ANGLER HARVEST SURVEY
LUBBOCK RIVER SPRING 2010

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Key Findings

- Anglers spent 454 hours of angling effort on Lubbock River over a 5-week period in spring 2010. Each day over the survey saw an average of 12.3 hours spent fishing, much higher than the most recent survey in 2001 but below the high from 1998.
- Angler success (measured by the number of Arctic grayling caught per hour of angling) was near average for other Yukon fisheries surveyed to date and improved over the most recent survey in 2001.
- The fishery has changed significantly since 1998, likely as a result of more restrictive regulations (since 2001) and increased education. There are now more angling parties, but they spend less time fishing, catch fewer fish, and retain a higher percentage of their catch (24%).
- Anglers kept 133 of the 553 Arctic grayling caught. Including both harvest and incidental mortality (death) from live release, the total spring fishing mortality of Arctic grayling was 154 fish, equating to 53 kg.
- Work to assess the Arctic grayling population is under way at Lubbock but the time series is insufficient to make robust conclusions about the sustainability of the harvest at this time. However, the current harvest level appears sustainable.
- Because of potentially high angler harvest on the Lubbock River, we recommend carrying out another angler harvest survey in 5 years and monitoring the fish population regularly.

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Introduction

We conduct angler harvest surveys, also called creel surveys, on a number of Yukon recreational fisheries each year. We use these surveys, together with other fish and fishery-related assessments, to find out if the harvest of fish from the waterbody is sustainable. Environment Yukon tries to conduct angler harvest surveys on key fisheries every 5 years or according to angler patterns and management concerns. The results of the surveys directly contribute to management decisions that make sure fisheries are sustainable over the long term.

The Lubbock River lies in south central Yukon within the traditional territories of the Carcross/Tagish and the Taku River Tlingit First Nations.

The Lubbock River drainage is a headwater to the Yukon River system. It is a small meandering river, rife with beaver activity, approximately 20 km in length, which connects Little Atlin Lake to Atlin Lake. The river, combined with lakes in the system, supports populations of Arctic grayling, northern pike, round whitefish, long nose suckers, lake whitefish, and lake trout. The river is a key spawning area for Arctic grayling and long nose suckers (Environment Yukon internal files).

The river is only easily accessible in one location; a small dirt road leads west off the Atlin Road and crosses the river by bridge just downstream (south) of Little Atlin Lake. Almost all angling pressure occurs at this location.

Lubbock River has been a historically popular spring Arctic grayling fishery. It is one of the first areas in spring where fish are accessible, and the well-known aggregations/migration of spawning Arctic grayling have been the target of fishers for decades. Reports of continual heavy use and potential over harvest of spawning grayling led to the fishery being identified as an area of concern in the late 1990s. In 1998 we conducted the first spring angler harvest survey on Lubbock River. In 2001, new regulations were introduced to address these concerns and to attempt to lower the Arctic grayling harvest from the river. A maximum size limit was implemented, barbless hooks required, and Arctic grayling catch and possession limits were reduced (see Appendix 1 for details). The regulation introduction in spring 2001 was accompanied by an angler harvest survey to both inform anglers of the changes and monitor effectiveness of the new regulations in protecting spawning Arctic grayling.

This 2010 spring angler harvest survey was carried out on Lubbock River to understand the current levels of angler use and harvest and to establish any trends in the fishery. Data gathered will be combined with concurrent Arctic grayling population assessment surveys conducted in the same location on the Lubbock River (Jessup and Millar 2010) to inform management decisions.

The survey allowed us to:

- determine how much time anglers spent fishing (effort);
- understand the fishery's characteristics and patterns of use;
- measure the success rate of anglers;
- compare the level of harvest to how many fish the river can support;
- record biological information on harvested fish;
- provide anglers with information about regulations; and
- establish a fisheries management presence.

Harvest Regulations

Lubbock River has been managed under 'Special Management Water' regulations since 2001/2002 (see Appendix 1 for the regulation history). These regulations were introduced to reduce harvest and protect Arctic grayling spawners. Arctic grayling catch and possession limits were lowered to 2 fish, along with the required release of all grayling longer than 40 cm. Barbless hooks are mandatory to facilitate live release. In 2003/2004, the barbless hook requirement was changed to single-pointed barbless hooks only. Northern pike catch and possession limits are 4 fish, with the required release of all pike longer than 75 cm. Lake trout catch and possession limits are 1 fish, with the required release of all lake trout longer than 65 cm. General catch and possession limits apply to all other species and are listed in the Yukon Fishing Regulations Summary.

Methods

Survey

In 1990 the Yukon Government adopted survey methodology developed by the Ontario Ministry of Natural Resources (Lester and Trippel 1985). A field worker conducts face-to-face interviews with anglers on selected sample days throughout the summer. The worker asks a standard set of questions about the social and biological aspects of the fishery. Data gathered include:

- How much time did anglers spend fishing?
- What fishing methods did anglers use?
- How did anglers fish (boat, shore, etc.)?
- Were anglers guided?
- Where were anglers from?
- What type of visitor were anglers (day users, campers, etc.)?
- What kinds of fish were anglers trying to catch?
- How many fish did anglers catch?
- How many fish did anglers release?

Any other information offered by anglers about their fishing experience is also recorded.

The field worker also collects biological data on the catch of cooperative anglers. Biological data gathered include: length (mm), mass (g), sex, maturity, scales or an otolith (a small bone from the fish's head) for aging, and stomachs for content analysis in the lab. Any other information about general health and condition of the fish is recorded by the field worker (e.g., abnormalities, disease, lesions).

The field worker subjectively assesses the weather's effect on fishing over the entire sample day (no possible adverse effect, possible adverse effect, definite adverse effect).

The timing of the survey depends on management objectives, key species, and the nature of the fishery. The goal is to sample on at least 20% of the total survey days. The survey is subdivided into mornings and afternoons on weekends and weekdays. Each period has its sample days, with a higher weighting for those periods with higher projected angler use and a minimum number of samples for each period.

Sample days are 7 hours long, either morning (0800h – 1500h) or afternoon (1500h – 2200h) periods. On sample days, the field worker interviews all willing anglers. The field worker also records anglers who are observed but not interviewed.

Analysis

When the survey is finished, we enter the data into an Access database and analyze it using standard statistical methods. We determine the age of sampled fish by counting growth rings on the otoliths ("ear bones"). Diet is determined by examining the stomach contents.

2010 Lubbock River Survey

This survey covered the spring spawning activities of Arctic grayling. The survey began on 1 May and ended on 6 June 2010.

We used an access survey method. The field worker was stationed at the bridge crossing of the Lubbock River (Figure 1) for the sample period. The worker interviewed angling parties at the end of their fishing trips. This is the only location where vehicles can readily reach the Lubbock River and where almost all angling activity on the river takes place.

Figure 1. Lubbock River, showing location of 2010 Angler Harvest Survey.

The survey period was divided into 4 time periods: mornings and afternoons on weekends and weekdays. During the 37-day survey period, field workers sampled on 16 half days, giving an overall sampling effort of 22%.

We divided data analysis into 2 parts. In the first part, we combined data across all 4 time periods. In the second part, we compared results between time periods. All data were analyzed at both the angler party level and the individual angler level as appropriate.

Results of the 2010 Survey

Effort

We estimate that 454 hours of angler effort (fishing time) were spent on Lubbock River over the spring 2010 survey period. Altogether, 303 anglers fished on the Lubbock River for an average of 1.5 hours per angler. On average, 12.3 hours of fishing effort were expended each day of the survey.

Fishing Methods

Spin casting was the most popular method of fishing, followed by combinations of methods (spin casting and fly casting), with a small percentage of anglers just fly casting (Table 1).

Table 1. Fishing methods.

Method of Fishing	Percent of Anglers
Still	
Jig	
Drift	
Troll	
Spin Cast	60%
Fly Cast	6%
Other or Combination	34%

Methods of Access

All anglers fished from shore.

Guided Anglers

No guided anglers were observed.

Angler Origin

A majority of anglers were from Whitehorse (Table 2). A few were local (Lubbock River area) and a few were from other Yukon communities (mostly from Tagish and Carcross).

Table 2. Angler origin.

Origin	Percent of Anglers
Local	9%
Whitehorse	69%
Yukon	9%
Canada	3%
U.S.	
Other	
Unknown	10%

Visitor Type

Most anglers were day users, but some camped on crown land at the river (Table 3). A few groups camped at nearby Territorial campgrounds (Snafu and Tarfu lakes).

Table 3. Angler visitor type.

User Type	Percent of Anglers
Day users	69%
Camper – Territorial campground	6%
Camper – Private campground	
Camper – Crown land	25%

Weather

Weather had no adverse effect on most fishing days, but a definite adverse effect was observed on 11% of days (Table 4).

Table 4. Sample day weather.

Did Weather Affect Angling?	Percent of Angler Parties
No possible adverse effect	83%
Possible adverse effect	6%
Definite adverse effect	11%

Catch and Harvest

Arctic grayling were the most heavily caught and harvested species (Table 5). Northern pike were the only other species recorded; there was a low catch and very low harvest.

Table 5. Angler catch and harvest**.**

	# Caught	# Kept	Retention Rate
Arctic grayling	553	133	24%
Northern pike	16	3	19%

Estimated angler catch per unit effort (CPUE, the number of fish per angler hour) over the entire survey can reflect changes in the fishery because it incorporates effort and catch. Dramatic decreases in CPUE for a particular species could indicate problems of health or status. However, relying on CPUE of anglers alone is not recommended (see the section entitled "Invisible Collapse" in *Status of Yukon Fisheries 2010* [Environment Yukon 2010]). Anglers are very good at finding fish even when the population is in decline.

In Lubbock River, Arctic grayling CPUE was only slightly below the Yukon average (1.25) for fisheries surveyed to date (Table 6).

Table 6. Estimated catch per unit of effort (fish/hour).

	CPUE
Arctic grayling	1.22
Northern pike	0.04

Targeted Species

Anglers targeting a particular species were more successful than those who did not (Table 7). Ninety percent of anglers targeted Arctic grayling and they were responsible for all of the grayling catch and harvest. No grayling were incidentally caught by anglers targeting other species. Five percent of anglers specifically targeted northern pike, and those anglers were responsible for 60% of the northern pike catch but none of the harvest. All pike harvest was taken by anglers targeting Arctic grayling.

Table 7. Catch and harvest by anglers targeting specific species.

	Percent of Angler Parties	Percent of Total Catch	Percent of Total Harvest
Arctic grayling	90%	100%	100%
Northern pike	5%	60%	0%

Biological Data

We sampled 23 harvested Arctic grayling for biological data. Mean fork length was 337 mm, mean weight was 397 g, and mean condition factor was 1.04. This condition factor (relationship between length and weight) is average for Arctic grayling in Yukon and indicates healthy fish. The sex ratio was even (1.0 female per male).

Anglers harvested grayling across a range of sizes from 266 to 390 mm (Figure 2), and the most common size harvested was the 325-350 mm class. Age data are available for 17 of the harvested grayling; the average age was 4.7 years, ranging from 3 to 8 years (Figure 3).

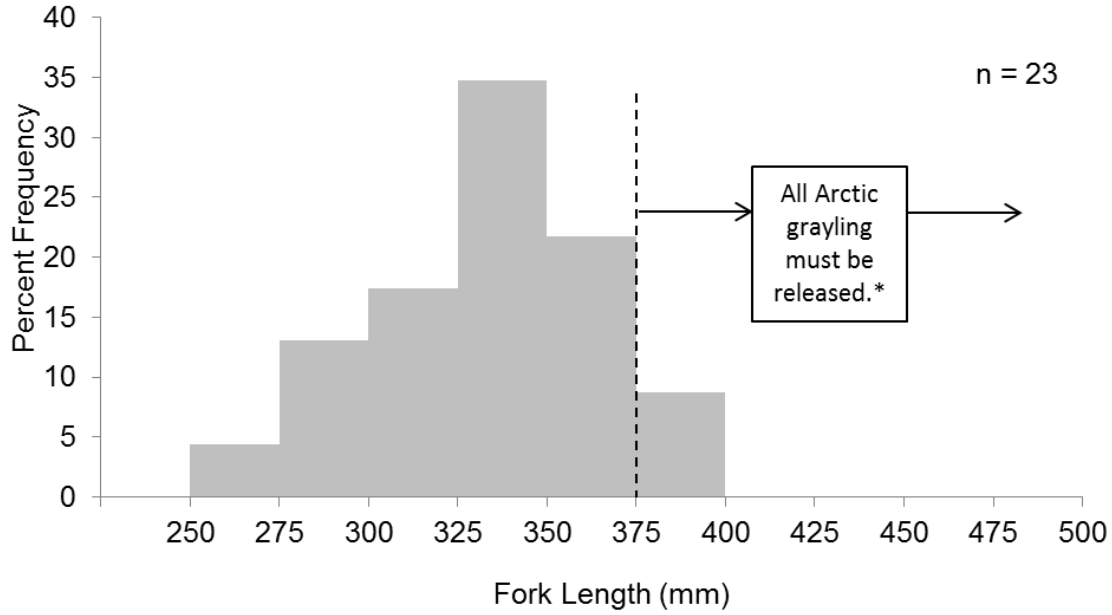

Figure 2. Fork lengths of Arctic grayling harvested by anglers.

*Regulation requires the release of all grayling over 400 mm in total length, equating to 380 mm fork length.

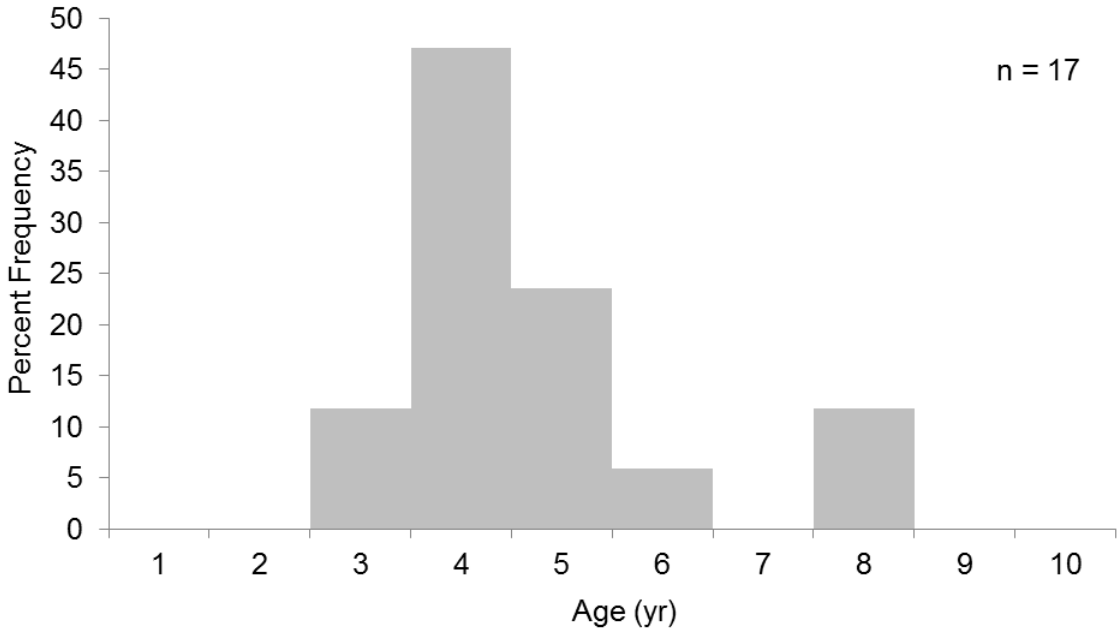

Figure 3. Ages of Arctic grayling harvested by anglers**.**

We analyzed the stomach contents of 17 Arctic grayling, which averaged 86% full. Caddisflies were by far the most common diet item (Table 8).

Table 8. Sampled Arctic grayling stomach contents.

	Percent Volume
Caddisflies	84%
Scuds, sideswimmers	7%
Non-biting midges	5%
Unidentified vegetation	3%
Waterboatmen	1%
Predacious diving beetles	Traces
Leeches	Traces
Water scorpions	Traces
Unidentified fish	Traces
Unknown	Traces

No northern pike were sampled over the survey.

Comparison with Previous Surveys

Angler harvest surveys were previously completed at the Lubbock River in 1998 and 2001. We used a similar and comparable methodology and design for all surveys, but the 1998 and 2001 surveys were longer in duration than the 2010 survey. Both previous surveys were run from April 15 to June 15, a 62-day period, while the 2010 survey was only 37 days in duration, from 1 May to 6 June.

To facilitate comparisons between surveys we use data subsets of 1 May to 6 June from the first 2 surveys as well. When compared to the overall results from these years, the reduced period covers a majority of angler effort at this location: 70% in 1998 and 73% in 2001.

For comparative purposes, the results below, except where indicated, are for the full survey in 2010 and reduced, but equivalent, periods in 1998 and 2001. Full results of the previous surveys are available in survey summary reports (Environment Yukon files).

Effort

Estimated angler effort in the 2010 survey period increased from 2001, but remained lower than the 1998 estimate (Table 9). The number of angling parties was much higher in 2010 than in both previous years, but the 2010 parties expended much less effort per visit.

Table 9. Total estimated angler hours.

	2010	2001	1998
Total hours	454	328	570
Hours per day	12.3	8.9	15.4
Number of parties	163	82	115
Hours per party	2.8	4.0	4.9

Fishing Methods

Fishing methods are split between spin casting and fly casting or combinations of the 2, with spin casting dominant in most years (Table 10).

Table 10. Fishing methods (percent of parties).

	2010	2001	1998
Still			
Jig			4%
Drift			
Troll			
Spin Cast	60%	23%	61%
Fly Cast	6%	37%	21%
Other or Combination	34%	36%	12%
Unknown		4%	1%

Methods of Access

Anglers in all years accessed the fishery entirely from shore.

Guided Anglers

Formally guided parties have never been observed at Lubbock River.

Angler Origin

Whitehorse-origin anglers have been dominant in all years, while 2010 saw a decline in local anglers (Table 11). "Yukon" anglers are primarily from Tagish and Carcross.

Table 11. Origin of anglers (percent of parties).

	2010	2001	1998
Local	9%	17%	20%
Whitehorse	69%	72%	65%
Yukon	9%	4%	6%
Canada	3%	5%	9%
U.S.			
Other	10%	3%	5%
Unknown			7%

Visitor Type

Most anglers in all survey years were day users (Table 12). In 2001, there were fewer campers using Crown land at the bridge crossing.

Table 12. Visitor type (percent of parties).

	2010	2001	1998
Day Users	69%	97%	73%
Camper – Territorial campground	6%		
Camper – Private campground			
Camper – Crown land	25%	3%	24%
Unknown			3%

Weather

The field worker's subjective assessment of weather effects on angling activity indicates that most days were good for fishing in all survey years (Table 13). There were some days with definite adverse effects in 2010, but fewer than in 2001.

Table 13. Weather effects on angling activity (percent of parties).

	2010	2001	1998
No possible adverse effect	83%	64%	87%
Possible adverse effect	6%	14%	13%
Definite adverse effect	11%	21%	0%

Catch and Harvest

The catch of Arctic grayling in 2010 increased from 2001 (Table 14), but was still only about half of the catch recorded in 1998. Because the retention rate in 2010 was the highest of all surveys at 24% the 2010 harvest was equal to the 1998 harvest of just over 130 fish.

Catches of other species were largely incidental and highly variable between surveys, although there was an observed increase in northern pike catch in 2010. Whether this relates to increasing abundance of pike in the system, or just changing patterns of use by fish (largely dictated by lack of beaver activity in the upstream river reach) remains to be seen. This should be monitored in future surveys.

Table 14. Estimated number of fish caught, fish kept and the retention rate.

		2010	2001	1998
Arctic grayling	Caught	553	290	1,043
	Kept	133	51	134
	Released	420	239	909
	% Kept	24%	18%	13%
Northern pike	Caught	16		7
	Kept	3		4
	Released	13		
	% Kept	19%		57%
Longnose sucker	Caught		4	
	Kept		0	
	Released		4	
	% Kept		0%	

Estimated CPUE (number of fish per angler hour) over the entire survey can reflect changes in the fishery because it incorporates effort and catch. Dramatic decreases in CPUE for a particular species could indicate problems in terms of the health or status of the fish species in question.

However, relying on CPUE of anglers alone is not recommended – see the section entitled "Invisible Collapse" in the *Status of Yukon Fisheries 2010* (Environment Yukon, 2010) – anglers are very good at finding fish even when the population is in decline.

In the Lubbock River, Arctic grayling CPUE declined steeply from 1998 to 2001, then increased in 2010 (Table 15). Arctic grayling CPUE on Lubbock River is currently just below the Yukon average (1.25) for fisheries surveyed to date.

We are uncertain as to why CPUE has fluctuated in this manner. It is possible that 2001 was a poor year for the Lubbock River grayling population, but given that there was high success and harvest in 1998 (and anecdotally in other years leading up to regulation changes in 2001) it is possible that the stock was slowly being depleted through the late 1990s and there were fewer fish present in 2001, the first year of increased regulatory protection. The increased success rate observed in 2010 could be an early sign of population recovery under this scenario. This is supported by the fact that the average age of grayling in this fishery is about 5 years, so we could be seeing the first of the second generation of fish following increased protection. Alternatively, variation in the success of anglers may be related to other unmeasured factors in the environment or in the group of anglers themselves.

Table 15. Estimated catch per unit of effort (fish/hour).

	2010	2001	1998
Arctic grayling	1.22	0.88	1.83
Northern pike	0.04		0.01
Longnose sucker		0.01	

CPUE for species other than grayling are very low and catches were incidental.

Fishery Sustainability

Changes in the fishery

In response to a conservation concern, changes to fishing regulations were introduced prior to the beginning of the 2001 spring fishery (i.e., the 2001/2002 season). These changes reduced the catch and possession limits from 5 to 2 and 10 to 2, respectively, and established a 40 cm maximum size limit for Arctic grayling.

The intent of the change was to reduce harvest and increase the percentage of fish released either through regulatory compliance or voluntary release of fish by anglers.

It appears that the greatest impact of these restrictions has been to reduce the amount of fishing effort. Spring fishing effort dropped from 570 hours in 1998 to 328 hours in 2001 (Table 10), the first year of the regulation change. This seems to have had lasting effects and 10 years later the effort is still lower (454 hours). We suspect the changes in effort are from both an increased awareness of the conservation concern and because reduced catch and possession limits made the fishery less desirable for some anglers.

We believe that the results of the 2001 survey, when viewed in the context of previous surveys, signal a change in angler behavior. The more restrictive regulations put in place in 2001, in combination with education around the value of spawning fish and the need to respect fish at these critical life history periods, has likely led to reducing the amount of live release angling which was more heavily practiced in previous years.

This idea is supported by several trends. First, the retention rate has increased over each survey from 13% in 1998 to 24% in 2010 (Table 15). Second, the average angling party spent less time fishing in 2001 (4.0 hours) than in 1998 (4.9 hours) and much less time fishing in 2010 (2.8 hours) (Table 10). Third, angling parties on average caught many fewer fish in the 2 most recent surveys, 3.3 in 2010 and 3.5 in 2001, compared to 9.1 fish per party in 1998. The reduction in number of fish caught is not simply a reflection of poorer quality fishing, which although lower in 2001, increased in 2010 (Table 16). Lastly, this change has not come at the expense of angler participation. There was a drop in the number of parties from 1998 to 2001, 115 to 82, but participation increased to 163 parties in 2010 (Table 10).

Many anglers come to the Lubbock River to catch and keep a fresh fish or 2 as a 'rite of spring'. These surveys have shown a change in the behaviour of anglers from a time when a fishing party would spend 5 hours fishing, catch 9 fish and only keep one to where a fishing party spends 3 hours, catches 4 fish and still only keeps one. Through these changes, the fishing quality has been maintained, the number of anglers has increased, and access to the resource has been maintained.

Sustainability

For lake fisheries we assess the sustainability of the fishery by comparing total harvest to an independent estimate of productivity derived from the lake's physical and chemical makeup. But these productivity estimates typically used for lakes are not applicable to river fisheries. Arctic grayling in the Lubbock River use different areas of the river for spawning, feeding, and rearing and are thought to mostly over winter in nearby lakes. The use of a variety of habitats in both still and moving water makes productivity estimation difficult.

Given the uncertainty around productivity, we are investigating ways to assess the health of this population so that we can monitor it through time – thereby giving us an alternate way of establishing the sustainability of the fishery. We have begun to develop a monitoring program to determine Arctic grayling abundance and density in specific stream reaches at specific times (Jessup and Millar 2010).

In spring 2010 we used snorkel survey counts of ~250 m of the most heavily fished portion of the Lubbock River. From this we estimated a peak instantaneous population of adult grayling of 196 fish on 20 May. This number declined into early June with 85 fish estimated on 3 June. Tagging data suggest that there is considerable turnover of fish from week to week in the reach of the river where we surveyed, as few tagged grayling from the previous weeks were ever seen.

Some of the grayling spawn in the study area while others are presumably moving through to other spawning areas downstream (or upstream); the proportions are unknown. Peak of spawning, back calculated from fry emergence, was estimated to have been between 8 and 17 May. Following spawning, a portion of adult fish may have moved out of the spawning areas to summering habitat elsewhere.

Anglers harvested 133 Arctic grayling from Lubbock River over the 5-week spring 2010 survey period (Table 17). Total fish mortality (death) includes the unintentional mortality of any released fish. Live release, when done properly, has a minimal impact. Survival rates for Arctic grayling caught on barbless hooks have been reported to be about 95% (YFWMB 1998). Using this value, for the 420 Arctic grayling released, 21 additional fish died, for a total spring mortality of 154 fish. Based on the average size of sampled fish, the total amount of Arctic grayling mortality in the 2010 spring recreational fishery was 53 kg.

The exact impact of the recreational fishery on Arctic grayling in Lubbock River remains difficult to establish. Most angling effort takes place on approximately 750 m of river channel, but relating this channel length to a population number is difficult and premature at this time. Given peak instantaneous population estimates of about 200 fish per 250 m of stream in the surveyed area, and assuming similar abundance in the unsurveyed areas, we can roughly estimate a maximum instantaneous population of 600 fish in the section of river that is fished. This number drops to less than 300 by the first part of June. Therefore the spring 2010 fishing mortality estimate of 154 fish represents a maximum of 26 to 51% of the local population, but given the turnover of fish observed from week to week, the actual proportion harvested is likely lower. At this time we cannot provide any further certainty around these estimates and caution should be exercised in interpretation as data are very preliminary.

The increase in CPUE in 2010 (Table 16) suggests there are more fish in the creek than a decade ago (but fewer than in 1998). If we assume that the 2001 and 2010 harvests are representative of the intervening years, then we might suggest that a harvest of 100 – 150 grayling from the Lubbock River can be sustained. Given the decline in angler CPUE between1998 and 2001, we might conclude that a harvest greater than 200 grayling is not sustainable in the long term. Again, these observations are based on a limited number of data points.

Table 16. Estimated spring Arctic grayling harvest by anglers. (Bracketed values are the full survey results from the longer surveys conducted in those years.).

	2010	**2001**	**1998**
Arctic grayling harvested	133	51 (96)	134 (196)
Number released	420	239 (373)	909 (1,170)
Catch and release mortality (5%)	21	12 (19)	46 (59)
Total mortality	154	63 (115)	180 (255)
Mean weight (kg)	0.397	0.391*	0.385
Weight of total mortality (kg)	53	25 (45)	69 (98)

* Mean weight unavailable from 2001, an average of all years is used.

Given the difficulty in assessing the sustainability of current levels of harvest, and the continued importance of this, we recommend continued fish population assessment monitoring and another angler harvest survey within 5 years to monitor trends.

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Appendix 1. Lubbock River angling regulation changes 1989 to 2010.

Year	Species	Catch limit	Possession limit	Size restrictions
1989/90*	Arctic grayling	5	10	none
	Northern pike	5	10	none
	Lake trout	3	6	Only one fish over 80cm
1991/92	Arctic grayling	5	10	Only one fish over 40cm
	Northern pike	5	10	Only one fish over 75cm
	Lake trout	3	6	Only one fish over 65cm
2001/02	Barbless hooks only			
	Arctic grayling	2	2	No fish over 40cm
	Northern pike	5	10	Only one fish over 75cm
	Lake trout	3	6	Only one fish over 65cm
2002/03	Arctic grayling	2	2	No fish over 40cm
	Northern pike	4	4	Release all fish between 75 and 105cm, only one fish over 105cm
	Lake trout	2	2	Release all fish between 65 and 100cm, only one fish over 100cm
2003/04	Single-pointed barbless hooks only			
2004/05	Arctic grayling	2	2	No fish over 40cm
	Northern pike	4	4	No fish over 75cm
	Lake trout	1	1	No fish over 65cm

* Yukon Government obtained responsibility for freshwater fisheries management from the federal government in 1989.

Appendix 2. 2010 Results: Comparisons between periods

Effort

Mean daily angler effort was a mixed bag at Lubbock River (Figure 2.1). As expected, weekend afternoons showed the highest daily effort, but there was a moderate amount of effort expended on weekday mornings. Mornings were from 0800 to 1500, and afternoons were 1500-2200.

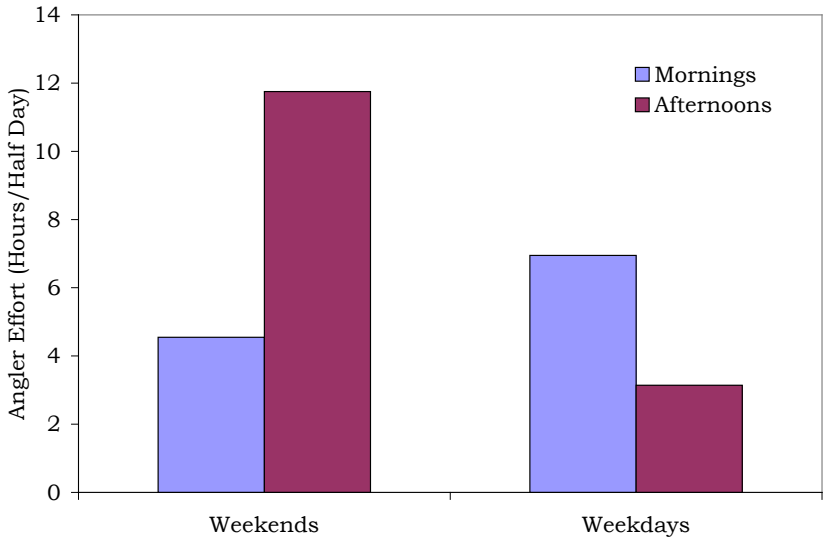

Figure 2.1. Estimated angler effort per half day.

Visitor Type

Day users were consistent through the entire survey period, while campers, Crown land and Territorial campground, were most prevalent on weekends.

Catch

Arctic grayling CPUE mirrored effort, and was highest on weekend afternoons and lowest on weekday afternoons (Table 2.1). Northern pike were fished for on weekend afternoons and weekday mornings, but only caught on weekend afternoons.

Table 2.1. Estimated catch per unit of effort (fish/hour) by period.

	Arctic grayling	Northern pike
Weekend mornings	0.24	
Weekend afternoons	0.43	0.04
Weekday mornings	0.36	0.00
Weekday afternoons	0.20	