SubSector	Fish Trap

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Report #	176
ReportTitle	Results of a Selective Sport Tackle Study in Juan De Fuca Strait
ProjectTitle	
Author	W.R. Harling
ReportDate	NA

ProjectYear	2001
Proponents	W.R. Harling
State	BC
Objectives bare hooks	To determine whether Coho can be avoided using either pink, red or during a typical sockeye and pink sport fishery.
Gear	Red Gear. Hootchies and bare hooks.
Results jack coho, 46 327 adult	Total catch by area : Sooke : 60 sockeye, 455 pinks, 346 adult coho, 86 adult chinook and 2 jack chinook. Port Renfrew : 125 sockeye, 723 pinks, coho, 92 jack coho, 26 adult chinook and 9 jack chinook.
Conclusions results in a scarce or salmon in hooks and during	The use of small, pink hootchies to target sockeye and pink salmon significant reduction of maturing coho interceptions when all species are abundant. Based on the results of this and the 1999 study, angling for the "offshore" areas of Juan De Fuca Strait, if restricted to the use of bare pink gear, would have considerably less impact on Coho stocks of concern
Recommendations which were future it is projects.	Barbless hooks led to the loss of many coho at the side of the boat going to be checked for adipose fin and DNA collected from them. In the recommended that an exception be made to this regulation for similar
Outcome	Objectives met
Sector	Hook and Line
SubSector	Recreational

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