Report 3 Section II
Belly River Mgmt Area

The Director, BSFW August 31, 1961

Regional Director, BSFW, Region I

Glacier National Park Fishery Management Review Report No. 3: Section II of A Review of Fishery Data obtained from Waters of Many Glacier Sub-district (A) of the Hudson Bay (East Slope) District of Glacier National Park. (1-FMS)

Transmitted herewith are three copies of the subject report for the files of the Branch of Fishery Management Services, to be attached to Section I which was transmitted from this office on August 17, 1961.

Encl. 3

Original and 1 copy to W. M. M. work file.
1 " " Z. E. P. Report file.
2 " " Glacier National Park
3 " " Central Office
1 " " Canadian Fish and Game
1 " " Montana Fish and Game
1 " " Walt Allen

September 1, 1961

(1-FMS)

Mr. Edward A. Hummel, Superintendent
Glacier National Park
West Glacier, Montana

Attn: Mr. Dave Cannavina

Dear Sir

Enclosed for your files are two copies of the final draft of our Fishery Management Review Report No. 3 on the Belly River Management Area. The third section of this report on the Many Glacier Management Area will probably be completed by the latter part of September.

Sincerely yours,

Wm. M. Morton
Fishery Management Biologist

Wmorton:smb

SECTION II - THE BELLY RIVER MANAGEMENT AREA

GENERAL DESCRIPTION

The Belly River Area contains all of the headwaters of the Belly River Drainage System as well as the headwaters of Lee Creek and Otatso Creek, which are part of the St. Mary River Drainage System (Fig. 2 and Table 4). The Belly River joins the Waterton River near Standoff, Alberta, and both the Waterton and St. Mary Rivers are tributaries of the Oldman River of Canada. The major part of all of these combined drainages is in Canada. After the Belly River leaves Glacier National Park, it flows just inside the eastern border of Waterton Lakes National Park in Canada.

As in the Waterton Area, the few log cabins at the centrally-located Belly River Ranger Station, (Fig. 2), represents the only human habitation or "settlement" in the entire area. This area covers 102,442 acres of very rugged terrain in the western and southern parts, with less rugged open slopes in the northeastern part.

Fishing is generally poor in the streams, and fair to excellent in the lakes. In recent years Elizabeth Lake has produced some of the best fishing in Glacier National Park. Less than one-third of the anglers are Canadians in this area. Kinnie (1960:13) summarized the area thus, "This area has the finest fishing in the park. It is also the most difficult to reach and one of the most primitive."

ACCESSIBILITY

In contrast to the Waterton Area, which has no roads at all, the Belly River Area has a few. About four miles of the Chief Mountain International Highway (Montana 17) crosses the upper northeast corner of the area to Chief Mountain Custom Station on the Border. A wagon trail takes off from this highway as it reaches Belly River in Canada about 2-1/2 miles north of Chief Mountain. This wagon trail follows the river upstream for about 8 miles to the Belly River Ranger Station. A short wagon trail cuts off from the highway in Glacier Park and ties into this wagon trail below the border.

The Ranger Station and waters of the Belly River may also be reached by trails: 1) from Canada via the North Fork; 2) from the Waterton Area via Stoney Indian Pass along Glenns and Crossley Lakes; 3) from the Many Glaciers Area via Ptarmigan Tunnel or Redgap Pass along Elizabeth Lake; 4) from the Lake McDonald Area via Ahern Pass along Helen Lake and, 5) from a wagon trail into Otatso Creek via the Slide Lake trail.

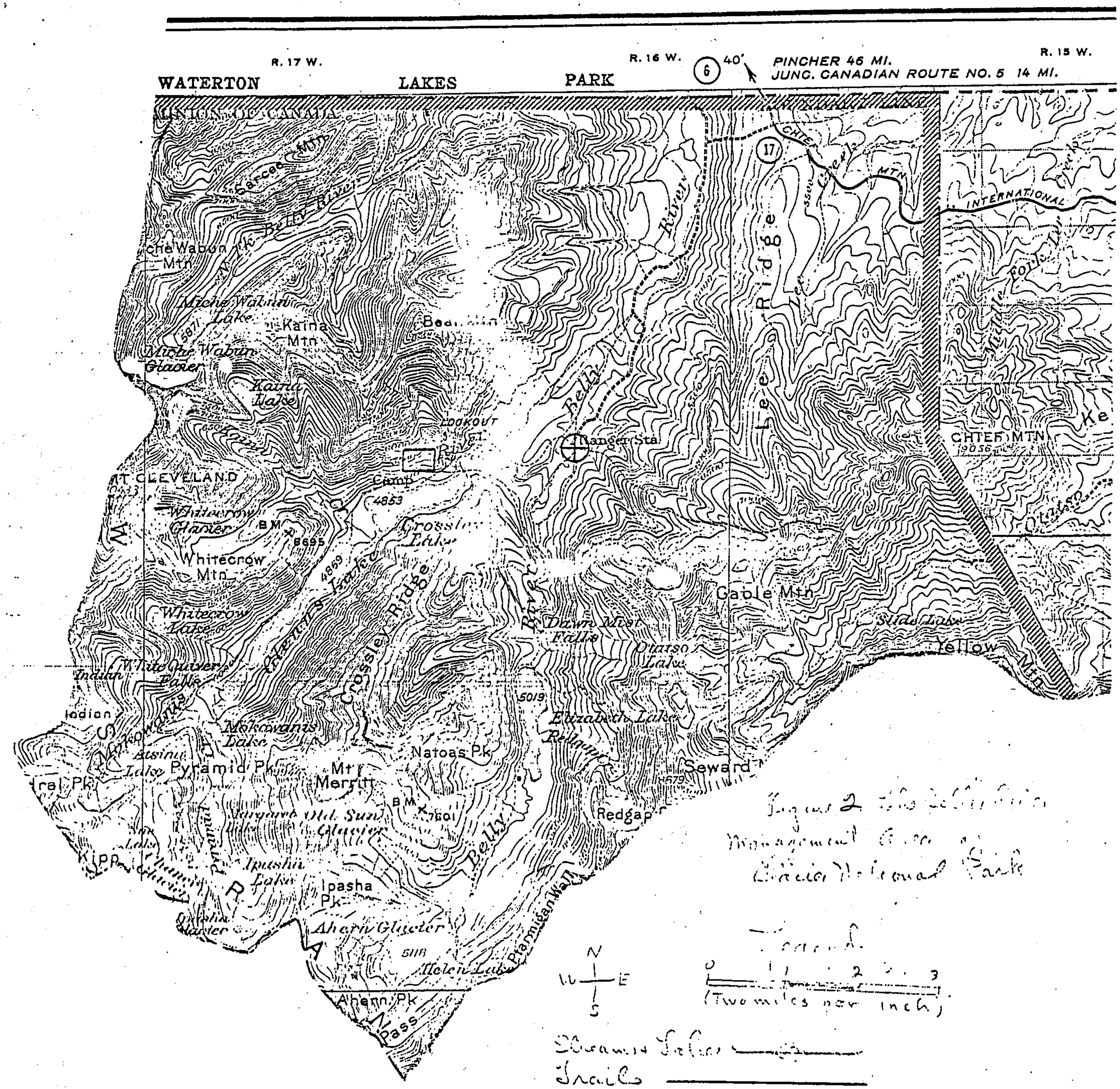


Figure 2 The Belly River Management Area of Glacier National Park

Legend

Streams & Lakes
Trails
Dirt Roads
Hard Top Roads
impassable falls

Legend:

LAKES:-
A-Est. Surface Acres
B- " . Miles Shoreline
C- " . Maximum Depth.

STREAMS:-
A- Total Miles
B- Est. of Fishable Miles
C- Est. Avge width in Feet

FISHING Data:-
A- Est. No. Man-days in 1960
B- " Quality Index
C- Sport Species Present

	LAKES A	LAKES B	LAKES C	Elevation	STREAMS A	STREAMS B	STREAMS C	FISHING DATA A	FISHING DATA B	FISHING DATA C	Comments:
II-BELLY RIVER DRAINAGE											
A-North Fork of the B.R.				5500	4	2		10	(P)	EB CT Gr Rb DV Wh	Census + survey
1. Unnamed Trib. and Lake	10	0.4		6850	2	0	5-	0		none	Inaccessible
2. " " (2) on RB				5800	1	0	-5-	0		"	steep; "
3. Miche Waben Lake	80	1.5		5870	3.5	1	8	0		"	" "
B. Mainstem of the B.R.				4600	7	7	100	50	P	EB CT Gr Rb DV Wh	Census + survey
1. Unnamed Trib. LB. (2 to 3.5 mi long) (4)				5500	12	4	8	0		?	survey
2. " " RB. (4) 1.5 to 4.0 mi. long				5000	10	0.5	-5	0		?	"
C. Middle Fork (Mokowanis River)				4800	8	3.5	40	35	VG	EB Wh Gr LT DV Su	Census and survey
1. Unnamed Trib (2)				6000	3.5	0		0		none	too small + steep
2. Crossley Lake	240	3.5		4850				125	F	CT LT Rb Wh	Census + survey
3. Kaina Creek				5300	3	0.5	10	0		none	too steep + cold
a. Unnamed Trib (2) LB Kaina Mt. RB Whitecrow Lk.				4500	2	0	-5	0		"	
				5500	2	1.5	5	0		"	too cold
b. Kaina Lake	40	0.7		6950				0		"	" " + small
4. Glenns Lake	320	5.5		4870				250	P	LT; Wh.	Census + survey
a. Whitecrow Cr. and Lake	20	0.5		6250	1.2	0	5	0		none	too small; steep
b. Pyramid Cr.				5300	4.0	0.5	20	0		?	very steep
a.a. Mokowanis (Lois) L.	48	0.8		5050				150	VG	EB	census + survey
bb Margaret L.	80	1.8		5450				0		?	
cc Spasha L.	60	1.0		5650				0		?	
dd. Unnamed L.	15	0.5		7350				0		none	
5. Upper Mokowanis River				5250	3	1	15	?	?	EB	census + survey
a. Unnamed Trib LB				5800	1.5	0	-5	0		none	too steep
b. Atsina (Middle) Lake	15	0.4		5750				0		EB	census + survey
c. Unnamed Trib + Lake	10	0.2		7000	1.1	0	5	0		none	too small + steep
d. Sue Lake + Trib	85	1.3		7050	0.5	0	8	0		"	Inaccessible
D. South Fork of the B.R.				5000	8	5	30	0		?	census + survey
1. Unnamed Trib (2) LB				6000	3	0	-5 10	0		none	too steep
2. " " (2) RB				6000	2	0	-5	0		"	" "
3. Elizabeth Lake	240	3.8		5020				750	Supm	Rb, Gr. EB	census + survey
a. Redgap Cr. and Lake	12	0.4		6650	2	0	8	0		none	too small + cold
4. Unnamed Trib (3) LB				5500	5.7	0	a) -5 b) 10	0		?	census + survey
5. Helen Lake	190	2.3		5120				0		?	" " "
a. Unnamed Trib (4)					3.0	0	-5	0		none	too steep
b. " Lakes (2)	10	0.3		5450				0		"	too small + cold
	15	0.4		5550							
III-St. MARY RIVER DRAINAGE											
A. Lee Creek				5800	6	0	20	0		?	census + survey
B. Otatso Creek (N. Fk Kennedy Cr.)				6000	5	3.5	20	0		?	" "
1. Slide Lake	25	0.8		6050				150	P	Ct DV Rb Br	" "
2. Unnamed Trib 3 on LB				6500	3.5	0.5	5	0		none	too steep + small
3. " " 1 on RB				6700	1.5	0.8	8	0		?	survey
a. Unnamed ponds (2)	5+10	0.3		6700				0			Too small
				7000				0			
4. Unnamed ponds (2)	5+5	0.3		6500				0			" "
5. " " (1)	20	0.5		6750				0			Inaccessible
6. Otatso Lake	35	0.7		6850				0			survey

REVIEW OF THE INDIVIDUAL WATERS OF THE BELLY RIVER DRAINAGE

Within the borders of Glacier National Park, the Belly River Drainage System has four rather distinct water areas which are discussed in this report in the following order:

A. The North Fork waters
B. The main stem of the River from the forks downstream to the Canadian border
C. The Mokowanis River (formerly referred to as the Middle Fork) and its lakes
D. The South Fork and its lakes

Detailed descriptions of the various waters and all of the known information on fish and fishing in them are presented below in a clockwise or more or less north to south order.

A. North Fork of Belly River: The North Fork has its source in Miche Wabun Lake and flows northeast for about 4 miles to the border and empties into the Belly River in Canada. The lower two miles of the stream are accessible to fishermen who hike in over a trail from the Belly River Wagon Road, which joins a trail that extends from the mouth of the river in Canada for about six miles upstream to the mouth of the largest tributary (A-2) in Glacier National Park. Brooks (1921) stated this stream had cutthroat and other varieties of native fish. Schultz (1941) did not visit this area. The Canadian fishing regulations list the following species present - grayling, Dolly varden, rainbow, cutthroat and whitefish. There are no records of any fish ever having been stocked in the North Fork of Belly River in Glacier National Park.

A-1. An Unnamed Tributary about 2 miles long (in the park) drains an Unnamed Lake of about 10 surface acres and empties into the North Fork of Belly River in Canada. No access - no fish.

A-2. Two Unnamed Tributaries enter the right bank of the North Fork. The small (1 mile long) one is very steep, and judging from the topographic map there must be some steep falls in the North Fork near its mouth. The larger tributary (3.5 miles long) has a much lower gradient, as has the main stem of the North Fork above the falls area mentioned above. No access - no fish.

A-3. Miche Wabun Lake of about 80 surface acres and 1-1/2 miles of shoreline at 5,870 foot elevation is a primitive lake which has never been stocked. It is inaccessible by trail, at a high elevation, and nothing is known of its aquatic life.

B. Main stem of the Belly River: As can be seen from Figure 2, a good trail and a dirt road or wagon trail parallel the lower river for about 6 miles below the International Boundary Line; a second trail starts from the ranger station and parallels the upper river for nine miles past Dawn Mist Falls, Elizabeth Lake, and Helen Lake to its source in Ahern Glacier; a third trail starts from the ranger station and follows the Mokowanis River past Crossley, Glenns, and Atsina Lakes before crossing Stoney Indian Pass into the Waterton Area.

Regarding the fishing, Brooks (1921) said the Belly River had black-spotted trout (cutthroat), whitefish (peno) and no doubt other varieties of native species. A Glacier National Park Circular (1931:27) states, "rainbow and cutthroat trout are plentiful in the Belly River proper." Schultz (1941:33) reports the long-nose dace (Rhinichthys cataractae) was taken in the Belly River although it does not appear in his Table 3 on p. 40. Kinne (1960:13) states, "The Belly River has generally good rainbow fishing from the Canadian Border to about a mile downstream from the Belly River Ranger Station. The Belly River has poor fishing from about a mile below the Belly River Ranger Station to 1/2 mile below Dawn Mist Falls. From this point to about 1/2 mile above Elizabeth Lake, the Belly River has good to excellent rainbow and grayling fishing. There is very poor fishing from a mile above Elizabeth Lake to Helen Lake."

These are the only references we have found to date on fish and fishing in the main stem of the Belly River.

Park Service Records indicate that the following fish have been stocked in the Belly River:

1920	45,000	Rb	
1922	97,000	Ct	Eggs
1927	375,000	Gr	
1936	236,800	Ct	1"
1937	46,400	Ct	1"
1938	40,640	Ct	1"

Ranger Fitzgerald estimated there may have been about 50 man-days of fishing effort spent on the Belly River in 1960. The following creel census was reported from the Belly River in 1959-1960:

The Belly River

Census Dates	Home State	No. in Party	Hours Fishd	No Fish	Spec.	Size Distribution of Catch 4-6	7-9	10-12	13-15	16-18	19+	Total Catch	Comments
7/18/59	-	2	9	1	Rb	1	1	at Bacon Mud Falls				2	with flies and spoons
					DV						1(20")	1	worms and spoons
7/23/59	-	2	4	1	EB	1						1	" " "
8/8/59	-	1	2	0	EB	1	1					2	" " flies
8/9/59	-	2	3	2									
7/2/60	Mont.	3	12	1	Ct			2				2	spinner and spoon
7/8/60	Mich.	2	1	1	DV						1	1	worms. "Need more
					Wh			2				2	good fishing areas."
7/23/60	Md.	4	24	0	Rb		3	1	2			15	Super duper and flies
					Gr					1		1	
8/16/60	Calif	1	1	0	Gr			1				1	Gray Hackle
		17	56	6	Rb	10	4	1	2			17	Ave. Length 9.0"
7 days censused				(35 d)	Ct			2				2	Ave Hrs./Day 3.3
					DV						2	2	Ave. Catch/Hr. 0.50
					EB	2	1					3	Ave. Catch/Day 1.65
					Gr			1		1		2	Quality Index = 15.1
					Wh			2				2	(Poor)
						12	5	6	2	1	2	28	

The average number of hours fished per day was 3.3, the average catch per angler-hour was 0.50 fish, and the average catch per angler-day was 1.65 fish. The quality index (9.0 x 1.68 equals 15.1) was poor.

From the above meager creel census it would appear that a large percentage of the anglers were American tourists. All six species of fish credited as being present in Belly River Drainage by the Canadian Park Service were reported by anglers in the 1959-1960 census records. One out of every three anglers censused caught no fish (which is poor). The average catch per angler day of 1.65 fish averaging 9 inches long gives a very low quality index of 15 which is poor. All these indices of poor fishing are further borne out by the ranger's estimate of only 50 man-days of fishing effort on the Belly River in 1960. It is not known what portion of the river the census came from, but it is assumed that it was derived from the general vicinity of the ranger station.

B-1. Four Unnamed Tributaries along the left bank of the Belly River are accessible by trail. They range in length from 2 to 3.5 miles and all of them may be fishable in their lower reaches where the gradient is low. These lower stretches should be surveyed and their fishery potentials evaluated.

B-2. Four Unnamed Tributaries along the right bank just below the ranger station appear from the map to be too short and steep to contain any fishable waters.

C. The Middle Fork of the Belly River or Mokowanis River: The Mokowanis River (and its lakes) is about 12 miles long and was called Middle Fork of Belly River by Brooks (1921) who stated it contained native cutthroat and whitefish (peno). A Glacier National Park circular (1931:27) and Schultz (1941:40) refer to this stream as the Middle Fork, and more recent publications and maps refer to it as the Mokowanis River. In its lower mile it flows through a narrow valley. Gros Ventre Falls at the head of this narrow stretch form an impassable barrier to upstream migrating fish from the Belly River (fig. 2). Crossley Lake lies about 1/2 mile above the falls and there is about 1/2 mile of river between Crossley and Glenns Lake. The Stoney Indian Pass Trail from the Waterton Area enters the Mokowanis Valley at its headwaters above a tiny glacial lake, and parallels the river and its lakes to the ranger station eight miles below.

Regarding its fish and fishing - Holloway (1945:15) took 4 rainbow trout from the Mokowanis River that were 2 years of age and averaged 199 mm. in length and 74 grams in weight. Schultz (1941:40) reports Salmo clarki, Salmo gairdneri and Prosopium williamsoni as the only known species found in the Middle Fork. Kinne (1960:14) says, "Good to excellent fishing from Gros Ventre Falls to the Belly River; between Glenns and Crossley Lakes; and below White Quiver Falls to Glenns Lake. Rest of the river has poor fishing for cutthroat, rainbow, and eastern brooks."

The following meager creel census results were obtained in 1959 and 1960:

The Middle Fork or Mokowanis River

Census Date	Home State	No. in Party	Hours Fishd	No Fish	Spec.	Size Distribution of Catch 4-6	7-9	10-12	13-15	16-18	19+	Total Catch	Comments	
6/24/59	-	1	4	0	Wh.		2	5				7		
7/7/59	-	1	4	0	LT						1(20")	1		
8/5/59	-	2	10	0	EB	4	3	1	5			13		
8/5/60	Calif.	1	3	0	EB	1	1	1				3		
					DV	1	2	1				4		
					Gr			1				1		
					Su			1				1		
4 days Consumed		5	21	0	EB	5	4	2	5			16	Ave Length	9.8"
					DV	1	2	1				4	Ave Hrs/Day	4.2
					LT						1	1	Ave. Catch/Hr	1.43
					Gr			1				1	Ave. Catch/Day	6.
					Wh		2	5				7	Qual. Index	59
					Su			1				1		(Good)
						6	8	10	5	-	1	30		

A total of only 5 anglers censused had fished 21 hours (4.2 hours per day) to catch 30 lake trout, eastern brook, Dolly Varden, grayling, whitefish and suckers (avg. of 1.43 fish per hr. or 6 fish per day) which averaged 9.8 inches long. This gives a quality index of 59 which would be considered very good fishing if based on a larger sample of anglers. No unsuccessful anglers were recorded which also indicates good fishing.

On the basis of the creel census volunteered, it is estimated that perhaps 35 man-days of fishing may have taken place in the Mokowanis River in 1960. More creel census and fishery survey information are needed from this river before any intelligent management recommendations can be offered.

C-1. Two Unnamed Tributaries enter the Mokowanis River below Crossley Lake are too steep and too small to support fish life.

C-2. Crossley Lake: This 240-acre lake with 3.5 miles of shoreline at 4,850-foot elevation was the fourth in line of fishing intensity in the Belly River Area in 1960. Ranger Fitzpatrick estimated 125 man-days of effort were spent at Crossley Lake in 1960. Brooks (1921) states it had Mackinaw (lake trout), Black-spotted trout (cutthroat) and whitefish (peno). Glacier National Park circular (1931:27) states:

> "Crossley and other lakes on the Middle Fork of the Belly River will furnish excellent sport. Cutthroat and Mackinaw trout are found here."

Schultz (1941:40) indicated lake trout and mountain whitefish as present and cutthroat trout as having been planted in Crossley Lake. Holloway (1945:7) states:

> "We secured very little information on this lake as we were unable to take specimens by hand fishing and time did not permit the use of nets. A very small amount of brook trout reproduction was observed. The lake has a reputation of affording only poor fishing. Rainbow and brook trout provide most of the catch. If it is anticipated that the lake will have considerable use after the war, it should be stocked. Brook trout are probably best adapted to the conditions here. The lake has about 3 miles of shoreline with a "bench" averaging 50 feet in width, making 17 acres of stocking area. The food grade is 1; spawning facilities poor; and fishing intensity light. Recommendations are for 120 per acre or 2,040 three-inch brook trout fingerlings (or 1,265 five-inch). One planting should be adequate until further investigations are made. Whether it is desirable to plant this lake will depend, probably, on the presence or absence of a summer camp."

Kinnie (1960:13) says:

> "2.2 miles and a 300-foot climb from the Belly River Ranger Station on the Crossley Lake cut-off Trail. This very brushy lake has better fishing on the deep south side than on the north. Some good places to fish are; near the campground; at the inlet; the gravel beach on the upper north shore near the trail. Generally fair to good cutthroat, Eastern Brook and Mackinaw fishing."

Crossley Lake:	1921	70,000	Ct	
	1936	9,870	EB	3-1/2"
	1941	15,156	EB	2-1/2"
	1945	3,000	EB	4"
	1948	2,040	EB	4"

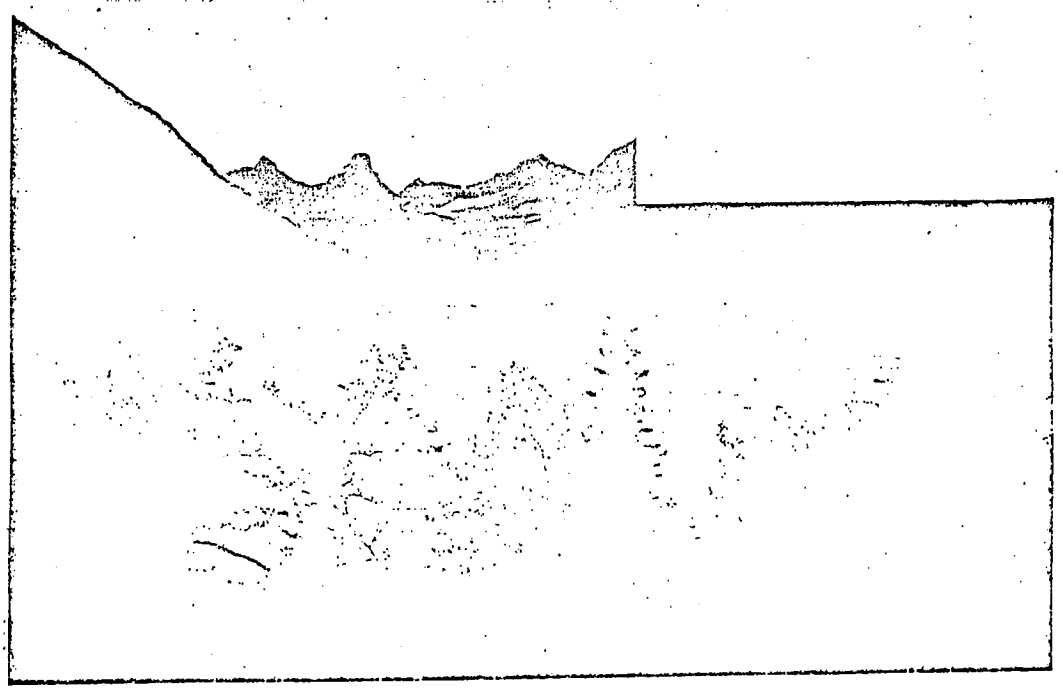
The following meager creel census results were obtained from Crossley Lake in 1959 and 1960:

Crossley Lake

	Census Date	Home State	No. in Party	Hours Fishd	No Fish	Spec.	Size Distribution of Catch 4-6	7-9	10-12	13-15	16-18	19+	Total Catch	Comments	
	7/15/59	-	5	10	5										
	8/22/59	-	4	24	0	Ct		2					2		
		(probably EB-wm)				DV			4				4		
						Wh		8	22				30		
	8/14/60	Calif	1	2	1										
	9/3/60	Alta	3	3	2	LT						1	1	32" weighed 15 lbs.	
						Ct		2					2	Ave length	14.0"
	4 census days!		13	39	8 EB (60%)	EB			4				4	Ave Hrs/Day	3.0
						LT								Ave Catch/Hr	0.72
						Wh		8	22			1	31	Ave Catch/Day	2.16
Totals								10	26			1	37	Quality Index (Fair)	30

A total of 13 anglers censused had fished 39 hours (3 hrs. per day avg.) to catch 28 fish (avg. of 0.72 fish per hr. or 2.16 fish per day), which averaged 14" long, which gives a quality index of 30 which is only fair fishing. The high percentage of unsuccessful anglers (60%) is another index of a poor fishery.

A fishery management study is needed at Crossley Lake to determine, if possible, what species are present; why fishing has been consistently only fair in this lake; and to try to work out some solution to the problem. It is very possible that aerial stocking of marked rainbow trout fingerling every other year or so could be a very valuable management technique in improving this fishery.



C-3. Kaina Creek: This small creek empties into the Mokowanis River between Crossley and Glenns Lakes. It might have a half mile of fishable waters above its mouth which is easily accessible by trail. The upper parts of this stream are too steep and too cold for fish. Its lower part should be surveyed and evaluated.

C-3a. Two Unnamed Tributaries of Kaina Creek - one from Kaina Mountain on right bank is too cold and steep for fish. The other from Whitecrow Glacier meanders through a flat valley about 1-1/2 miles long before emptying into the left bank of Kaina Creek. This might provide a fishable stream area, which should be surveyed for potential possibilities.

C-3b. Kaina Lake: This 40-acre lake with less than 1 mile of shoreline at 6,950-foot elevation is probably too high and cold for fish life. Nothing is known of the aquatic life of this lake.

C-4: Glenns Lake with its 320 surface acres and its 5.5 miles of shoreline at 4,870-foot elevation, is the largest body of water in the Belly River Management Area. Ranger Fitzpatrick estimated about 250 angler-days of effort on this lake in 1960, which places it second to Elizabeth Lake in the line of fishing intensity.

Regarding its fish and fishing, Brooks (1921) states it had Mackinaw (lake trout) Black-Spotted Trout (cutthroat) and whitefish (peno).

Schultz (1941:40) indicates Salvelinus namaycush and Prosopium williamsoni as present and Salmo clarkii as having been planted in Glenns Lake.

Holloway (1945:7) states:

> "This lake has about 6 miles of shoreline with a "bench" averaging 70 feet in width, making a stocking area of 51 acres. The food grade is Number 1, spawning conditions poor and fishing intensity light. Brook trout are recommended at the rate of 120 per acre or 7,080 3 inches in length (or 4,389, 5 inches in length). Not more than one planting should be done until further investigation has been made."

Kinnie (1960:14) states:

> "The outlet of this lake is 4 miles and a climb of 500 feet from the Belly River Ranger Station . . . . . Since the bottom is shallow near the shore, it is difficult to cast to the deep water. Some good places to fish are at the inlet and outlet, and from a sand bar which extends for 3-1/2 miles along the north shore from the outlet of the lake. Mostly excellent, large-size mackinaw and some cutthroat and eastern brook fishing."

Park Service Records indicate that cutthroats and eastern brooks have been planted in Glenns Lake as follows:

1922	Ct	180,000 eggs	
1936	EB	8,232,	3-1/2"
1941	EB	41,652,	2-1/2"
1945	EB	1,000,	4"
1946	EB	6,000,	4"
1948	EB	7,020,	3-1/2" (hauled by wagon 9/12).

Creel Census Data from Glenns Lake - 1959-1960.

Glenns Lake

Census Date	Home State	No. in Party	Hours Fished	No. Fish	Spec	Size Distribution of Catch 4-6	7-9	10-12	13-15	16-18	19+	Total Catch	Comments
6/24/59	-	2	12	0	LT				3	8		11	Most of these fish were taken on a red and white daredevil.
7/20/59	-	2	10	1	LT				3		1	4	
7/28/59	-	2	10	0	LT				1		3	4	
7/10/60	N. Mex.	2	6	0	LT				7		1 (22")	9	
9/6/60	Alta.	6	18	4	LT				2	3		5	
9/8/60	"	5	25	2	LT				2	2		4	
					Wh		8					8	
9/9/60	"	6	36	4	LT				4		2	6	19" wt 3½ lbs; 24½" wt 8 1/4 lbs.
		25	117	12									
7 census days!					LT				22	13	7	43	Ave Length 15.0"
					Wh		8					8	Ave Hrs / Day 4.7
Totals							8		22	13	7	51	Ave Catch / Hr. 0.44
													Ave Catch / Day 2.07
												(Fair)	Quality Index 31.

A total of 25 anglers censused had fished 117 hours (avg. 4.7 hrs. per day) to catch 43 lake trout and 8 whitefish (for an avg. of 0.44 fish per angler-hour) which averaged 15" long. This gives a quality index of 31 which is considered fair to poor fishing. The high percentage of unsuccessful anglers (48%) is another index of a slow or poor fishery.

A fishery management study is needed at Glenns Lake (as at Crossley) to determine why there are no other fishable species than lake trout. Here again, as at Crossley, it would appear that aerial plants of fingerling rainbow every other year or so could be a very efficient and useful management tool to improve this fishery and perhaps take some of the pressure off Elizabeth Lake.

C-4a: Whitecrow Lake. This 20 acre lake with 0.5 miles of shoreline at 6,250 foot elevation is probably too high and cold for fish life that would support a fishery. Nothing is known of the aquatic life in this little lake. Its outlet creek is too steep for fish.

C-4b: Pyramid Creek. No data on this creek although Brooks (1921) reports a 40-foot impassable falls between Glenns Lake and Mokowanis Lake, and another between Mokowanis and Margaret Lake. No creel census is available and no references have been found on fish or fishing in this inaccessible valley, except for Mokowanis Lake.

C-4b.aa: Mokowanis Lake (Lois Lake). This 50-acre lake with 0.8 miles of shoreline at 5,050-foot elevation is third in line of fishing intensity in the area. Kinnie (1960:14) states, "8 miles and a climb of about 600 feet from Ranger Station . . . . . Generally excellent eastern brook fishing". Although Ranger Fitzpatrick estimated 150 man-days of fishing took place in 1960, only one party turned in creel census forms in 1960 - none in 1959. A party of six Canadians from Alberta fished a total of 27 hours on two days (September 7 and 8, 1960) to catch 20 EB, 10" - 12" long and 6 EB, 13" - 15" long. Further details are presented below:

Mokowanis Lake

Census Date	Home State	No in Party	Hours Fishd	No Fish	Spec	Size Distribution of Catch 4-6	7-9	10-12	13-15	16-18	19+	Total Catch	Comments
9/7/60	Alta	6	9	0	EB			16	5			21	Used Hot Shot. Good Fishing for about 1 hour.
9/8/60	"	6	18	3	EB			4	1			5	
av		12	27	3	EB			20	6			26	

Ave. Length-11.7"; Ave Hrs/Day-2.2; Ave. Catch/Hr.-1.0; Ave Catch/Day-2.2 Quality Index-26 (Poor)

It appears that Mokowanis Lake supports a fair to poor or slow fishery for eastern brooks from the above meager data. Schultz (1941:40) records only eastern brook present in this lake which he calls Lois Lake. Park Service stocking records indicate that 60,000 cutthroat eggs were planted in 1922 and 2,200 eastern brook fingerling in 1924. Apparently none of these early cutthroat egg-plants produced surviving stocks of fish in any of the park lakes in which they were planted.

This lake needs more creel census and a management study information

C-4b.bb: Margaret Lake. No data are available on this inaccessible 80-acre lake with 1.8 miles of shoreline at 5,450 elevation. No creel census available and no references known. This whole valley should be surveyed for its fish and fisheries potential. Schultz (1941:40) statement that cutthroats had been stocked in Margaret Lake is born out by Park Service records which indicate that 52,500 cutthroat eggs were planted in 1922. To date there is no indication that any of these fish survived to reproduce.

C-4b.cc: Ipasha Lake: No data is available on this inaccessible 60-acre lake with 1 mile of shoreline at 5,650-foot elevation. It needs a survey to establish its future status as a barren lake or possible fishery potential. Nothing is known of its aquatic life.

C-4b.dd: Unnamed Lake: This small inaccessible 15-acre lake with about one-half of shoreline at 7,350-foot elevation located at the foot of Ipasha Glacier forms the source of Pyramid Creek. It is probably too high and cold to support fish life and will always be a barren lake.

C-5: The Upper Mokowanis River rises in Sue Lake, passes over two high falls within a one-mile stretch above Atsina Lake and two more below Atsina before emptying into Glenns Lake. The lower mile or so may be fishable - unless White Quiver Falls is located in that stretch. This should be checked out.

C-5a: An unnamed tributary 1.5 miles long on left bank is too steep for fish.

C-5b: Atsina Lake: (Middle Lake?) Although accessible by Stoney Indian Pass Trail, this small 15-acre lake at 5750-foot elevation is a shallow brushy lake which probably freezes to the bottom in winter. No fish or fishing are known to occur in its waters although Schultz (1941:40) reports Salvelinus fontinalis had been planted in it.

C-5c: An unnamed tributary and small pond are paralleled by the trail through Stoney Indian Pass. Although both are too small to be of any great value as fishing waters, the creek is of low gradient for about a half-mile below the lake. It might be desirable to furnish a few fish for use by hikers camping overnight at the small lake.

C-5d: Sue Lake: There are no known references to the fish or fishing in this 85-acre lake with 1.3 miles of shoreline at 7,050-foot elevation. A survey is needed to determine the more precise physical characteristics of this lake and its fauna. No fish are known to be present, and nothing is known of its aquatic life.

C - South Fork of the Belly River: Earlier references to the Belly River refer to the South Fork although recent maps refer to this stretch above the ranger station as the Belly River or the Upper River. We find it most convenient to refer to this stretch of the Belly River as the South Fork.

Brooks (1921) indicates the presence of three high falls (over 40 feet) in the South Fork or Upper River. The first is about 1/2 way between the forks and Elizabeth Lake; the second is at Dawn Mist Falls shown on map; and the third is about 1 mile below Helen Lake - just upstream from the mouth of Old Sun Glacier Creek. Schultz (1941:40) lists only Grayling (Thymallus montanus) as present in the South Fork.

D-1 and D-2: Four Unnamed Tributaries that enter the South Fork below Elizabeth Lake are too steep to be inhabited by fish.

D-3: Elizabeth Lake: This 240-acre lake with its 3.8 miles of shoreline at 5,020-foot elevation is the most heavily fished body of water in the Belly River Area. Ranger Fitzpatrick estimated 750-man-days of fishing effort took place in 1960.

Regarding the fish and fishing in Elizabeth Lake, Brooks (1921) says it was stocked with rainbow trout in 1920 and 1921 and contained no other species. A Glacier National Park circular (1931) states; "Large rainbow trout and grayling abound in Elizabeth Lake". Schultz (1941:40) lists salmo gairdnerii (rainbow) and Thymallus montanus (grayling) as present and planted originally. Holloway (1945:7) says:

> "This lake was fished from the bank with a fly rod. Excellent rainbow and grayling fishing was evident. No stocking is recommended because of the light fishing intensity. It is believed that adequate spawning facilities are available to maintain good fishing in this inaccessible lake." In his Table 4 Holloway (1945:15) reports taking 2 rainbows 3 years of age; and 7 grayling 3 years of age, averaging 325 mm and 358 mm in length, and 312 and 348 grams in weight, respectively;

Kinnie (1960:13) states:

> "A hike of 3.3 miles and 500-foot climb from the Ranger Station. The east side and head of the lake are hard to fish because the shallow bottom makes it difficult to cast into the deep water. There is good fishing in the bays on the west side of the lake. The best fishing is at the upper end of the lake near the inlet. In the early part of the season, there is about 50-50 ratio of grayling to rainbow at the foot of the lake. As the season advances, the rainbow seem to move to the head of the lake. This lake probably has the best large- and medium-size rainbow and grayling fishing in the Park."

Park Service stocking records indicate the following plants have been made in Elizabeth Lake: 1/

1920	5,000	Rb	1924	32,000	Rb
1921	80,000	"	1925	40,000	"
1922	45,000	"	1935	42,000	"
1923	9,360	"	1939	10,900	"
1924	40,000	Gr			

Excellent creel census data collected in 1959 and 1960 are presented in Table 2, p.2 for 1959; Table 2, p.3 for 1960 and a summary for the two years is presented in the following tables:

1/ The grayling and rainbows established themselves at Elizabeth Lake and the fishery has been supported since 1940 by natural propagation. Where the eastern brooks came from (as reported in the creel census) is unknown and it is hoped they are mis-identifications.

Lake Elizabeth (1959)

Census Date	Home State	No in Party	Hours Fished	No Success	Species No. Fish Released	Size 4"-6"	7"-9"	10"-12"	13"-15"	16"-18"	19"+	Comments - Bait or lure used	Ave length	Species Distribution of Catch Rb	EB	Gr.	Ct	Total/s	Hrs/Ang
7/3		1	1	0	Rb		6												
					EB		1					small spoons		6	1	3		10	
					Gr		1	2											
7/3+4	Ore. Miss. Wash. D.C.	3	24	0	Rb				41			spoons		41		7		48	
7/8		2	16	0	Gr					7									
					Rb			2			2								
				3	Gr	3		4	1		2	small spoons		4		7		11	
7/13+14		3	12	1	Rb			2	3										
					EB			2	1			" "		5	3			22	
					Gr		1	6	5	2						14			
7/16		2	10	0	Rb		1	2				spoons		3		8		11	
					Gr			4	3	1									
7/20		1	6	0	Rb		2	1				"		3		8		11	
					Gr		1	3	4										
7/23		4	20	0	Rb		2	4	1			" spinner		7		12		19	
					Gr			3	6	3									
7/25		1	6	0	Rb		3	5	4			flies		12		5		17	
					Gr			4	1										
7/27		2	10	0	Rb			6	2			flies + lures		8				8	
		19	105	1	Rb		8	28	31	2				89	4	64		~~100~~ 157	
				3	Gr	3	3	26	20	15									
8		2	16	0	Rb		1	4	8	3		" "		16	2	15		33	
					EB				2										
					Gr		3	5	6	1									
8/3		6	48	0	Rb		5	10	13	5		" "		33	5	36		74	
					EB			2	3										
				1	Gr	1	3	8	21	4									
8/4		2	16	0	3 Rb	3	2	4	6			small lures		12		18		30	
					Gr		1	4	12	1									
8/15		3	12	0	Rb			8	1			" spinners		9		10		19	
					Gr				10										
8/10		5	15	0	Rb			6	11			flies + grasshoppers		17		13		30	
					Gr			9	4										
		18	107	0															
		34	212	1	EB			5	6										
		37			4 Gr	4	10	52	73	21			126"	11					
					3 Rb	3	16	60	70	10				156			343	5.6	1.6
						7	26	117	154	31				176					

Qual. Index: H3 9 fish/AD

Fishercap Lake

7/22	Kans	2	4	0	EB		5							5					
7/23	"	2	6	0	EB		5							5					
7/24	"	2	4	0	EB		2							2					
7/30	Ill.	3	12	1	4 EB	4	3					worms		3					
8/4	Alta.	2	6	0	5 EB	5	10	2				home-made lures		12					
8/8	"	2	7	1	8 EB	8	15					dry fly, lures + worms		15					
			"Johnson very accommodating"														42		
		13	39	2	17 EB	17	40	2						42			42	3.0	1.0

Lake Francis ✓

8/	Alta	2	2	1	Ct		1								1				
8/5	Alta	2	10	0	Rb		2	2				lures + spoons		4			5		
		4	12	1													5	3.0	0.42

Date	Home State	No. in Party	Hrs Fshd	No. Success	Species	4-6	7-9	10-12	13-15	16-18	19+	Comments or Baits Used	Ave L.	Species Distrib. of Catch	Total Catch	Catch per Hr
									Cracker Lake ✓							
7/23	Mont	2	4	0	GT		20					Fish very hungry, skinny, & overstocked - needs more pressure.				
									Crossley Lake ✓							
8/14	Calif	1	2	1								flies spinner flatfish				
9/3	Alta	3	3	2	LT							1 (33") est at 30 lbs actually only 15 lbs				
									Elizabeth Lake ✓ (1960) ← (for Ellen Wilson - See Lake Ellen Wilson)							
6/7	Pa	2	10	0	Rb		13	15								
					Gr			7				dry flies				
6/27	Mont	11	55	2	Rb			50								
					Gr			10				Thompson lure				
7/2	Mont	3	9	1	Rb			1		4		daredevil				
	Wn	2	16	0	Rb			20								
					Gr			20				wonderful fishing				
7/3	Mont	3	15	0	Rb		2	9	3							
					Gr				1			water hi. larger fish at upper end of lake				
	[illegible]	1	1	0	EB		1									
					Rb			1				a bit slow today				
	Ind	5	50	1	Rb	2	4	3								
					Gr	4	4	12		2		Best Fishing. Trails in good shape				
7/4	Mont.	1	4	0	Rb		1	2								
					Gr							daredevil				
7/12	[illegible]	6	24	1	Rb		1	1	1							
					Gr			2				spinners				
7/13	S.Dak.	3	3	2	Gr			1				worm				
7/19	S.Dak	4	8	3	Gr		1					tried everything				
	Utah	3	36	0	EB			2								
					Rb			40				spinners & flies				
7/20	N.Y.	7	84	2	Rb			8	4	1		Good Fishing - Flies				
					Gr			4	2	3		& spinners				
7/22	N.Y.	7	77	3	Rb	3			4							
	[illegible]				Gr			8	3			everything				
	Pa	1	3		Rb		1	2				wobbler				
7/23	Mont	2	8	1	Gr	1						bait				
7/27	Ind.	2	14	0	EB		1					best fishing in 4 yrs				
					Rb			10	2	1		with NPS - flies				
					Gr				1	2	1	& spoons				
7/30	Pa	1	4	0	Rb				7							
					Gr		3					Royal Coachman				
8/8	Alta	5	10	0	Rb		2									
					Gr			3				flies				
8/9	Wn	8	48	0	Rb		12	11	34	17		good trails camp				
					Gr			4	20	7						
8/10	Mont	6	36	1	Rb							good flies				
					Gr				3			Good fishing!				
8/11	Mo	1	6	0	Rb		8									
					Gr			10				flies & spoons				
8/12	Wn	1	5	0	EB		8					flies				
	Iowa	2	8	0	Rb			6	2							
					Gr			2	3			flies				
8/13	Wn	1	2	0	Rb			5	1							
	Mont	3	18	1	EB		1									
					DV				2			fly - daredevil				
					Gr		6									
8/14	Mont	2	10	0	Rb		5	8				spinning				
					Gr		2	3								
8/17	Alta	10	20	4	Rb					1						
					Gr		1	2		2		Bow spoons. N. End of L.				
8/20	Mont	6	48	4	Rb		10					cols spinners worm windy good				
					Gr		2					campground				
[illegible]	Alta	3	15	0	EB		1	1								
					Rb			5				bear got one of our food knapsacks. had to leave early.				
					Gr			15				grasshoppers & dry flies				
9/2	Alta	3	12	0	Rb			8								
					Gr			2				flatfish				
		115	659	26	EB		12	5 or 2					11.3			
					Gr	5	19	107	13	16	1			5.7 Ho 0.82	96	
					Rb	5	57	204	73	24						
						10	80	318	80	40	1	Qual Index 528			3.42	

ELIZABETH LAKE (Continued)

A summary of the fairly adequate creel census data (see attached Table 2, p. 2&3) in 1950 and 1960 yields the following comparative data:

	1959				1960			
No. of days censused	16				24			
No. of anglers interviewed	37				115			
Home States: Montana	--				44 (38%)			
Alberta	--				21 (18%)			
Washington	--				12 (44%)			
Other States	--				38 (44%)			
Hours Fished	212				659			
Average Hrs. Fished per Man-Day	5.6				5.7			
No. of Anglers with no fish	1 (3%)				26 (23%)			
Size and Species Distribution of the Catch	Rb	Gr	EB	Totals	Rb	Gr	EB	Totals
4" - 6"	3	4		7	5	5		10
7" - 9"	16	10		26	59	19	12	90
10" - 12"	60	52	5	117	204	107	3	314
13" - 15"	90	73	6	169	72	13	2	87
16" - 18"	10	21		31	24	16		40
19" plus						1		1
Total each species	176	156	11	343	364	161	17	542
	51%	45%	4%		67%	30%	3%	
Average length of all fish caught	12.6"				11.3"			
Average catch per angler-hour	1.61				0.82			
Average catch per angler-day	9				4.7			
Quality Index (Avg. length X catch per day)	113 (superb)				52.8 (very good)			
Calculated Angler-days (inaccurate of course)	300				600			
Estimated No. Man-Days	--				750			

The foregoing summary of the 1959-1960 creel census from Elizabeth Lake indicates:

1) The amount of data collected in 1960 was half again as much as in 1959.

2) That approximately 40% of the fishermen were local anglers from Montana; 40% were visiting or tourist anglers from the rest of the United States; and 20% were local anglers from Canada.

3) The length of the average fishing day was 5.6 hours each year.

4) The percentage of unsuccessful anglers increased from 3% in 1959 to 23% in 1960. This is an indication of drop in quality.

5) The average length of fish caught declined from 12.6 inches in 1959 to 11.3 inches in 1960. This also is an indication of drop in quality.

6) The species composition of the over-all catch was very similar for both years; the rainbow take rose from 50% in 1959 to 67% in 1960 and the grayling catch fell from 45% in 1959 to 30% in 1960; the eastern brook catch was comparatively small at about 3 or 4% each year. It would appear that Elizabeth Lake is primarily a rainbow trout lake with an apparently declining grayling population. Two 14-inch Dolly Vardens were reported by a Montana angler. These were included with eastern brook in the table as a probable mis-identification.

7) The average catch per hour and per day were twice as much in 1959 as in 1960; another indication of a decline in quality.

8) Finally the quality index of 113 (superior) and 53 (very good to excellent) for 1959 and 1960 respectively reflects the falling off of fishing success in Elizabeth during the past two years. However, the quality index for both years of creel census was 80 which indicates the existence of a par excellent or superior sports fishery at Elizabeth Lake in recent years.

9) From the creel census collected, the following estimates of fishing effort were worked out on the basis of the number of anglers turning in creel census reports on the average Saturday, Sunday and weekday of each month.

Estimated number of man-days fished in Elizabeth Lake:

	June	July	August	September	Total
1959	23	102	129	23	300
1960	148	165	143	84	540

Assuming that half of the anglers turned in census reports, the total fishing effort may have run around 600 man-days in 1959 and 1,000 man-days in 1960. Ranger Fitzgerald's estimate of 750 man-days for 1960 was very good.

The good fishing of 1959 apparently attracted twice as many anglers in 1960. The estimated fishing effort for Elizabeth Lake in 1960 was greater than for all the other waters in both Waterton and Belly River areas combined.

Elizabeth Lake - Management Recommendations: This lake needs a fishery check by means of gill net sets to ascertain the recruitment rate of younger age classes to be sure we are not killing the goose that lays the golden egg. This lake has presented some of the most phenomenal fishing during the past two seasons that we have ever had the pleasure of recording. If the fishing pressure continues to increase on this lake as it has the past two seasons we should consider aerial stocking of marked fingerling rainbow trout every other year or so to assist whatever natural reproduction takes place in maintaining the excellent fishery reputation of this lake; or possibly reduce the present catch limit to five with a total possession limit of 10 fish per angler.

All indications from the 1960 creel census point to an increased angler-use and a corresponding decrease in angler-take at Elizabeth Lake in 1961. It is quite clear that an aerial stocking program is needed to maintain the present high quality of fishing in the face of the rapidly increasing fishing pressure.

D-3a: Redgap Creek and Lake: This small twelve-acre lake at 6,650-foot elevation is probably too high and cold for fish. Although it is accessible by trail, nothing is known of its aquatic life.

D-4: The topographic maps of the Park show a very flat valley in the South Fork between Elizabeth and Helen Lake. Consequently the lower extremes of the three unnamed tributaries that enter the left bank of the South Fork (all of which are crossed by the Ahern Pass Trail) should be surveyed along with the main stem of the Belly River to determine their fishery potentials.

D-5: Helen Lake: Very little is known about this 190-acre lake with its 2.3 miles of shoreline at 5,120-foot elevation. Brooks (1921) says "Grayling were stocked in Helen Lake in 1921 - no other species known in the lake." A Glacier National Park circular (1931:28) states; "In Helen Lake on the South Fork of Belly River grayling are plentiful."

Park Service records indicate the following plants in Helen Lake:

1921	400,000	Gr
1924	40,000	"
1936	4,116	EB

No creel census has ever been collected on this lake and no fishing has been known to take place in this lake during the past two years. Because of its size and the fact that it is accessible by good trail, it needs a fishery survey to ascertain what its fish and fishery potential really are.

D-5a: Four Unnamed Tributaries of Helen Lake are too small and too steep for fish.

D-5b: Two Unnamed Lakes of 10 and 15 surface acres at 5,500-foot elevation are too small, too cold, and probably too shallow to contain fish. Nothing is known about them - no fish have been stocked in them - to be left as barren waters.

REVIEW OF THE INDIVIDUAL WATERS OF THE ST. MARY RIVER DRAINAGE

The eastern corridor of the Belly River Management Area is drained by Lee and Otatso Creeks which are tributaries of the St. Mary River. This corridor extends from 3 to 4 miles inside the eastern park boundary to Lee Ridge. It is gently sloping in the northern half which is drained by the headwaters of Lee Creek (Most of Lee Creek flows through Canada). The southern half of the corridor is bounded on the west by the steep slopes of Gable and Seward Mountains in which Otatso Creek has its headwaters. Otatso Creek empties into Kennedy Creek which in turn empties into St. Mary River. Otatso Creek was originally known as the North Fork of Kennedy Creek.

A. Lee Creek: We have found no reference to fish and fishing in the six miles of Lee Creek Drainage in the northeastern corner of the Belly River Area. Nothing is known of its aquatic life. Park Service Records indicate the following fish have been stocked in Lee Creek:

1/	1937	45,000	1"	Ct
	1937	2,000	2-1/2"	EB
	1938	27,500	1"	Ct

B. Otatso Creek: There is very little recorded information on fish and fishing in Otatso Creek and its ten small lakes located in the southeastern corner of the Belly River Area. Brooks (1921) states that cutthroat and Dolly Varden were present in North Fork of Kennedy (Otatso) Creek and in Slide Lake. Nothing is known of the aquatic life in these waters except for Slide Lake which is accessible by trail from Belly River Ranger Station or by a much shorter trail that stems from a wagon road from the highway to a ranch or campsite on Otatso Creek just inside the Park boundary.

B.1: Slide Lake: Very little information is available on this 30-acre lake with its 0.8 miles of shoreline lying at 6,000-foot elevation about two miles by trail from the end of a wagon trail that ends just inside the eastern boundary of the park. About all we have is the following creel census collected in 1960:

1/ Brooks (1921) "Lee Creek - small native trout (no doubt but that the species is cutthroat").

Slide Lake

Census Date	Home State	No. in Party	Hours Fished	No Fish	Spec.	Size Distribution of Catch 4-6	7-9	10-12	13-15	16-18	19+	Total Catch	Comments
7/11/60	Mont. Calif.	5	10	2	Ct			2	1			3	Spinners, Daredevils
					DV			2				2	
7/12/60	"	6	48	0	Rb				1			1	daredevil, flatfish
					Ct			12	4			16	flies
					DV			2	1			3	
					Br	"How did a Brown Trout get into Slide Lake?"					1 (22" long but very poor)		
7/13/60	"	5	10	1	Ct			13	1			14	flies + daredevils
					DV			3				3	
	"Observed 3 Canadians baiting for trout by throwing handfuls of whole kernel canned corn into the water".												
7/17/60	Mont.	3	18	0	Ct			1	1			2	
					DV			1			1	2	
	Alta.	5	15	2	Ct					1		1	worms
	~~"~~	~~3~~	~~9~~		DV							1	
	"	3	9	3								0	corn; grasshoppers
7/27/60	Alta.	4	8	0	Rb		7	1				8	flies + spoons
					Ct			1				1	
					DV		4					4	
7/28/60	"	4	10	3	EB		1					1	flies, spoons, grasshoppers
					Rb		2					2	
					Ct		1					1	
7/29/60	"	2	2	1	DV			1				1	flies
7/30/60	"	2	6	0	Rb				1	1	1 (19"-2¼ lbs)	3	flies + spoons
					Ct				1		1 (19"-2½ lbs)	2	
					DV		1					1	
8/8/60	Mont.	8	48	5	Ct		4		1	4		9	flies
8/14/60	Alta.	6	36	2	Rb		1					1	lures
					Ct		1		3	2	1	7	flies + baits
als 10 days		53	220	19 (36%)	Ct		6	29	12	8	2	57	Ave. length 10.8"
					DV	1	6	9	1		1	17	" . Hrs per A-Day 4.0
					Rb		10	1	2	1	1	15	" Catch per Hr. 0.41
					Br						1	1	" " " Day 1.64
						1	22	39	15	9	5	90	Quality Index 17 (Poor)

This creel census gives the following summary information; 53 anglers, interviewed on 10 census days, fished 220 hours (4 hrs. per day) to catch 90 fish (0.41 per hr. or 1.6 fish per day) averaging 10.8" long for a quality index of 17 which is poor; 36% of the anglers caught no fish which also indicates poor fishing in Slide Lake. Species composition indicated 57 cutthroat, 15 rainbow, 17 Dolly Varden and 1 large 22" brown trout (unusual and improbable - but possible.) From the census it is estimated that something like 150 man-days of fishing may have occurred at Slide Lake in 1960. A management survey is needed here.

B.1-4: 4 Unnamed Tributaries and 4 unnamed lakes or ponds occur in this drainage which are too small or too steep to be considered potentially important as fishery waters. The writer is not sure which of the forks above Slide Lake should be considered the main stem of Otatso Creek. For purposes of this report we have temporarily considered the south fork - or that tributary with headwaters in Seward Mountain (which flows in a fairly straight northeasterly course to Slide Lake) as the main stem of Otatso Creek. The north fork, which bends sharply from the left bank of the main stem to bring in the overflow from four lakes including Otatso Lake, is considered to be an unnamed tributary (Lake Creek) of Otatso Creek. Above the confluence of these two streams, Otatso Creek appears to flow through a pretty flat valley for about a mile. This should be examined for possible fishery potential. The trail seems to end at present at this confluence.

B.5 and 6: Otatso Lake of about 35 surface acres at 6,850 feet and the smaller lake just below it of 20 surface acres at 6,750 feet elevation are inaccessible at present, but may not be for long if the wagon trail is extended to Slide Lake. They should be surveyed as soon as possible so that an intelligent decision may be reached as to whether they should remain inaccessible or developed as fishing waters.

TABLE 5

A Summary of Lakes and Fisherman Use in Belly River Area 1959 - 1960.

	Non-Fishable Surface Acres	Fishable Surface Acres	Fishable Estimated Man-days 1960.
A. Large Lakes (over 500 surface acres)			
None			
B. Medium Lakes (50 to 500 surface acres)			
1. Glenns Lake		320	250
2. Elizabeth Lake		240	750
3. Crossley Lake		240	125
4. Helen Lake	190		
5. Sue Lake	85		
6. Margaret Lake	80		
7. Miche Wabun Lake	80		
8. Ipasha Lake	60		
	495	800	1,125
C. Small Lakes (10 to 49 surface acres)			
1. Unnamed N.F.	10		
2. Unnamed Main Stem	10		
3. Kaina Lake	40		
4. Whitecrow Lake	20		
5. Mokowanis or Lois Lake		48	150
6. Unnamed (Ipasha Glacier)	15		
7. Atsina (Middle) Lake	15		
8. Unnamed (above Sue)	10		
9. Redgap	12		

TABLE 5
(continued)

A Summary of Lakes and Fisherman Use in Belly River Area 1959 - 1960.
(continued)

		Non-Fishable Surface Acres	Fishable Surface Acres	Fishable Estimated Man-days 1960.
C.	Small Lakes (continued):			
10.	Unnamed Lake (above Helen Lake)	10		
11.	" " " " "	15		
12.	Slide Lake		25	150
13-17.	Unnamed Otatso Ponds 508 acres	30		
18.	Unnamed Lake (Otatso Creek)	20		
19.	Otatso Lake	35		
		245	73	300
	Total for Area	740	873	1,425

TABLE 6

A Summary of Streams and Fisherman Use in Belly River Area 1959 - 1960.

	Non-Fishable Total Length in miles	Fishable Total Length	Fishable Fishable Miles	Est. No. Man-Days in 1960.
A. Large Streams or Rivers(lower streambed 100+ ft. wide; or over 25 mi. long)				
1. Belly River		7	7	50
B. Medium Streams or Creeks (Est. width 15-100 ft; or over 5 miles long.)				
1. North Fork B.R.		4	2	10
2. Middle Fork B.R. (Mokowanis R.)		8	3.5	35
3. South Fork B.R.		8	5.	20
4. Lee Creek	6.			
5. Otatso Creek		5.	3.5	0
C. Small Streams or Brooks (Est. width less than 15 ft. or length less than 5 miles)				
3 unnamed tributaries to North Fork B.R.	5.5			
8 unnamed tributaries to Main Stem B.R	22.			
Kaina Creek	3.			
2 unnamed tribs. Kaina Creek	4.			
Whitecrow Creek	1.2			
Pyramid Creek	4.			
Unnamed trib. White Quiver Falls	1.5			
" " above Sue Lake	1.1			
3 " " below Eliz. Lake	6.5			

TABLE 6
(continued)

A Summary of Streams and Fisherman Use in Belly River Area 1959 - 1960.
(continued)

	Non-Fishable Total Length in miles	Fishable Total Length	Fishable Fishable Miles	Est. No. Man-Days in 1960.
C. Small Streams, etc. (continued)				
3 unnamed trib. above Eliz. L.	5.7			
Redgap Creek	2.			
4 unnamed Tribs. to Helen Lake	3.			
3 " " " Otatso Cr.	4.			
Totals for:				
A. Large Streams or Rivers		7	7	50
B. Medium Streams or Creeks	6.	25	14	65
C. Small Streams or Brooks	63.5			
	69.5	32	21	115

FISHERY MANAGEMENT RECOMMENDATIONS FOR THE BELLY RIVER AREA

A) Streams:- There is practically no fishery on any of the streams in the Belly River Area, and what little exists indicates generally poor fishing in the moving waters. There seems to be no immediate need nor demand for any stream management effort.

B) Lakes:-

1) Elizabeth Lake has offered the most phenomenal sport fishing in Glacier National Park in recent years. Creel census of 1959 and 1960 indicates a decline in fishing quality with a rapid increase in fishing pressure. A management survey is needed to check on recruitment, and an aerial stocking program is needed to supplement the natural reproduction in the lake if the present high quality of fishing is to be maintained. Something in the order of 100,000 small fingerling rainbow (1/4 of them marked) should be stocked on alternate years (or every three years as indicated by the survey) in Elizabeth Lake. Perhaps it should be closed for a year or two to permit the fish population to recover properly.

2) Helen Lake should be surveyed (as it is a large lake at a fairly low elevation that is accessible by a good trail) to determine what its fish and fishery potential is or should be.

3) Crossley and Glenn's Lakes should be surveyed to determine why there are no other fishable species than lake trout. It appears highly probable that the fisheries of these two lakes could be greatly improved at small cost with some aerial plants of small rainbow fingerling on alternate or every three years.

4) Fishery surveys are also needed on Atsena, Mokowanis and Margaret Lakes in the Belly River Drainage and on Otatso and Slide Lakes in the St. Mary River Drainage to determine their present and future fishery potentials.

5) The remaining waters not listed above are at present inaccessible or accessible only with difficulty; have no significant fisheries at present, or for the few which do support a light fishery, have no apparent need for

developing their fisheries at present. In most cases these lakes and streams should be left undisturbed in their primitive native state as reserves for future scientific reference and study.

6. Recommendations for stocking of waters in the Belly River Area made by Hazzard (1935) are reproduced here for the record and for ready reference.

TABLE 7

BELLY RIVER

Name Stream or Lake	Section to be stocked	Species	Size	Number	Frequency
Belly River	Forks to boundary	Cutthroat	1-1/2	42,500	Annual
So. Fork Belly River	Forks to Dawn Mist Falls	Cutthroat	1-1/2	8,100	Annual
"	Elizabeth L. to falls	Rainbow & Grayling	Will be stocked from Elizabeth L.		
"	Between Helen & Elizabeth	No stocking recommended (too cold)			
Tributaries of South Fork	All too precipitous and cold - No stocking recommended				
Elizabeth L.	---	Grayling	1	33,600	Annual
		Rainbow	1-1/2	8,400	Annual
Helen L.	---	E. Brook	3	6,000	Annual
Middle Fork Belly River	Crossley L to Forks	Cutthroat	1-1/2	12,000	Annual
Middle Fork Belly R.	Between Glenn & Crossley L.	Will be stocked from lakes			
"	Between Lois & Margaret Lakes	Too cold and torrential for stocking			
Tributaries of Middle Fork Belly R.		Cold and torrential - No stocking recommended			
Crossley L.		E. Brook	3	20,500	Annual
Glenns L.	---	E. Brook	3	24,000	Annual
Lois L.		E. Brook	Natural spawning adequate		
Margaret L.		Calif. Golden trout	1-1/2	25,000	Exper. plant
Middle Lake	between Glenn's & Sue Lake	Calif. Golden trout	1-1/2	10,000	Exper. plant
Sue Lake	Lake too cold - food deficient - no stocking recommended				