THE TAKU RIVER ECONOMY: AN ECONOMIC PROFILE OF THE TAKU RIVER AREA

FINAL REPORT

PREPARED FOR:
United Southeast Alaska Gillnetters

McDowell GROUP

Research-Based Consulting

Juneau
Anchorage

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EXECUTIVE SUMMARY

The major commercial, recreational, and cultural activities in the Taku River area benefit residents of both Southeast Alaska and British Columbia. The key economic impacts of Taku River activities are summarized below:

- The ex-vessel value of the commercial harvest of Taku River salmon has been between $603,000 and $2.9 million since 1994. The ten-year average is approximately $1.3 million. Sockeye accounted for about 86 percent of the total US commercial harvest value in 2003.

- The first wholesale value of the US commercial harvest of Taku River salmon has ranged from $2 million to $7.4 million since 1994. The ten-year average value is approximately $3.4 million. About 80 percent of the first wholesale value of Taku River salmon was from the sockeye harvest in 2003.

- The total economic impact of the US commercial harvest and processing of Taku River salmon includes 80 jobs, $1.4 million in labor income, and $5.4 million in total regional economic output.

- Approximately 400 people earn income from the commercial harvest of Taku salmon, including permit holders and their crew, processing employees and others.

- Taku River chinook account for a significant portion of the total sport catch from Juneau waters. For example, the percentage of chinook salmon from the Taku River has ranged from 56 to 93 percent of the total spring sport catch volume from the Juneau area since 1994.

- Based on an estimated $1.5 million in sport fish related expenditures, the total economic impact of sport fishing for Taku River salmon in the Juneau area, including direct, indirect and induced effects is approximately 40 jobs, $700,000 in labor income, and $2 million in total economic output.

- There were 123 personal use permits fished in 2003, and a ten-year average of 130 permits. An annual average of 18 chinook and 1,200 sockeye are caught in the US personal use fishery in the Taku River. Applying a substitution value of $5.00/pound based on the cost of substitute foods at retail stores, the ten-year average harvest of 1,380 salmon is worth approximately $44,000 annually.

- The economic activity from the first wholesale value of the Canadian commercial harvest in the Taku River has been between $478,000 and $1 million since 1994. The ten-year average first wholesale value is approximately $734,000.

- Approximately 60,750 visitors participated in some type of flightseeing tour in the Taku River area in 2003. This includes visitors to the Taku Glacier

Lodge, glacier landings, trekking, dogsledding, and other sightseeing activities. Including charter flights, the approximate retail value of all commercial tourism related aircraft activity in the Taku River area was $13 million in 2003.

- The total direct, indirect, and induced economic impacts of commercial air activity was 150 jobs, $5.5 million in labor income, and $18 million in total economic output in 2003.

- Sportsmen visit the Taku River area on both sides of the border on guided and unguided hunts for moose, mountain sheep, mountain goats, grizzly bears, black bears and other game animals. Some game is hunted by members of the Taku River Tlingit First Nation and other Atlin residents, and contributes to the subsistence economy of Atlin. Including the replacement value of these traditional foods, expenditures on non-guided hunts, and the typical cost of guided hunting packages, hunting activities in the Taku River area on both sides of the border are worth approximately $155,300 annually.

- Approximately 80 people participated in guided river trips on the Taku River in 2003, spending an estimated $240,000 on trip packages.

- Annual property tax from private parcels in the Taku River area received by the City and Borough of Juneau is approximately $300,000.

Inventory of Current Economic Activities in the Taku River Area

Fishing Activities	
US Activity	
Total economic impact of US commercial harvest of Taku River salmon	$5.4 million
Annual average employment from US commercial harvest	80
Total participation in US commercial harvest	400
Total economic impact of sport fishing for Taku River salmon	$2 million
Annual average employment from sport fishing for Taku River salmon	40
Substitution value of US Taku River personal use fishery	$44,000
Average number of participants in personal use fishery	130
BC Activity	
First wholesale value of BC commercial harvest of Taku River salmon	$734,000
Substitution value of BC aboriginal harvest of Taku River salmon	$29,000
Recreational Activities	
Commercial air activity in Taku River area (total value)	$18 million
Annual average employment from commercial air activity	150
Guided river excursions (total value)	$240,000
Average number of participants	80
Hunting activities (total value)	$155,300
Annual CBJ property tax from private parcels in the Taku River area	$300,000
Mining Activities	
Value of mining exploration programs	Variable

Purpose of Study

The purpose of this study is to provide a detailed inventory and economic assessment of the major business and recreational activities currently occurring in the Taku River area. The Taku River watershed hosts a diverse range of commercial and recreational activities that benefit the residents of both Southeast Alaska and British Columbia. Flightseeing and glacier landings, commercial fishing in Taku Inlet and on the Canadian side of the border, as well as sport fishing and aboriginal and personal-use fishing and hunting all have regional economic impacts. Mining is a minor activity at the current time but it could also bring economic benefits to the region in the future, primarily to BC. The purpose of this study is to measure economic values of current activities on the Taku River. With a detailed assessment of these values, residents and policy makers on both sides of the border can make more informed decisions about management of this important area.

Scope of Work

Study methodology calls for identifying public and private economic assets in the Taku River valley and the activities associated with them. Specific areas examined include:

Commercial fishing in Alaska. The study estimates the volume and value of Taku River-related gillnet harvests, and, to the extent data is available, other commercial fisheries with a link to Taku River salmon. In addition to harvest volumes and ex-vessel values, the study identifies the number of permit holders and crew earning income from Taku River-related fisheries.

Processor values. Based on the harvest data and the regional average first wholesale value, the study estimates the first wholesale value of commercially caught Taku River salmon.

Commercial fishing in British Columbia. Though this represents a relatively low level of commercial activity, it is important to participants in the fishery. These gillnet-caught fish are sometimes sold in Juneau.

Recreational and personal use fishing in the Taku River, in waters of Taku Inlet, and in adjacent waters. Valuation of recreational activity is always challenging. However, the study considers the number of people participating in these activities, their harvest and their typical spending.

Commercial flightseeing activity. The study researches the number of flightseeing operations in the Taku River area, the number of passengers served, and total visitor expenditures for this activity. This includes Taku Glacier Lodge customers and related fixed wing activity, helicopter flightseeing and glacier landing activity.

Mining. Several mine projects in the Taku River area are being explored. One project, the Tulsequah Chief mine, is currently in the planning stage. The study summarizes the status of these projects, the schedule for development, expected mine life, employment impacts, and potential local economic benefits.

Other commercial activities. These include guided hunting and guided raft and kayak trips on the river.

Methodology

The inventory of Taku River economic activity was developed from the following sources:

- Interviews with businesses operating in the Taku River area, including fishing, guiding, sightseeing, mining, and other businesses.
- Alaska Department of Fish & Game commercial and recreational catch and harvest value statistics, and also fishing, hunting, and guiding permit information.
- BC Ministry of Environment Wildlife Branch estimates of game harvested in the Taku River area in BC.
- Taku River salmon management data from the Pacific Salmon Commission Transboundary Technical Committee.
- Alaska Department of Natural Resources analysis of mining and mining deposits.
- US Forest Service and State of Alaska cabin-use records and land designations.
- City and Borough of Juneau real estate and tax records.
- Taku River Tlingit First Nation land management office for information on aboriginal use of the area.

Estimating the economic value of recreational activities is especially difficult. Individuals engaged in recreation typically derive multiple benefits. For example, part of the reward of sport fishing is catching fish. However, other benefits include scenery and wildlife viewing, shared family experiences, relaxation, etc. Many of these benefits are not directly associated with, nor dependent upon, the number or size of fish caught.

This study takes into account the varied nature of recreational benefits to the extent that it is practical to do so. Where benefits are impossible to quantify, they are described qualitatively. Where data on economic impacts is inconclusive, estimates may reflect a range of reasonableness that is based on McDowell Group experience and/or opinions of other knowledgeable parties.

Geographic Setting

The Taku River flows approximately 100 miles from the interior of British Columbia, meeting tidewater at the mouth of Taku Inlet about 10 miles southeast of Juneau, Alaska. The Inlet and the lower 40 kilometers of the river are located in US waters. However, most of the Taku River lies in Canada.

Comprising an area of 4.5 million acres, the Taku River watershed is the largest unprotected wilderness river system on the west coast of North America. The area drained by the Taku River is twice the size of Yellowstone National Park and is a wildlife habitat for healthy populations of several species of large mammals, including grizzly bear, mountain goat, Stone sheep, woodland caribou, moose, and black bear, as well as bald eagles and many species of migratory birds. The Taku River supports significant runs of the five salmon species, cutthroat and steelhead trout, Dolly Varden char and whitefish.

The Taku River valley hosts a diverse range of commercial and recreational activities that benefit residents of both Southeast Alaska and British Columbia. Commercial fishing occurs in Taku Inlet and the surrounding waters of Stephens Passage and inriver on the BC side of the border. Personal use fishing and sport fishing activity also occurs inriver to a lesser degree. Flightseeing and glacier landings, hunting and other wilderness recreation activities all contribute to the regional economies of Juneau and Atlin, BC.

Land Use

First Nations Traditional Land Use

The Taku River valley is part of the traditional territory of the Taku River Tlingit First Nation. Located in northwestern British Columbia, present-day Taku River Tlingit territory encompasses the entire 4.5 million acre Taku River watershed, extending from the Yukon Territory to the Alaska panhandle.

This area has been occupied by the Taku River Tlingit people for thousands of years. Within this enormous region there are many culturally significant sites including an extensive network of historic trails such as the Nakina trail in the Big Canyon area, the remains of former villages, cabins, semi-underground dwellings, grave houses, hearths and drying racks, food cache pits, and hunting and fishing camps.

The Taku River area continues to be used by the Taku River Tlingit as part of a land-based way of life. Use of the area for traditional harvesting activities including hunting, fishing, trapping and gathering still plays an important role in the cultural

and economic lives of many Native people. The Nakina Centre for Aboriginal Language and Learning, a present-day cultural center for Tlingits, is located at a fish camp along the Nakina River, one of the major tributaries of the Taku River.

Tlingit people from the Juneau area have cultural ties to the Taku River Tlingit and the Taku River valley. Douglas Island Tlingits traditionally spent summer months at fish camps along the Taku River, harvesting salmon near the Taku Glacier, and may have historically harvested hooligan from the Taku River system. The Taaku Kwaan Tlingit resided in several year-round villages along the Taku River. The most prominent was called Taku village and was located across from the Taku Glacier.

Commercial and Recreational Uses

The Canadian community of Atlin, located along the eastern shore of Atlin Lake in Northern British Columbia and Juneau, Alaska are the communities nearest the Taku River. There are approximately 450 year-round residents of Atlin, about one-half of whom are Taku River Tlingit, and about 32,000 residents of Juneau. Many residents of Atlin and Juneau make use of the Taku River, its tributaries, and the surrounding lands for salmon fishing, hunting, gathering, and other cultural activities. The Taku River is also a common recreational area for many residents of Juneau and Atlin. About 40 private cabins and three public-use Forest Service cabins have been built along the banks of the Taku River.

Taku River salmon are caught on both sides of the Alaska-Canada border. Commercial, sport, and personal use fisheries take place in Taku Inlet on the US side of the border. A significant volume of Taku River salmon are also harvested in the larger District 111 gillnet fishery in Stephens Passage. Inriver commercial and subsistence harvests occur on the Canadian side of the border. A local branding effort by the Taku River Tlingit First Nation, called Taku Wild, was in the first year of production in 2003.

Tourism activities routinely bring visitors to the Taku River and Taku Glacier Lodge by boat, helicopter, and floatplane during the summer months. Flightseeing tours in the area of the Taku and Norris Glaciers bring thousands of visitors to the area for glacier landings, dogsledding and trekking tours.

Some small-scale gold prospecting took place in the area during the Klondike rush. This developed into large-scale mining activity at several deposits in the Taku River valley during the 1920s and 1930s. A settlement called Tulsequah was established at the mouth of the Tulsequah River, and served as a place for miners to resupply. Mining continued in the Taku River valley until 1957, when the Cominco Mining Company closed their mines due in part to low metal prices. Mining activity in the Taku River valley has been limited since that time, but future development in the area is being considered.

Land Management

Alaska Land Designations

The United States Forest Service manages the vast majority of land in the Taku River valley. The majority of federal land adjacent to the river corridor from the Canadian border south to approximately Sunny Cove on the west shore and Jaw Point on the east shore is designated as Semi-Remote Recreation.

The area south of Jaw Point and Sunny Cove to the confluence of Taku Inlet and Stephens Passage is designated Scenic Viewshed, with two smaller areas designated Old-Growth Habitat.

The uplands above the river corridor on the east side of the Taku River are designated Remote Recreation. For the purpose of this study all of the uplands adjacent to the west side of the Taku are designated Semi-Remote Recreation. Below are the definitions of these designations from the 2003 Tongass National Forest Land Management Plan Revision Final SEIS.

- Semi-Remote Recreation - Provide for recreation and tourism in natural-appearing settings where opportunities for solitude and self-reliance are moderate to high.

- Remote Recreation - Provide for recreation in remote natural settings outside wilderness, where opportunities for solitude and self-reliance are high.

- Scenic Viewshed - Maintain scenic quality in areas viewed from popular land and marine travel routes and recreation areas, while permitting timber harvest.

Private Property

There are few private land holders on the lower Taku River. Most private holdings are located between the Taku Glacier Lodge and the Canadian border. The majority of private land is located from the area north of the Taku Lodge to the north end of Canyon Island. The City and Borough of Juneau (CBJ) considers land in the Taku River area rural non-roaded.

There are three rural non-roaded areas in the vicinity of the Taku River: Taku River, Taku Valley, and Taku Point. The values used in this report are from the CBJ Finance Department Assessor's Database, frozen as of December 2003. New appraisals are expected to be sent out in early April 2004.

The Taku River area contains 119 parcels with a total property value of $5.4 million. Some type of structure is present on 43 of these parcels. There are 29 parcels owned by the State of Alaska Department of Natural Resources with a total value of $1.8 million. These parcels are exempt from CBJ property taxes. None of the State

properties include any structures. The total taxable value of the parcels and structures in the Taku River area is $ 3.6 million.

The Taku Valley area contains 82 parcels with a total property value just over $1 million. There are three parcels that include structures and have a total property value of $587,000. The Taku Glacier Lodge is in this area and has a total property value of $560,800. The total taxable value of parcels and structures in the Taku Valley area is $587,000.

The Taku Point area contains five parcels with a total property value of $254,800. One parcel includes a structure and all of the parcels are taxable.

Based on the mill rate for 2003 (6.72 mills), the total property tax received by the City and Borough of Juneau from the Taku River area is approximately $300,000. (See Table 1.)

Table 1
Taxable Value and Property Taxes in the Taku River Area

Location	Taxable Value	Property Tax
Taku River	$3,600,000	$241,920
Taku Valley	$587,000	$39,446
Taku Point	$254,800	$17,123
Total	$4,441,800	$298,489

Taku River Fisheries

As Taku River salmon are harvested on both sides of the US-Canadian border, both countries have an interest in managing the resource to ensure healthy future salmon returns. The US fishery in Taku Inlet has significant influence in the number of salmon that return to the Canadian side of the river. Management of Taku River salmon is a co-operative effort by Canada and the US as a result of negotiations of the Pacific Salmon Treaty.

Alaska Commercial Harvest

Taku River salmon are harvested commercially in the US gillnet fishery in District 111, and in northern Southeast Alaska seine and troll fisheries. The District 111 commercial drift gillnet fishery occurs in the waters of Taku Inlet, Port Snettisham, and Stephens Passage.

The gillnet fishery was open for a total of 78 days from June 15 through October 16, 2003. There were 168 Southeast gillnet permits fished in the district. The District 111 gillnet fishery has traditionally targeted sockeye and summer chum salmon during the early part of the season through mid-August and fall chum and coho salmon later in the season.

There is currently no directed chinook or pink salmon fishery in District 111; both species are harvested incidentally during the directed sockeye fishery. A recent meeting between representatives of ADF&G and Fisheries and Oceans Canada to discuss a directed chinook fishery based on excess escapement (estimated at 20,000 additional chinook) did not result in a decision to proceed with the fishery in the near future due to disagreement over the distribution among US and Canadian fishermen. If the harvest had been approved, these 20,000 chinook may have brought approximately $528,000 in ex-vessel value to US and Canadian fishermen (about $1.6 million in first wholesale value).

Poor prices for coho and pink salmon have reduced harvest effort for these species in recent years. It is important to note that the current value of the fishery may not be predictive of future values, as healthy future runs may become economically beneficial to harvest under different market conditions. The harvest volumes from the District 111 gillnet fishery since 1994 are shown in Table 2. Gillnetters have harvested between 329,000 and 915,000 salmon in District 111 since 1994. The ten-year average harvest was approximately 620,000 salmon.

Table 2
US Commercial Gillnet Harvest of Salmon by Species in District 111, 1994-2003
(in numbers of fish)

Year	Chinook	Sockeye	Coho	Pink	Summer Chum	Fall Chum	Total
1994	5,047	105,861	188,501	401,525	198,002	16,169	915,105
1995	4,660	103,377	83,626	41,269	339,178	10,920	583,030
1996	2,659	199,014	33,633	12,660	347,612	6,455	602,033
1997	2,804	94,745	3,515	51,424	173,804	3,060	329,352
1998	794	69,677	28,713	168,283	291,416	4,695	563,578
1999	1,841	79,425	17,273	59,316	429,213	4,639	591,707
2000	1,137	168,272	7,546	54,716	665,582	3,013	900,266
2001	1,696	290,450	22,529	122,829	235,276	1,693	674,473
2002	1,840	178,488	39,823	77,562	230,092	929	528,734
2003	1,465	205,433	23,707	112,395	169,214	1,206	513,420
10-yr. avg.	2,394	149,474	44,887	110,198	307,939	5,278	620,170

Source: Pacific Salmon Commission's Transboundary Technical Committee, *Preliminary Estimates of Transboundary River Salmon Production, Harvest and Escapement and a Review of Joint Enhancement Activities in 2003*, February 2004.

District 111 is a mixed stock fishery where salmon returning to different spawning grounds are harvested in a common area. Therefore, the full harvest volume for District 111 should be adjusted to account for stocks returning to hatcheries and other rivers. The percentages of chinook and sockeye attributable to the Taku River are analyzed by ADF&G and Fisheries and Oceans Canada as part of the transboundary management effort required under the Pacific Salmon Treaty. For example, in 2003 the Taku River contributed 70 percent of the commercially harvested sockeye and 78 percent of the chinook salmon in District 111. These are within the typical ranges for these species during the 1994 to 2003 period.

The stock composition of coho, pink and chum salmon in District 111 is not currently available. However, ADF&G estimates that 78 percent of coho caught in the district are of Taku River origin. Pink salmon stock composition is unknown, but is estimated at 50 percent for the purposes of this report. The typical return timing of hatchery chum indicates that almost all of the summer chum harvest is comprised of hatchery fish, while the fall chum run is mainly Taku River stock. Using these estimates, the approximate number of fish harvested in District 111 attributable to the Taku River has been calculated and is shown in Table 3. US commercial gillnetters have harvested between 112,000 and 464,000 salmon annually from the Taku River since 1994, a ten-year average of approximately 217,000 fish.

Table 3
Estimated US Commercial Gillnet Harvest of Salmon from District 111 Attributable to the Taku River, 1994-2003
(in numbers of fish)

Year	Chinook	Sockeye	Coho	Pink	Summer Chum	Fall Chum	Total
1994	3,937	97,075	147,031	200,763	0	16,169	464,973
1995	3,635	90,972	65,228	20,635	0	10,920	191,389
1996	2,074	187,272	26,234	6,330	0	6,455	228,365
1997	2,187	78,259	2,742	25,712	0	3,060	111,960
1998	619	49,471	22,396	84,142	0	4,695	161,323
1999	1,436	63,302	13,473	29,658	0	4,639	112,508
2000	887	131,757	5,886	27,358	0	3,013	168,901
2001	1,323	207,091	17,573	61,415	0	1,693	289,094
2002	1,435	116,731	31,062	38,781	0	929	188,938
2003	1,143	144,419	18,491	56,198	0	1,206	221,457
10-year avg.	1,868	119,579	35,012	55,099	0	5,278	216,835

Source: Pacific Salmon Commission's Transboundary Technical Committee *Preliminary Estimates of Transboundary River Salmon Production, Harvest and Escapement and a Review of Joint Enhancement Activities in 2003*, February 2004.

In addition to the gillnet harvest, wild salmon originating from the Taku River are harvested in commercial troll and seine fisheries. US trollers have harvested between 660 and 2,700 chinook, and between 8,800 and 97,000 cohos from the Taku River since 1994. Based on data from the most recent ten-year period (nine years of data are available for coho), the annual average troll harvest of Taku River salmon has been approximately 1,600 chinook and 37,000 coho salmon.

Table 4
Estimated US Commercial Troll Harvest of Salmon Attributable to the Taku River, 1994-2002 (in numbers of fish)

Year	Chinook	Coho	Total
1994	1,500	97,040	98,540
1995	1,500	45,042	46,542
1996	1,605	24,780	26,385
1997	1,479	8,823	10,302
1998	656	28,827	29,483
1999	811	36,229	37,040
2000	1,484	21,018	22,502
2001	2,225	32,454	34,679
2002	2,665	39,025	41,690
2003	2,133	na	2,133
Annual average	1,606	37,026	38,632

Note: Chinook harvests for 1994 and 1995 are ADF&G estimates; 2001-2003 are preliminary estimates from ADF&G. The 2003 coho harvest volume was not available at the time of this report; therefore, the average harvest of coho salmon is based on a nine-year average for the period 1994 to 2002.

Source: ADF&G, *Stock Status and Escapement Goals for Coho Salmon Stocks in Southeast Alaska*, February 2003, and *Stock Status and Escapement Goals for Chinook Salmon Stocks in Southeast Alaska*, February 2003.

In addition to pink salmon, other species of Taku River salmon are harvested incidentally in the seine fishery. Data is available for the incidental seine harvest of Taku River coho salmon due to this species' inclusion in the monitoring programs required under the Pacific Salmon Treaty. No reliable estimates are available for the proportion of pink or chum salmon harvested in the seine fishery that can be attributed to the Taku River due to the lack of monitoring programs for these species.

The seine harvest volumes for Taku River cohos since 1994 are shown in Table 5. Seiners have caught an incidental harvest of between 220 and 26,350 salmon annually since 1994. An unusually large return of coho salmon to the Taku River and other spawning systems in the area resulted in a significantly larger than average harvest in 1994. Excluding this atypical year, the harvest has averaged approximately 1,600 cohos annually; the annual average including the large return is 4,400 cohos.

Table 5
Estimated US Commercial Seine Harvest of Coho Salmon Attributable to the Taku River, 1994-2002 (in numbers of fish)

Year	Coho
1994	26,352
1995	1,853
1996	220
1997	550
1998	742
1999	2,881
2000	1,577
2001	2,096
2002	3,457
2003	na
Annual average	4,414

Note: The 2003 coho harvest volume was not available at the time of this report; therefore, the average harvest of coho salmon is based on a nine-year average for the period 1994 to 2002.

Source: ADF&G, *Stock Status and Escapement Goals for Coho Salmon Stocks in Southeast Alaska*, (Special Pub. No. 03-02) February, 2003.

The ex-vessel value (the price paid to fishermen for their catch) of Taku River salmon is estimated by year in Table 6. Value is based on the Southeast region average fish size, multiplied by the region average price per pound specific to the drift gillnet, troll and seine fisheries. The ex-vessel value of the US commercial harvest of Taku River salmon has ranged between $603,000 and $2.9 million since 1994. The ten-year average ex-vessel value is approximately $1.3 million. Sockeye accounted for about 86 percent of the total harvest value in 2003.

Table 6
Estimated Ex-Vessel Value of Salmon Attributable to the Taku River, 1994-2003

Year	Chinook	Sockeye	Coho	Pink	Summer Chum	Fall Chum	Total
1994	$109,900	$852,100	$1,733,300	$124,000	$0	$34,800	$2,854,200
1995	$92,000	$654,800	$607,400	$13,300	$0	$33,400	$1,401,000
1996	$71,700	$1,408,500	$228,300	$1,600	$0	$12,000	$1,722,100
1997	$74,100	$440,400	$70,900	$10,500	$0	$6,600	$602,600
1998	$20,200	$338,800	$252,800	$45,900	$0	$8,100	$665,800
1999	$41,000	$498,500	$280,600	$14,700	$0	$8,000	$842,800
2000	$64,500	$834,800	$147,500	$13,800	$0	$7,600	$1,068,100
2001	$84,000	$1,221,000	$202,700	$27,000	$0	$5,800	$1,540,500
2002	$55,700	$576,700	$250,900	$10,300	$0	$1,500	$895,100
2003	$55,900	$854,200	$64,400	$16,500	$0	$1,600	$992,700
10-year avg.	$66,900	$768,000	$383,800	$27,800	$0	$11,900	$1,258,500

Source: Southeast Alaska region exvessel value by gear type from ADF&G *Report to the Board of Fisheries, Summary of the Southeast Alaska/Yakutat Commercial, Personal Use, and Subsistence Salmon Fisheries*, 1996-2003, and harvest volumes reported in the Pacific Salmon Commission's Transboundary Technical Committee report, *Preliminary Estimates of Transboundary River Salmon Production, Harvest and Escapement and a Review of Joint Enhancement Activities in 2003*, February 2004.

First Wholesale Value of the Commercial Harvest

The ex-vessel value represents the amount paid to harvesters, and is only one aspect of the value of the Taku River fishery. An additional measure of economic activity associated with fishing is the first wholesale value. The first wholesale value is the value of fish as it is sold to markets outside Southeast Alaska. It includes the amount spent by processors purchasing fish from harvesters, and the value added by processing and packaging. (Additional value is added outside of Alaska in the distribution and retail chain, however it is not considered in the scope of this study.)

In the absence of data specific to District 111, the regional ex-vessel and first wholesale values for Southeast salmon have been applied to the Taku-stock harvest volume. The following table shows the estimated first wholesale value of Taku River salmon, which includes the ex-vessel value paid to fishermen. These values represent the processors' profit, as well as the money spent for expenditures on fish, labor, utilities, and goods and services. (See Table 7.)

Table 7
Estimated First Wholesale Value of US Commercial Harvest of Taku River Salmon, 1994-2003

Year	Chinook	Sockeye	Coho	Pink	Summer Chum	Fall Chum	Total
1994	$227,200	$1,867,700	$4,255,600	$886,900	$0	$164,200	$7,401,600
1995	$190,700	$1,437,300	$1,575,200	$78,400	$0	$101,200	$3,382,900
1996	$138,600	$3,682,700	$674,700	$24,100	$0	$59,800	$4,580,100
1997	$140,800	$1,578,300	$157,000	$123,300	$0	$31,100	$2,030,500
1998	$44,000	$937,200	$704,800	$321,600	$0	$39,700	$2,047,300
1999	$86,700	$1,292,100	$598,200	$117,200	$0	$43,200	$2,137,400
2000	$115,300	$2,318,900	$367,000	$143,600	$0	$39,800	$2,984,700
2001	$166,300	$2,899,900	$484,400	$240,700	$0	$18,600	$3,810,000
2002	$138,000	$1,843,800	$671,300	$132,600	$0	$9,500	$2,795,200
2003	$144,300	$2,528,900	$242,600	$243,100	$0	$10,700	$3,169,700
10-year avg.	$139,200	$2,038,700	$973,100	$231,200	$0	$51,800	$3,434,000

Source: McDowell Group estimate based on ADF&G harvest volumes, the ex-vessel prices for gillnet, troll and seine salmon and first wholesale value from the ADF&G Commercial Operator's Annual Report (COAR) database.

The first wholesale value of the US harvest of Taku River salmon has ranged from approximately $2 million to $7.4 million since 1994. The ten-year average value is approximately $3.4 million. In 2003, about 80 percent of the first wholesale value of Taku River salmon was due to sockeye salmon.

This income creates additional economic activity in the local economy, referred to as a multiplier effect. The total economic impact of the commercial harvest and processing of Taku River salmon includes 80 jobs, $1.4 million in labor income, and $5.4 million in total regional economic output. This employment is a measure of annual equivalent employment. Total participation in the harvest and processing of Taku River salmon is much larger. For example, approximately 336 fishermen participated in the gillnet harvest, assuming 1 skipper and one crew per vessel. These estimates are based on IMPLAN economic impact analysis. IMPLAN, a predictive input/output model, provides employment, labor income, and economic output multipliers for a broad range of sectors in Southeast Alaska's local and regional economies.

Alaska Personal Use and Sport/Charter Harvest of Taku Salmon

In addition to the commercial harvest, Taku River salmon are also caught in the Juneau area sport fishery and inriver personal use fishery. Residents are limited to two chinook per day, and one fish per day with a three fish annual limit for non-residents. The seasonal bag limit is five sockeye per person or ten per household. There were 123 personal use permits fished in 2003, and a ten-year average of 130 permits.

Table 8
Salmon Catch in the US Personal Use Fisheries in the Taku River, 1994-2003
(in numbers of fish)

Year	Chinook	Sockeye	Coho	Pink	Chum	Total	# of Permits
1994	21	1,111	93	76	3	1,304	116
1995	18	990	97	40	6	1,151	106
1996	33	1,189	67	110	5	1,404	130
1997	16	1,053	27	86	1	1,183	123
1998	15	1,153	86	225	2	1,481	130
1999	22	1,254	44	105	3	1,428	147
2000	22	1,134	31	68	7	1,262	128
2001	8	1,462	22	195	11	1,698	163
2002	14	1,289	68	59	20	1,450	136
2003	13	1,126	57	237	2	1,435	123
10-year avg.	18	1,176	59	120	6	1,380	130

Source: Pacific Salmon Commission's Transboundary Technical Committee *Preliminary Estimates of Transboundary River Salmon Production, Harvest and Escapement and a Review of Joint Enhancement Activities in 2003*, February 2004.

The economic value of the personal use fishery has never been quantified; however, applying a substitution value of $5.00/pound based on the cost of substitute foods at retail stores, the ten-year average harvest of 1,380 salmon is worth approximately $44,000 annually.

In 2003, sport fisheries in the Juneau area harvested significant numbers of chinook and coho salmon originating from the Taku River. The percentage of chinook salmon from the Taku River has ranged from 56 to 93 percent of the total spring sport catch volume from the Juneau area since 1994, a ten-year average of 73 percent. Taku River chinook account for a significant portion of the total catch from Juneau waters. For example, in 2002 Taku River chinook accounted for 44 percent of the salt water king harvest in the Juneau area, excluding the catch from terminal harvest areas, according to ADF&G data.[1]

In some years the Taku River can contribute in excess of 50 percent of the coho salmon harvested in the Juneau recreational fishery. Since 1994, Taku River cohos have accounted for between 16 and 66 percent of the total sport catch in the Juneau area, a ten-year average of 34 percent. The annual average of sport caught fish attributable to the Taku River was 2,669 chinook and 8,345 coho.

[1] The 2002 Juneau area king salmon harvest in the area from Doty Cove to Berners Bay and west to Pt. Retreat is 5,415 fish. This excludes the catch from the terminal harvest area.

Table 9
Summary of Sport Caught Taku River Salmon in the Juneau Area, 1994-2003
(in numbers of fish)

Year	Taku Chinook	Taku Coho	Total
1994	3,213	24,382	27,595
1995	2,225	10,073	12,298
1996	4,602	3,155	7,757
1997	5,017	6,363	11,380
1998	2,088	5,677	7,765
1999	2,408	5,346	7,754
2000	1,553	5,303	6,856
2001	1,437	3,967	5,404
2002	2,399	8,514	10,913
2003	1,748	10,669	12,417
Annual average	2,669	8,345	11,014

Note: The 2003 coho harvest volume is preliminary ADF&G data.
Source: ADF&G, *Stock Status and Escapement Goals for Coho Salmon Stocks in Southeast Alaska*, (Special Pub. No. 03-02), February 2003.

Placing a dollar value on the sport harvest of Taku River salmon is difficult at best. Nevertheless, by making some broad assumptions about the per fish value of a Taku River fish, it is possible to derive an order-of-magnitude estimate.

According to a 2001 US Fish and Wildlife survey, US residents spent $537 million on sport fishing in Alaska (this total does not include sport fish related spending by non-US citizens visiting Alaska which account for a very small share of total sport fishing activity).[2] A study conducted by the University of Alaska found that about 20 percent of sport fishing related spending occurs in Southeast Alaska.[3] This suggests that Southeast Alaska sport fishing related spending totaled approximately $100 million in 2001.

Research conducted for the ADF&G indicates that in Southeast Alaska approximately 34 percent of sport fish effort targets chinook salmon and about 17 percent targets coho, based on number of fishing trips.[4] Applying these percentages to total regional spending suggests that chinook salmon related spending totaled about $34 million and coho related spending totaled about $17 million in 2001.

In 2001, sport fishermen harvested 78,000 chinook in Southeast Alaska, and 321,000 coho.[5] Dividing these harvest volumes into the chinook and coho spending estimates indicates that annual average sport harvest of Taku chinook and coho accounts for about $1.5 million in annual spending. Obviously, this is an imprecise methodology. However, it at least provides an indication of the level of activity associated with the Taku River salmon sport harvest. It should also be stated clearly

[2] A University of Alaska survey found that sport fishermen spent $540 million in Alaska in 1993. See *Economics of Sport Fishing in Alaska*, prepared by the Institute of Social and Economic Research, December 1999, for more information.
[3] Ibid, page 12.
[3] *Southeast Alaska Sport Fishing Economic Study*, prepared by Jones & Stokes Associates, Inc. for ADF&G, December 1991.
[4] Alaska Department of Fish and Game, Sport Fish Division.

that the information presented here cannot be used to predict the economic consequences of resource allocation shifts between user groups. Changes in the commercial and sport harvest would have very different marginal economic effects. Based on an estimated $1.5 million on sport fish related expenditures, the total economic impact of sport fishing including direct, indirect and induced effects are approximately 40 jobs, $700,000 in labor income, and $2 million in total economic output.

BC Commercial In-River Harvest

Canadian fisheries for Taku River salmon include a commercial gillnet fishery (and the commercial test fishery) located in the river near the Alaska-Canadian border, an aboriginal fishery (set gillnet), and a sport fishery. There are 16 commercial licenses, eight of which are communal First Nations licenses held under an Aboriginal Fisheries Strategy (AFS) agreement. Only two of the eight communal licenses are actively fished at the current time.

The sockeye fishery usually commences the second or third week of June through September. Chinook may be taken in the commercial fishery as an incidental catch in the directed sockeye fishery. This policy may change in the future to allow a directed chinook fishery if both the US and Canada consent; however, a recent meeting to discuss the directed chinook fishery did not result in an agreement between the two countries. During the sockeye fishery there is no limit on the number of coho that can be incidentally caught on the Canadian side of the border, and 3,000 to 10,000 cohos can be taken in a directed coho fishery depending on run size. Poor market conditions resulted in limited harvesting effort in 2003. Due to conservation concerns chum salmon cannot be retained by Canadian fishermen. No pink salmon were retained in recent years. Table 10 shows the number of fish harvested in the Canadian commercial and commercial test fishery since 1994.

Table 10
Salmon and Steelhead Catch in the Canadian Taku River Commercial Fishery and Commercial Test Fishery, 1994-2003 (in numbers of fish)

Year	Jack Chinook	Large Chinook	Sockeye	Coho	Pink	Chum	Steelhead	Total
1994	235	2,065	28,762	14,531	168	18	232	46,011
1995	298	1,577	32,640	13,629	2	1	205	48,352
1996	144	3,331	41,665	5,028	0	0	98	50,266
1997	84	2,731	24,003	2,594	0	1	160	29,573
1998	227	1,107	19,038	5,090	0	2	176	25,640
1999	259	1,485	20,769	5,104	0	0	129	27,746
2000	174	2,888	28,328	5,105	0	0	211	36,706
2001	347	2,633	47,907	2,599	0	0	3	53,489
2002	646	2,872	31,571	3,114	0	0	11	38,214
*2003	944	3,297	32,757	3,227	0	0	34	40,259
10-yr. avg.	336	2,399	30,744	6,002	17	2	126	39,626

Note: * 2003 data is preliminary.
Source: Pacific Salmon Commission Transboundary Technical Committee, *Preliminary Estimates of Transboundary River Salmon Production, Harvest and Escapement and a Review of Joint Enhancement Activities in 2003*, February 2004.

The ex-vessel value of Taku River salmon harvested in the Canadian fishery is estimated by year in Table 11. In the absence of data specific to the Canadian Taku River fishery, value is based on the Southeast region average fish size, multiplied by the region average price per pound specific to the drift gillnet fishery.

Table 11
Estimated Ex-Vessel Value of Canadian Taku River Commercial Harvest, 1994-2003

Year	Jack Chinook	Large Chinook	Sockeye	Coho	Pink	Chum	Steelhead	Total
1994	$700	$30,900	$252,500	$85,700	$100	$0	$1,600	$371,500
1995	$1,000	$21,800	$234,900	$76,200	$0	$0	$1,200	$335,100
1996	$400	$50,900	$313,400	$19,500	$0	$0	$500	$384,700
1997	$200	$41,900	$135,100	$12,700	$0	$0	$900	$190,900
1998	$500	$12,000	$130,400	$23,600	$0	$0	$800	$167,300
1999	$800	$19,300	$163,600	$21,400	$0	$0	$700	$205,700
2000	$500	$35,000	$179,500	$22,600	$0	$0	$1,200	$238,700
2001	$700	$28,900	$282,500	$7,600	$0	$0	$0	$319,700
2002	$800	$17,000	$156,000	$8,800	$0	$0	$0	$182,700
2003	$1,600	$27,800	$193,800	$11,200	$0	$0	$100	$234,500
10-year avg.	$700	$28,500	$204,100	$28,900	$0	$0	$700	$263,100

Source: Pacific Salmon Commission's Transboundary Technical Committee *Preliminary Estimates of Transboundary River Salmon Production, Harvest and Escapement and a Review of Joint Enhancement Activities in 2003*, February 2004.

The ex-vessel value of Taku River fish has ranged between $167,000 and $385,000 annually since 1994. The ten-year average is about $263,000. This represents the value paid to the fishermen. Almost 83 percent of this value was from the sockeye harvest in 2003.

The total direct economic activity from the Canadian commercial Taku River fishery is the first wholesale value of Taku River salmon, which includes the ex-vessel value paid to fishermen. The regional ex-vessel and first wholesale value per pound for Southeast Alaska salmon has been applied to the harvest volume to determine the estimated value of the commercial fishery and related processing activity. This activity has been between $478,000 and $1 million since 1994. The ten-year average first wholesale value is approximately $734,000.

Table 12
Estimated First Wholesale Value of Canadian Commercial Harvest of Taku River Salmon, 1994-2003

Year	Jack Chinook	Large Chinook	Sockeye	Coho	Pink	Chum	Steelhead	Total
1994	$2,000	$83,000	$553,400	$248,800	$700	$200	$4,500	$892,600
1995	$2,400	$53,700	$515,700	$207,500	$0	$0	$3,300	$782,500
1996	$1,000	$122,100	$819,300	$71,500	$0	$0	$1,800	$1,015,800
1997	$600	$101,200	$484,100	$39,100	$0	$0	$2,900	$627,800
1998	$1,500	$35,200	$360,700	$77,800	$0	$0	$2,700	$477,900
1999	$2,100	$54,500	$423,900	$72,700	$0	$0	$2,400	$555,700
2000	$1,700	$124,100	$498,600	$73,500	$0	$0	$3,800	$701,600
2001	$3,100	$121,900	$670,800	$28,300	$0	$0	$0	$824,200
2002	$4,300	$87,200	$498,700	$31,500	$0	$0	$100	$621,800
2003	$7,500	$129,800	$573,600	$42,300	$0	$0	$400	$753,700
10-year avg.	$2,300	$88,800	$545,400	$94,700	$100	$0	$2,300	$733,600

Source: McDowell Group estimate based on ADF&G harvest volumes, the ex-vessel prices for gillnet salmon and first wholesale value from the ADF&G Commercial Operator's Annual Report (COAR) database.

BC Sport Harvest

Recreational catch figures in the Canadian Taku River sport fishery are not available but have been estimated at 300 chinooks annually. Due to the low volume of this fishery, it has not been included in the summary valuation of Canadian Taku River fisheries.

BC Aboriginal Fishery

Canadian fisheries allocation policy requires that after conservation needs are met, First Nations food, social, and ceremonial (FSC) requirements and treaty obligations have first priority in the allocation of any harvestable surpluses. There are four First Nation licenses held under an Aboriginal Fisheries Strategy (AFS) agreement. This fishery allows individuals to harvest salmon for food and to sell a part of their harvest if they choose to do so. Gear consists of drift and set gill nets.

A Communal Fishing License allows for a harvest of up to 500 chinook salmon, 2,000 sockeye, and 750 coho. Taku River chum stocks have been depressed in recent years and chum salmon must be released. Pinks are caught incidentally during the sockeye fishery. Due to market conditions, most pinks are released. Table 13 shows the Canadian aboriginal fishery harvest for the last five years. Applying a substitution value of $5.00/pound based on the cost of substitute foods at retail stores, the ten-year average harvest of salmon in the Canadian aboriginal fishery is worth approximately $29,000 annually.

Table 13
Salmon and Steelhead Catches in the Canadian Taku River Aboriginal Fishery, 1994-2003 (in numbers of fish)

Year	Chinook	Sockeye	Coho	Chum	Steelhead	Total
1994	119	239	162	4	0	525
1995	70	71	109	0	7	261
1996	63	360	24	0	0	447
1997	103	349	96	0	0	548
1998	60	239	0	0	0	299
1999	50	382	471	0	0	903
2000	50	140	342	0	0	532
2001	125	210	500	25	5	865
2002	37	155	688	0	9	889
2003	277	267	416	0	0	960
10-year avg.	95	241	281	0	3	623

Source: Pacific Salmon Commission's Transboundary Technical Committee *Preliminary Estimates of Transboundary River Salmon Production, Harvest and Escapement and a Review of Joint Enhancement Activities in 2003*, February 2004.

Taku River Branding Efforts

The Taku River Tlingit First Nation operates a commercial salmon fishery on the Taku River. Some local employment is provided to fishermen from this harvest, and the finished smoked salmon products are being marketed under the brand name Taku Wild. The company's smoked salmon is held in cold storage, and processed and packaged in Juneau, though plans have been discussed to build a facility in Atlin.

The summer of 2003 was the first large scale harvest and production season for Taku Wild. Approximately 20,000 pounds of head and gutted sockeye were brought to Juneau and about one half of that has been processed to date. After smoking the fish, Taku Wild uses a special retort pouch packaging method of preservation that allows for a shelf life of up to six years with no need for refrigeration. The majority of the finished product is sold wholesale with some retail sales through the Taku Wild website. An eight-ounce retort package of sockeye retails for approximately $13.72 US. The total value of the 2003 retort production is approximately $62,000 US. The value of this production is included in the first wholesale value of the Canadian commercial fishery. (See Table 12.)

As Alaska's salmon industry becomes more specialized and adapts to reach higher value markets, other branding efforts will likely develop in the area. One such branding effort is currently being developed in Juneau under the label Taku River Reds.

Recreational Activity

The natural features of the Taku River valley - the scenery and wildlife viewing, and the numerous opportunities for camping, and many other recreational activities in a wilderness area - attract a significant number of visitors to the area.

United States Forest Service cabins

There are three USFS cabins located in the Taku River valley - the West and East Turner Lake cabins and the Taku Glacier cabin. The cabins sleep six and rental is $35 per night.

West Turner Lake cabin is located on the east side of the Taku Inlet approximately 9 miles north of Greely Point. The cabin is located on Turner Lake, 0.8 miles from salt water and is accessible by a trail or floatplane. The East Turner Lake cabin is located approximately 20 miles east of Juneau on the east end of Turner Lake. Access is by float plane only. Taku Glacier cabin is located on the east side of the Taku River approximately 13 miles from Greely Point across from the Taku and Norris Glaciers. Access is by shallow draft boat or floatplane.

The following table shows the annual number of Forest Service cabin rentals in the Taku River area since 1999. Cabins were rented for 83 nights in 2003, significantly less than the five-year average of 154 nights. In 2003, cabin rental fees totaled $2,905, compared to an annual average of $5,383 since 1999.

Table 14
Cabin Rental History, 1999-2003
(in number of nights per year)

Year	Taku	West Turner	East Turner	Total
1999	32	104	91	227
2000	14	98	43	155
2001	28	84	53	165
2002	22	70	47	139
2003	6	63	14	83

Commercial Lodges

There are two tourist lodges located on the Taku River. The Taku Glacier Lodge is a commercial restaurant lodge offering flightseeing and a salmon bake during the summer season; overnight lodging is not offered. Approximately 13,000 visitors visited the lodge in 2003. The flightseeing component is the most significant economic activity generated by the Taku Glacier Lodge, and totals have been

included in the air activity section. The Taku Sportfish Lodge on the Taku River watershed is operated by Taku Safari, a Canadian hunting guide company. Three and six-day sport fishing packages on the Taku River with lodging and air transportation from Whitehorse costs between $2,000 and $3,000 per person. Visitor volumes were not released by this operator for confidentiality reasons.

Commercial Aircraft Activities

The scenic value of the Taku watershed is very high as evidenced by the amount of air activity in the area. Aircraft activity in the area can be separated into two categories – flightseeing and charter business. Flightseeing tours over the Juneau Icefield, primarily in the high use areas of Taku and Norris glaciers where a significant portion of helicopter landing tours take place, are available onboard helicopters or fixed wing planes. Almost all of the flightseeing activity in the Taku River area occurs during the summer tourist season between May and September. Four helicopter operators and two operators of fixed-wing aircraft account for most of the flying activity.

Charter business in the area includes travel to and from Juneau and Atlin, flightseeing, remote sport fishing and hunting charters, and by people visiting recreational cabins, and a small amount of business occurs year round for the USFS.

Helicopter Flightseeing Tours and Glacier Landings

Four helicopter companies are permitted to provide commercial helicopter tours on and immediately next to the Juneau Icefield during the summer tourist season. In addition to flightseeing and icefield landing tours, helicopter companies work in partnership with other outfitters and guides to offer participatory activities including dogsled mushing, icefield hiking, icefield trekking, icefield Nordic skiing tours, and icefield snowmachine expeditions. The duration of these icefield activities ranges from a few hours to several days. Almost all of the helicopter landing tour participants are cruise ship passengers.

ERA Helicopters is permitted by the USFS to operate on the Norris and Taku Glaciers. ERA operates two glacier landing tours and a dog sled tour in the area of the Taku River. One tour lasts a total of about an hour, and features a brief landing either on the Taku or Norris Glaciers. A glacier trekking tour with more extensive time on the glaciers operates in the same area. Coastal Helicopters Inc. carries visitors to the Taku and Norris glaciers. Coastal offers glacier landings combined with dogsled mushing. TEMSCO Helicopters Inc. operates some glacier landing tours and Northstar Trekking LLC offers three levels of helicopter sightseeing/trekking in the Taku area.

There is one helicopter charter company in Atlin that offers flightseeing tours in addition to charters for business purposes. Actual passenger volumes were not available from this operator; the annual volume of flightseeing tours is assumed to be small in comparison to the air activity in Juneau and has not been included in the estimates.

Fixed Wing Flightseeing

Air Excursions flies a small amount of on-demand flightseeing tours during the summer. Wings of Alaska offers flightseeing in the Taku area. Wings Airways also provides transfers to the Taku Lodge with a flightseeing component. Additional companies that provide flightseeing as a relatively small part of their overall operations include Alaska Seaplanes, Haines Air, and LAB Flying Service.

There are approximately three fixed wing charter operators in the Atlin area. Passenger volumes were not available for these companies.

Charter Business

In addition to their flightseeing tours, Coastal Helicopters Inc. also operates charters to the Taku area. TEMSCO Helicopters Inc. does charter business with the USFS in the Taku area. AK Seaplane Service typically flies to the Taku area a twice a year on charter flights.

Commercial Air Summary

There were approximately 60,750 visitors who participated in some type of flightseeing or glacier landing tour in the Taku River area in 2003. The average price of all air tours was approximately $220 per person. Including other charter flights, the approximate retail value of all commercial aircraft activity in the area was approximately $13 million in 2003. Based on IMPLAN analysis, the total economic impact including multiplier effects of commercial air activity was 150 jobs, $5.5 million in labor income, and $18 million in total economic output.

Hunting Activities

The remoteness of the Taku River wilderness area has contributed to stable populations of large mammals including moose, caribou, mountain sheep, mountain goats, grizzly bears, and black bears. Many of these species are hunted by members of the TRTFN and are part of the subsistence economy of Atlin. Some sportsmen visit the Taku River area on both guided and unguided hunts.

Mountain goat

On the Alaska side of the border, ADF&G estimates an average of four mountain goats are harvested annually by an average of 11 hunters in the mountainous areas above the Taku River. Total effort for the ten-year period from 1994 to 2003 was 303 hunter days, for an average of 2.7 days of effort per hunter. Almost all mountain goat hunting takes place in August, September and October, with September as the busiest month. Access to mountain goat hunts begins by floatplane or boat. Ninety percent of goat hunters are residents of Alaska. The few non-resident hunters are most likely second degree kindred of residents and can therefore legally hunt without a guide. While possible, there are few if any professionally guided hunts for mountain goats in this area. Based on an average daily expenditure of $211, hunters

spend approximately $7,000 annually on non-guided mountain goat hunts in the Taku River area on the US side of the border.

The BC Ministry of Environment Wildlife Branch reports an average of 2 mountain goats harvested annually by guided non-resident hunters on the Canadian side of the border. These guided hunts are worth approximately $15,000 annually.

Moose

On the US side of the border, approximately 45 moose were harvested annually by an average of 82 hunters between 1993 and 2002. Total effort for the ten-year period was 3,061 hunter days for an average of just under four days of effort per hunter. Professionally guided hunts for moose in the US Taku River area are nearly non-existent. Based on an average daily expenditure of $211, hunters spend approximately $52,000 annually on non-guided hunts on the US side of the Taku River.

There is some resident harvest of moose on the Canadian side of the border. According to data from the BC Ministry of Environment, residents harvest an average of two moose annually from the Taku River area. A recent study for the Environmental Assessment Office of British Columbia analyzed the replacement value of several traditional foods based on the cost of substitute foods at retail stores in Atlin. Adjusted for inflation and expressed in US dollars, the replacement value of these moose is approximately $5,500 annually.[6] Non-residents have harvested an average of four moose per year in the Canadian Taku area on guided hunts since 1994. Based on interviews with area hunting guides, the approximate total cost of these guided hunting packages is estimated at $31,000 annually.

Bear

Approximately 6 black bears have been harvested by 6 hunters annually between 1993 and 2003 on the US side of the Taku River area. Total effort for the ten-year period was 145 hunter days for an average of just over 2 days of effort per hunter. Seventy percent of hunters were residents. Non-resident hunters are not required to hire a guide. Seventy percent of the harvest takes place during the spring season while the other thirty percent takes place in the fall. Based on an average daily expenditure of $211, hunters spend approximately $3,800 annually on non-guided hunts on the US side of the Taku River.

According to the Canadian Ministry of Environment, there has been no resident harvest of black bear or grizzly bear on the Canadian side of the border since 1994. There was an average of two black bears and two grizzly bears harvested by guided non-resident hunters annually during this period. Hunters spend approximately $38,800 on guided packages annually on the Canadian side of the Taku River.

[6] Staples, L. *Determining the Impact of the Tulsequah Chief Mine Project on the Traditional Land Use of the Taku River Tlingit First Nation*, Environmental Assessment Office, Province of British Columbia, August 1997. The replacement value of moose was calculated to be between $9 and $15 per pound in 1997 Canadian dollars (adjusted to $10.40 to $17.30 US dollars in 2004); the average weight harvested from each moose was assumed to be 400 pounds.

Small game

There is a small amount of trapping for beaver, mink, marten, otter, and wolf. Most of the trapping likely occurs on the shoreline closest to Juneau and near the private cabins up river. Ptarmigan and grouse are hunted upland from the river, while ducks and geese are harvested along the river.

Hunting Activity Summary

Hunters spend approximately $65,000 annually on hunts in the Taku River area on the US side of the border. The Canadian harvest of game from the Taku River area is estimated to be worth approximately $90,300 annually. Including the replacement value of some traditional foods, average daily expenditures on non-guided hunts, and the typical cost of guided hunting packages, hunting activities in the Taku River area on both sides of the border are worth approximately $155,300 annually.

Rafting, Canoeing, and Kayaking

There are several wilderness guiding companies that offer rafting, canoeing and kayaking trips along the Taku River. These river excursions are typically 10 to 14 days in length and cost an average of $3,000 per person. Groups meet in Juneau or Whitehorse and travel by small plane to Atlin to begin their trips. Approximately 80 people participated in guided trips on the Taku River in 2003, spending an estimated $240,000 on trip packages. Additional spending is likely for guests who spend days in Atlin or Juneau independent of their river excursions. Most companies offer a ratio of 1 guide for every 4 guests. Employment associated with this passenger volume was approximately 20 guides. Guiding companies that offered trips on the Taku River in 2003 include:

- Equinox Wilderness Expeditions – Anchorage, AK
- Nahanni River Adventures – Whitehorse, Yukon
- Rivers Oceans and Mountains (ROAM) – Nelson, BC
- River League Wilderness Rafting Expeditions – Vancouver, BC
- Canadian River Expeditions – Williams Lake, BC

Tulsequah Chief/Big Bull

Mine sites known as the Tulsequah Chief and Big Bull are located about 100 kilometers south of Atlin, British Columbia on the east side of the Tulsequah River about 10 kilometers north of its confluence with the Taku River. The Tulsequah Chief was discovered in 1925. Cominco purchased the claim in 1946. The deposit has concentrations of gold, silver, copper, lead, zinc, and cadmium.

The Big Bull mine site, located approximately 10 kilometers south of the Tulsequah site and closer to the Taku River, was operated in conjunction with the Tulsequah Chief mine from 1951 until 1957. The ore from both the Tulsequah Chief and Big Bull was combined and processed together during this period. From 1939 through its closure in 1957 the mine had produced a total of 580,256 metric tons from the Tulsequah Chief and 353,314 metric tons from Big Bull at a combined average grade of 3.77 grams per metric ton gold, 126.5 grams per metric ton silver with 1.59 percent copper, 1.54 percent lead and 7.0 percent zinc.

The mine site is currently owned by, and is the primary asset of, Redfern Resources Ltd., a Canadian company. Redfern began field work in NW British Columbia in the early 1980s and identified several potential claims in the area of the Cominco Tulsequah Chief mine. From 1981 to 1992 Redfern worked in partnership with Cominco to identify areas of high quality mineralization at the site. In 1992 Redfern purchased Cominco's interest and is now the sole owner of the Tulsequah Chief project.

A 1997 feasibility study update concluded that the Tulsequah project was feasible. The study estimated a total pre-production capital cost of CAN$148 million for a 2,466 metric ton/day production rate with an operating cost of $59/metric ton of ore. The diluted probable reserve was calculated to be 7.6 million metric tons, containing 2.51 grams per metric ton gold and 105.25 grams per metric ton silver with 1.32 percent copper, 1.23 percent lead, and 6.63 percent zinc. Total reserves are estimated to be approximately 728,000 ounces of gold and 30,920,000 ounces of silver. The mine is projected to employ 200 people for a mine life of 9 years.

The project feasibility is based on developing 177 kilometers of new road and upgrading 45 kilometers of existing road from Atlin to the Tulsequah site. The ore will be crushed and processed on site.

Redfern received a Project Approval Certificate in 1997 and a Special Use Permit for road development in 1999. The project was challenged by the Taku River Tlingit First Nation, resulting in a BC court stopping the project. After several years of judicial review, a new Project Approval Certificate was awarded to Redfern in December 2002. The project is still under environmental review by the Canadian federal government, which must grant several key permits before the mine can

proceed. The matter is now before the Canadian Supreme Court with a ruling expected this October.

At this time the BC approval is in place and federal approval and permits are still needed before for Redfern to begin site work. There has been no announcement from the company concerning start up. It is probable that Redfern is working to secure investors. Prices for gold, silver and copper have improved in 2003 and 2004 increasing the economic feasibility of the mine.[7]

The Tulsequah would be supplied and otherwise supported primarily through BC rather than Juneau. Skagway would offer the deepwater nearest to the mine and therefore could realize some economic activity associated with movement of supplies to the mine and export of ore concentrates to smelters.

New Polaris

The Polaris Taku mine located about 6 kilometers south and across the Tulsequah River from the Tulsequah site operated from 1937 to 1951. Currently the site, re-named the New Polaris, is being examined by Canarc Resource Corporation. Work on the project has been ongoing since 1996. Recent estimates show a gold ore reserve of 3.3 million metric tons grading 13.7 grams of gold per ton. Development of the mine depends on the outcome of orebody evaluation work and would be at least several years in the future, if the project appears feasible. Canarc Resource Corporation acknowledges that the project would benefit in terms of feasibility if the Tulsequah Chief goes ahead; the company would likely use the same road. Benefits would therefore accrue largely to BC rather than Juneau.

[7] Source: Redfern Resources website redfern.bc.ca/projects

Annex Creek Hydro Project

The Annex Creek Hydroelectric Plant is located at Annex Creek, on the west side of Taku Inlet approximately seven miles north of Point Bishop. The site for the Annex Creek Power House was developed in 1915. Annex Creek Lake, a 264-acre lake about 800 feet above sea level, forms a natural reservoir from which water flows through a tunnel to a power house. The plant's average annual production of electrical energy is about 26 GWH, about 10 percent of the annual power needs for the City and Borough of Juneau.[8]

[8] AEL&P website, history section.