

Rat River Char Fishing Plan

2010 - 2013

RAT RIVER CHAR FISHING PLAN

2010-2013

This plan was prepared by the Rat River Working Group, on behalf of the Ehdiitat Renewable Resource Council (ERRC), the Teetl'it Renewable Resource Council (TRRC), and the Aklavik Hunters and Trappers Committee (AHTC). Support was provided by Fisheries and Oceans Canada (DFO), the Gwich'in Renewable Resources Board (GRRB) and the Fisheries Joint Management Committee (FJMC).

GOALS OF THIS FISHING PLAN

- To maintain a healthy stock of char in the Rat River system.
- To maintain and manage the Rat River Dolly Varden char fishery for the continued use and enjoyment by the Gwich'in and Inuvialuit people.
- To encourage co-operation among all users to ensure sound management of the Rat River char stock.

BACKGROUND

The need for this plan was first identified at the first Rat River Char Workshop, held in Aklavik on January 25, 1995. In June 1995, January 1996, and March 1996, delegates from the Ehdiitat RRC, Aklavik HTC and Teetl'it RRC met to prepare the first edition of the Fishing Plan. It was finished and signed in Aklavik, NT, on June 14, 1996.

The plan is revisited and updated annually. The seventh and most recent edition of the plan was signed in 2004 and has not required updating until now.

It was appropriate to update the plan in 2010 due to the development of the Dolly Varden Char Integrated Fisheries Management Plan (IFMP) and the moderate rebound of the char population following declines in the mid 2000s.

The present plan represents the consensus of the Rat River Working Group following a full meeting in Inuvik on March 23, 2010 and follow up with the affected communities. The plan will continue to be revised and updated as necessary and as new information is available on the stock and the fishery. The plan represents the consensus of all signatories to the plan, and belongs to the communities and the users of the Rat River char resource.

ABOUT DOLLY VARDEN CHAR AND THE RAT RIVER

All Dolly Varden in Arctic Canada belong to the northern subspecies, *Salvelinus malma malma*. The northern subspecies occurs from the north side of the Alaskan Peninsula and the Aleutian Islands to the Mackenzie River in Canada's Western Arctic. In the GSA and ISR they are found, from west to east, in the Fish, Malcolm, Firth, Babbage, Big Fish, Rat (Ddhah Zhit Han) and Vittrekwa rivers and along the coast west of the Mackenzie Delta.

Dolly Varden use a variety of habitats. During winter, they live in the upstream reaches of river systems that do not completely freeze over due to warm water springs. Habitats associated with warm water springs are used for spawning, rearing and overwintering, but they are not very common, so they limit the amount of Dolly Varden that can survive in these streams. Small streams are used for spawning, rearing and overwintering. Larger rivers are migratory routes of anadromous Dolly Varden, and nearshore marine habitats are feeding areas.

The Rat River flows from the Richardson Mountains, following a 130 km (80 mi) course before entering the Husky Channel of the Mackenzie River 35 km (22 mi) to the north-west of Fort McPherson, NT. One of the main tributaries to the Rat River, Fish Creek, has many deep pools and is fed by one or more year-round warm water springs. Water temperatures at the spring source area are in the 4-5°C range. These springs maintain open water areas year round, which are used by Dolly Varden for spawning, rearing and over-wintering.

The Gwich'in and Inuvialuit people have long depended on the Rat River char for winter sustenance. These fish, called *dhik'ii* by the Gwich'in and *qalukpik* by the Inuvialuit, continue to be an important element of diet, tradition and culture to the present day. There are presently an estimated 190 head-of-household Gwich'in harvesters in Aklavik and Fort McPherson combined, and of these, an average of 18 (9.4%) report regular annual harvests of Rat River Dolly Varden.



Male char. GRRB photo.



Rat River Fish Holes, July 2010. DFO photo.

HOW MANY CHAR ARE IN THE RAT RIVER?

The size of the stock was estimated through tagging in 1995, 1997, 2001, 2004, 2007 and 2008, and recapture in 1996, 1998, 2002, 2005, 2008 and 2009, resulting in population size estimates for the tagging year. **Example:** Tags placed on fish in 2007 and recaptured in 2008 can aid in estimating the population size at the time of tagging in 2007. Recaptured fish also provide information of growth rates and repeat spawning percentages.

The estimates from this work are very close to each other's confidence regions, and therefore no major changes in the size of the stock were detected using this method for the period between 1989 and 2002. A significant downward trend in population size was noticed for the first time in 2004, indicating less than 3000 fish in the population. This led to a voluntary closure of the fishery in 2006, 2007 and 2008. Subsequent population estimates in 2007 and 2008 have indicated that the population may be recovering from this decline. The 2009 population estimate is somewhat lower than the 2008 population estimate. This, along with other available data, indicates that there may only be one age group of char supporting the population. Over the last two years, there have been many adult spawning fish at the fish holes, and not very many juvenile char, or 'silvers'. If the trend continues and there are few 'silvers' in the population, it could indicate that the population is about to decline.

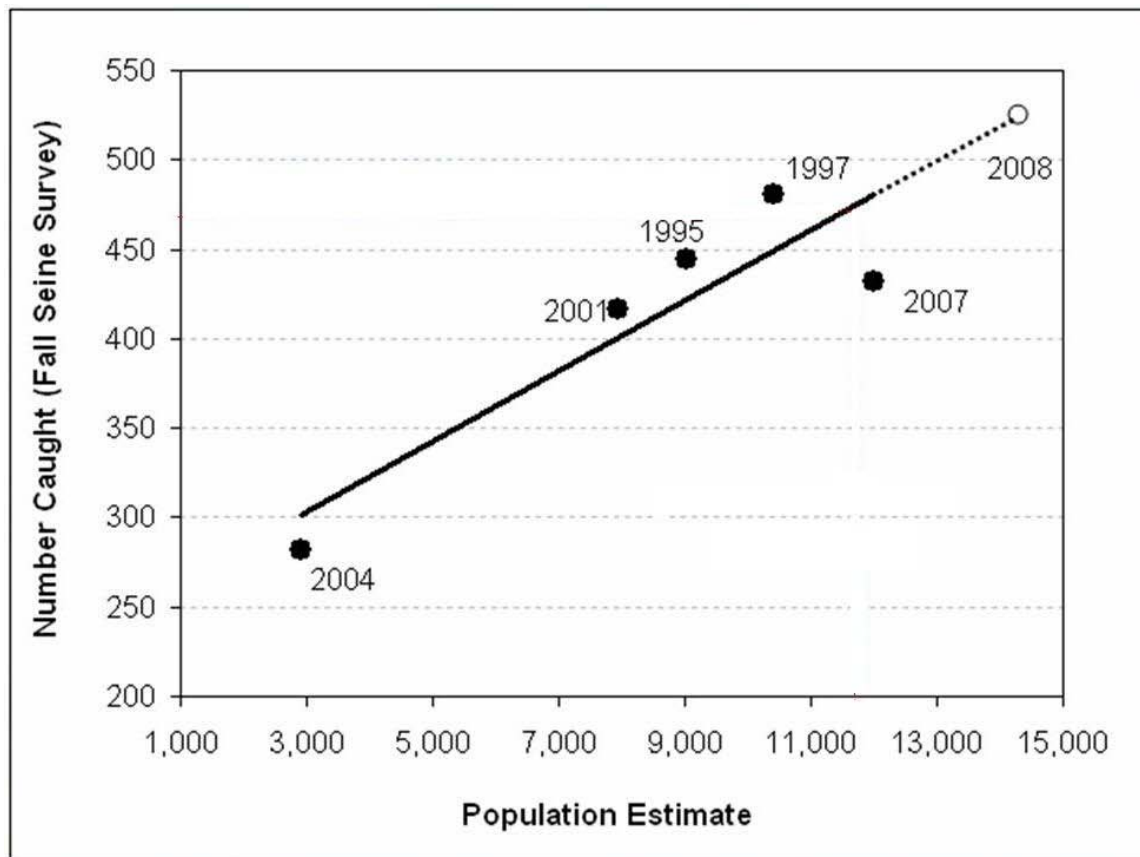


Figure 1. Population estimate of Rat River char vs. the number of char seined at the Fish Hole during the fall assessment. This graph indicates that the number of fish caught in the seine survey at the fish hole can be an indicator of how many fish are in the population.

STOCK TREND

Stock size estimates from the 1990s and early 2000s, although few in number, indicate no major change in the size of the stock. Estimates from the mid 2000s indicate that the stock suffered a significant decline, probably due to overharvest in the late 1990s. Higher harvest rates from 1996 to 1998 correspond with population declines one generation (2002-2004, approx 6 years) after the overharvest. Figure 3 below shows the reported harvest, and suggested harvest limits for the years from 1995 to 2009. Harvest guideline is based on estimated population size and number of char harvested is estimated through reported harvest.

Harvesters have observed a decrease in the abundance of fish in the early 2000s, and felt this was consistent with biological data which shows a downturn in the stock for those years. More recently, char monitors have indicated that CPUE has increased and there seems to be more char than a few years ago. This observation is supported by recent population estimates. Char monitor CPUE may be a good proxy to use in the future when thinking about ways to estimate stock size without tagging. The CPUE (catch-per-unit-effort – how many char a monitor catches

per net per day) in the 2000-2003 period shows a downward trend that was apparent at all four monitoring stations. Average age and average length of char caught in the subsistence fishery also show a downtrend in the same period. The proportion of males in the catch also decreased. Suggested harvest level was decreased after 2003 as it became apparent that the stock was being exploited at a rate that was unsustainable.

RECENT ASSESSMENTS

Work in recent years has included a biological assessment project at the Fish Holes on Fish Creek, a tributary of the Rat River where the Dolly Varden overwinter, spawn and rear. This work consisted mainly of non-lethal seine netting on the spawning grounds (to determine actual spawning sites, timing of spawning, fecundity, sex ratios, maturity, age) and tagging (to estimate stock size, growth rates and harvest rates).

Most recently, in 2010, the results were largely the same as in the 2009 year. This indicates that the population is currently composed of one or two age classes (adult fish) which are maturing and will begin to die off in coming years. As these age groups die off, juvenile fish should be maturing and taking their place. So far, it does not appear that there is a juvenile 'pulse' upcoming in the population. This is probably a result of the decreased populations seen from 2004 to 2006 and the population has yet to recover from those year class losses. This indicates that the Rat River char population may be highly cyclical and it may be many years before the population recovers from the mid 2000s population lows.

Highlights of the 2009 survey at Fish Hole were:

- abundance of spawners
- proportion of silvers was down
- 470 fish caught, 462 fish tagged
- overall decrease in juvenile population
- average size fairly stable

Highlights of the 2010 survey at Fish Hole were:

- abundance of spawners
- similar proportion of silvers as in 2009
- few juveniles observed
- overall very similar results to 2009

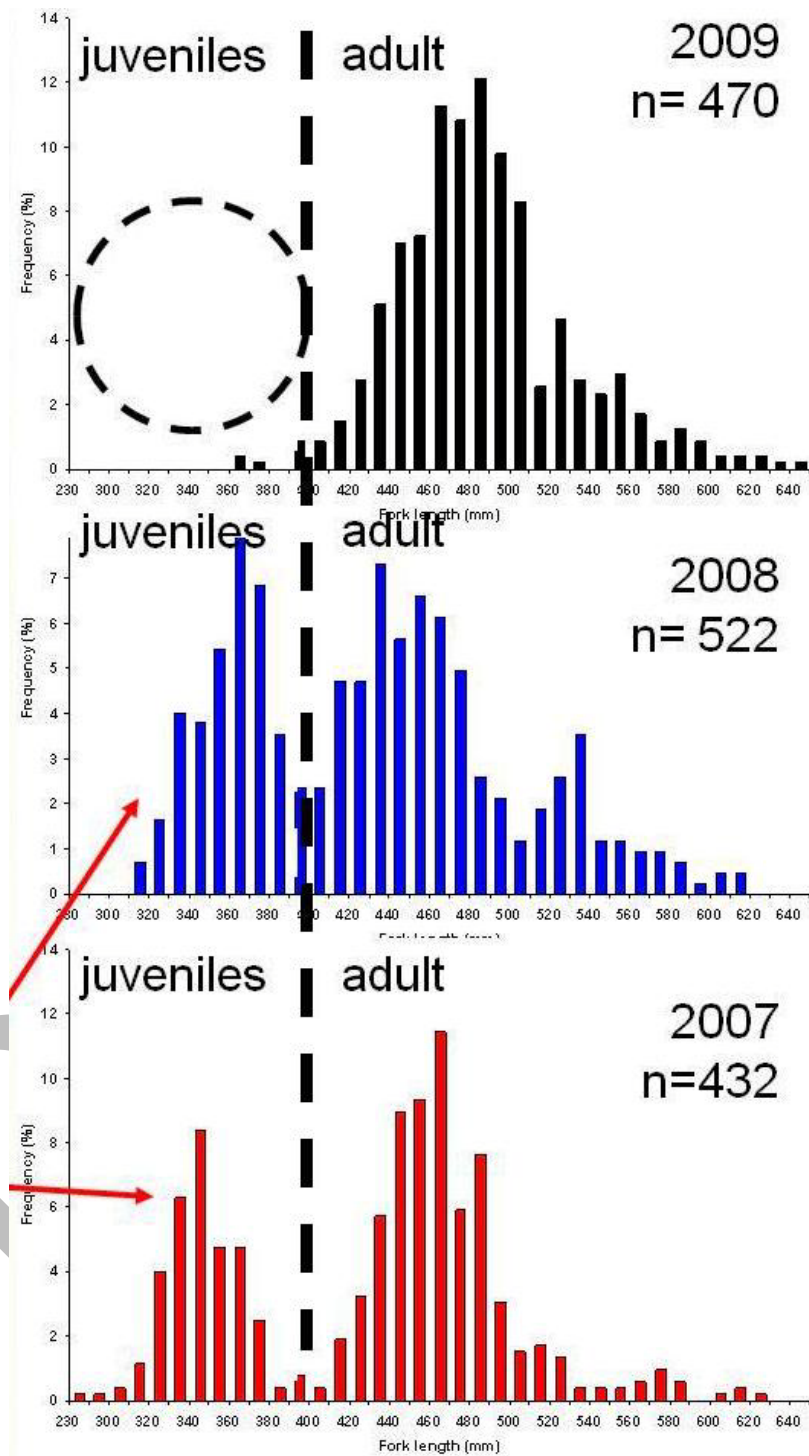


Figure 2. Length-frequency graphs for three years of the Rat River char population (2007-2008-2009). This graph shows the lack of juvenile fish (fish smaller than 400mm – 16”). The lack of juvenile fish indicates that the population may be about to decline.

WHERE DO RAT RIVER CHAR GO?

Tagged Rat River char are typically only captured at the following locations: Shingle Point, Aklavik, Big Eddy, Husky Channel, mouth of the Rat River and Destruction City. Very few tagged fish have been caught at other locations, suggesting that the majority of Rat River char do not go up other streams or mix with other char stocks, except in the ocean (*e.g.*, Shingle Point).

It is very important to return all tags recovered so that it can be determined where Rat River char spend the summer. For the first time, Rat River char and Big Fish River char were tagged in the same year (2009). Knowing where these fish go in the summer and where they are being caught is extremely important to the management of the fishery.

HOW MANY ARE CAUGHT IN THE FISHERY?

In each year between 1973 and 1993, the harvest of Rat River char was estimated to fall within the range from 1600 – 2600 char per year. This includes some catches from the Fish Hole in the early 1970's. A small (*e.g.*, <900 kg) commercial quota was in place up until 1985, under which a small amount of char were sold for commercial purposes. These fish were taken as part of the subsistence fishery, not from a dedicated commercial fishery per se. The total estimated harvest of Rat River char caught per year by all fishermen is shown below in Figure 3. Estimated harvest broken up by user group (Gwich'in and Inuvialuit) from 1995 to 2003 is shown in Figure 4.



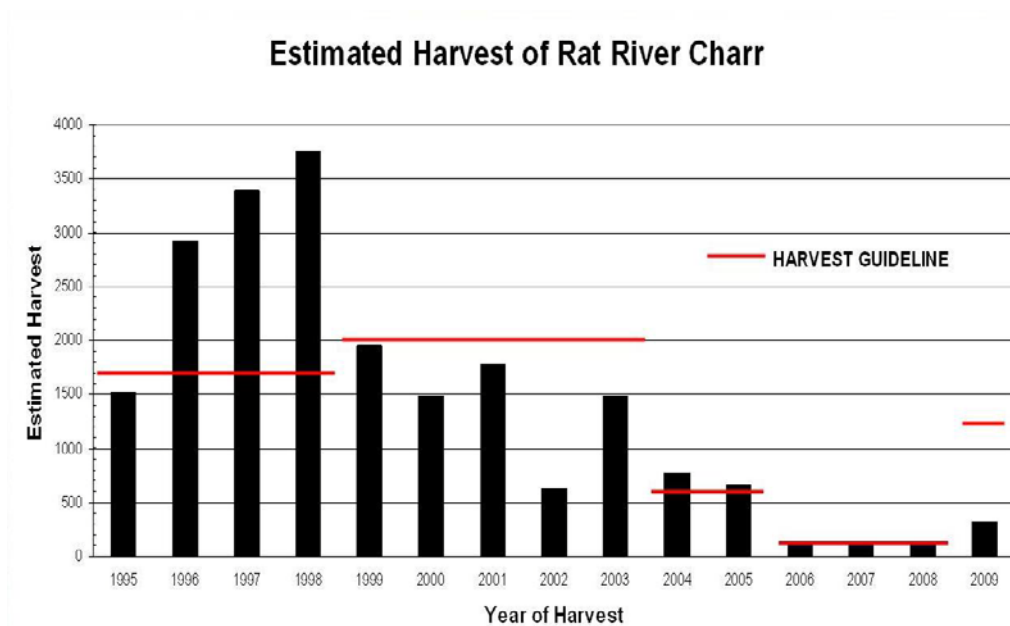
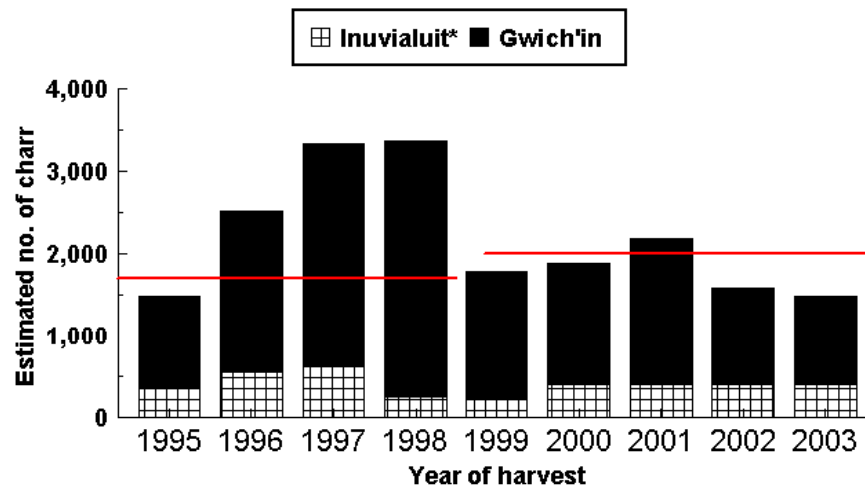


Figure 3. Estimated Rat River char harvest from 1995 to 2009. This indicates that overharvest in 1996, 1997 and 1998 may have contributed to population declines, and as a result lower catches, in 2002-2004.



Estimated harvest of Rat River charr, 1995-2003 (Inuvialuit Harvest Study; Rat River Charr Monitors, DFO 1999 Fish Harvest Study, Gwich'in Harvest Study and preliminary data from the 2003 Rat River monitoring study and GHS)

* data for Inuvialuit harvest of charr at Aklavik for 2000-2003 estimated at 409 per year, which is the mean of the harvest for the previous five years

Figure 4. Estimated harvest of Rat River char from 1995 – 2003 broken up by participant group. This shows that Gwich'in participants have typically harvested higher numbers of Rat River char than Inuvialuit participants.

RECOMMENDED SAFE HARVEST LEVEL

The "safe harvest level" that DFO uses for slower-growing Arctic char (*Salvelinus alpinus*) in the central Arctic is 5% of the population estimate.

The harvest guideline in earlier versions of this plan was 1700 char (1997) and 2000 char (1999 to 2003), which was approximately 15% of the population estimate. This was set by the Working Group during the planning process to meet conservation and subsistence needs. That harvest guideline was exceeded in 1996, 1997 and 1998, by 25-67%, and since that time, the harvest has been at or below the 2000 char guideline because the fishermen were not able to catch more than that.

The combination of a high harvest rate (15% of population estimate), exceeding the recommended harvest level, and factors such as habitat change, predation or others, appear to have had a negative effect on the stock. The changes seen in stock parameters (age and sex ratios) during the period from 2001-2004 provide strong evidence that the stock is not able to withstand removals at 15%.

It is recommended that the present level of harvest stay at 5% of the most recent estimate of stock size, or 600 fish for 2010. In 2009, the stock size estimate was higher due to a large group of mature fish from one year class, and the harvest level was also 5%, which was approximately 1225 fish. In 2009, this harvest level was not met. Reported harvest for 2009 was 491 char. Harvest was not met largely due to poor fishing conditions during the peak of the run.

Given the most recent (2008) estimate of stock size (11,400), the recommended harvest level for the Rat River char stock will remain at 5% or 600 char per year.

Until more information or indicators are available to suggest that the stock is increasing in size, the signatories of this plan agree to a harvest guideline of 5% or less of the population estimate per year for this fishery. To achieve this level of harvest, the signatories of this Plan recommend that all persons fishing for Rat River char follow this recommendation. People should take only what they need for their own subsistence purposes.

Given that it appears Rat River char are sensitive to overharvest, management must rely on a precautionary approach to harvest levels. Having a comprehensive, yearly stock assessment would aid in determining these levels. However, both the Gwich'in and Inuvialuit cultures do not agree with the handling of fish and believe that fish should be treated respectfully at all times. It will be increasingly possible to obtain population estimates without handling the fish as fishery managers learn more about the natural population cycles of Dolly Varden and what influence natural processes have on char populations. Proxies, such as char monitor CPUE, changes in the size or age classes of the char may also be helpful in determining stock size and proper harvest level.

ALLOCATION OF HARVEST

In the event that harvest restrictions are necessary, it is the responsibility of the GRRB, FJMC and DFO, in consultation with and using input from the HTC's and RRC's, to make recommendations as to what the total allowable harvest level would be.

Signatories to this Plan are responsible for reaching an agreement as to how this total

allowable harvest would be divided among the claim areas and the communities.

Finally, it would be the responsibility of the respective RRCs and HTC to divide their own allocation among their own membership.

TYPES OF FISHERIES

Subsistence use: Consistent with the Inuvialuit Final Agreement and Gwich'in Comprehensive Land Claim Agreement, and subject to conservation, the first priority for all fishing under this Plan will be subsistence use.

Other uses: Other fisheries may be considered in the future by the communities, so long as these uses do not compromise the stock and all subsistence needs are met first.

Commercial sale of Rat River char to non-aboriginal persons is currently illegal.

PROTECTION OF THE FISH HOLE

The Fish Hole at Fish Creek will be protected from disturbance or degradation by the Gwich'in co-management Boards in place for this purpose (*e.g.*, RRCs, GRRB, Gwich'in Land and Water Board).

The Rat River Char Fishing Plan Working Group (RRWG) meets at least once per year. The WG should be consulted and involved in the decision process prior to any developments being approved for the Rat River watershed.

Any fishing above Destruction City requires prior permission of the RRCs.



Rat River Fish Holes in fall. GRRB photo.

RECOMMENDED FISHING GEAR AND METHODS

Appendix 1 lists specific regulations that apply to all subsistence, domestic and commercial fishing in the Northwest Territories and therefore apply to the Rat River fishery. RRC's and HTC's are encouraged to set stricter guidelines (by-laws) outlining the following:

- Use 4" or 4.5" mesh nets.
- Nets set specifically for char should be no more than 30 meshes deep.
- There should be no more than three (3) nets set per household.
- Maximum net length should be no more than 25 yards (75 feet). (DFO regulations regarding the setting of nets are shown in the Appendix (1).
- Net check intervals should be twice per day during the entire fishing season (weather permitting) to prevent fish wastage.
- Fishermen remaining at the fishery throughout the season should be given priority in the selection of fishing sites.



Checking nets. GRRB photo.

STORAGE & PROCESSING

- Nets must be checked every 30 hours in the summer months (DFO Regulation; see Appendix 1).
- All catches must be stored and processed so as to eliminate wastage (DFO Regulation; see Appendix 1).

RESEARCH & MONITORING

DFO, FJMC and the GRRB will provide information on the studies that are being conducted to the communities, prior to, during and after any and all projects are completed. The RRCs and HTC will review and approve project proposals before the projects proceed. Local information and expertise will be used in the design, delivery and interpretation of all projects concerning Rat River char.

Persons fishing for Rat River char will provide the char monitors, and the Gwich'in Harvest Study field worker with accurate information about their catches. When requested and practical, persons fishing for Rat River char will make their catches available for measuring and sampling by the char monitors.

Fishermen will return any and all tags recovered from char and also provide DFO or the char monitor with accurate information about when and where any such tagged fish were caught. DFO and the char monitors will ensure that accurate records are kept about all returned tags, and that rewards are distributed promptly.

Local knowledge about Rat River char and their habitats should be obtained through a community knowledge study, and thus be available for present management studies and activities and for future generations.



Radio tracking char. GRRB photo.

LIFE OF THIS PLAN

This eighth version of the plan will be in effect for three years, 2010-2013, after which time it will be reviewed again prior to the fishing season.

The Rat River Working Group will continue to meet annually to review progress and discuss issues/required changes to the Plan.

Appendix 1: Fisheries and Oceans Canada Northwest Territories Fishery Regulations that apply to subsistence fisheries for Rat River char.

- 1) Nets must be checked every 30 hours in the summer (May 16 to October 31) and every 72 hours in the winter (November 1 to May 15).
- 2) At least one third of a stream must be left open to allow fish to pass.
- 3) Indian, Inuk or persons of mixed blood may fish without a license by angling or gillnets, set lines, spears, snares or dip nets, for food for himself or for dogs.
- 4) No person shall fish by snagging.
- 5) No person shall dispose of dead fish or any remains or offal of fish by leaving it in the water or on the ice over the water.
- 6) Fish that is suitable for food shall not be wasted.
- 7) All nets must have the name of the net owner clearly marked.
- 8) Fishery Officers may determine or prescribe the distance between each and every fishery and shall forthwith remove any fishing apparatus or material that the owner neglects or refuses to remove.