Review of the Yukon Placer Authorization (YPA)

What is the YPA?

Under the federal Fisheries Act, the Yukon Placer Authorization (YPA) is a Policy Directive that accompanies the Yukon Waters Act. Under Section 35(2) of the Fisheries Act, the YPA authorizes the alteration, disruption, or destruction of fish habitat of certain Yukon streams, or portions of streams, by placer mining.

The YPA was developed in 1993. It only applies to Yukon placer mines. The YPA is a lower standard for protecting fish, fish habitat and water quality than anywhere else in Canada, Alaska, Montana, Washington, Oregon or New Zealand.

A public review of the YPA is to be completed by November 1, 2001.

Why is the YPA being reviewed?

Placer operations mine gold in nuggets and dust particles from the bottom of rivers and streams, as well as the creek valleys. The YPA was introduced as a *temporary measure* to allow placer mines to carry out activities that harmfully affect water quality and fish habitat and which therefore would normally be prohibited under the Fisheries Act. **Experience internationally now shows that responsible placer mining practices and technology can avoid these harmful effects.**

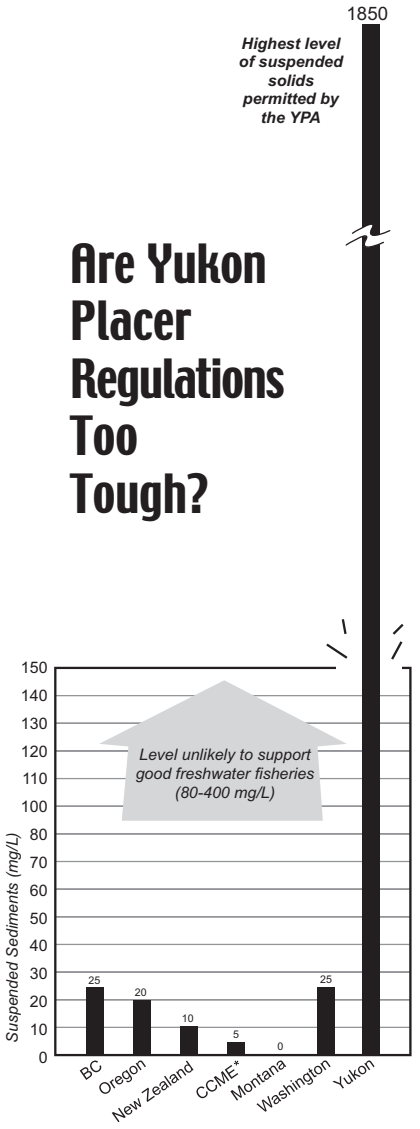
The YPA was written before the Canadian Environmental Assessment Act (CEAA), but states that compliance with the YPA "is considered to be adequate mitigation with respect to CEAA"[1] . CEAA requires environmental assessment to include consideration of adverse impacts and cumulative effects. By saying that CEAA do not apply to placer mines, the YPA has stopped the process which allows public concerns about the harmful environmental impacts to be voiced. Since the YPA was written before CEAA, the YPA policy and cumulative effects of placer mining should be reviewed and updated to meet the criteria of CEAA.

With our downstream neighbours, the state of Alaska, declaring the Yukon River to be in a state of disaster emergency due to very low salmon returns (significantly less than 50% of the 21 year average), it is time to modernize our views on fish health and habitat protection. To achieve this and the level of fish protection expected under the Fisheries Act, the YPA needs to change:

1. To lower the sediment levels allowed in placer mine effluent discharge
2. To require monitoring of metal levels in placer mine effluent discharge
3. To no longer allow the deferment of fish habitat for use as placer mines
4. To no longer allow in-stream works which destroy fish habitat and impact water quality
5. To require exploration to prove that the value of gold in the proposed placer mining area is sufficient to off set the harm to water quality and fish habitat and to ensure that there will be funds available to restore damaged fish habitat.

[1] Yukon Placer Authorization, 1993, page 20.

Are Yukon Placer Regulations Too Tough?



Sediment Levels (mg/L) vs. Regional Regulations

**Canadian Council fo the Ministers of the Environment suspended sediment level standards for longer than one day.*

To participate in the review call the Yukon Conservation Society for more information. Contact: Sue Moodie, (867)668-5678

Yukon Conservation Society

Introduce Standards For Metals Discharged by Yukon Placer Mines

The YPA allows the discharge of sediment in amounts higher than usually allowed under the Fisheries Act as long as they are "uncontaminated by metals or toxic chemicals above natural background levels" [1].

# of Alaskan placer mines sampled in 1997 by EPA[2] to investigate changes in metal concentrations due to placer activities: ***31***

# of Alaskan placer mines in the 1997 EPA study[3] for which metals concentrations (selenium, lead, mercury, zinc etc.) increased in both the effluent and mixing zone waters compared to background streams: ***31***

# of Alaskan placer mines sampled in 1997 by EPA[4] which exceeded the Alaska water quality chronic criteria for total recoverable lead: ***30***

% of Yukon hard rock mines that monitor their effluent for metal concentrations: **100%**

% of Alaskan placer mines that are required to monitor their effluent for metal concentrations: **100%**

% of Yukon placer mines that monitor their effluent for metal concentrations: **0%**

Macroinvertebrates (stream bottom-dwelling bugs) are capable of concentrating metals under chronic exposure conditions (long term). Studies show increased mercury, zinc, molybdenum and arsenic in macroinvertebrate tissues in the mined compared to the un-mined Alaska creeks[5]. Juvenile chinook salmon eat these bugs as the main part of their diet, so if the bugs are harmfully affected by metals the young salmon will be impacted as well.

Slimy sculpins are found in most Yukon streams. They are an important food source for larger fish and birds. They are also very sensitive to the negative effects of metals on their health.

To participate in the review call the Yukon Conservation Society for more information. Contact: Sue Moodie, (867)668-5678

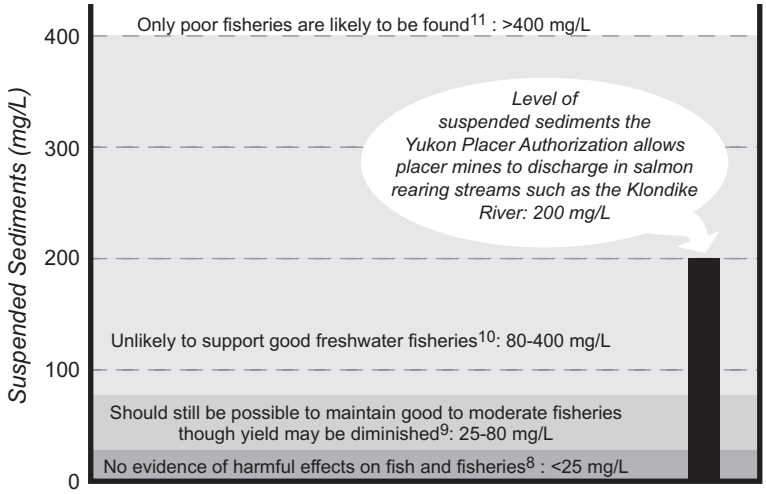
Yukon Conservation Society

[1] Yukon Placer Authorization, revised November 1998, page 3
[2] US EPA. April 10, 1998. Alaska Placer Mining Metals Study. Prepared by U.S. Environmental Protection Agency, Office of Environmental Assessment, Region 10. EPA910-R-98-003
[3] US EPA. April 10, 1998. Alaska Placer Mining Metals Study. Prepared by U.S. Environmental Protection Agency, Office of Environmental Assessment, Region 10. EPA910-R-98-003
[4] US EPA. April 10, 1998. Alaska Placer Mining Metals Study. Prepared by U.S. Environmental Protection Agency, Office of Environmental Assessment, Region 10. EPA910-R-98-003
[5] Prussian, Aaron, Todd Royer and Wayne Minshall. 1997-98. Impact of suction dredging on water quality, benthic habitat, and biota in the Fortymile River, Resurrection Creek and Chatanika River, Alaska. Prepared for EPA, Region 10. Prepared by Idaho State University.

Raise Sediment Standards to Protect Fish & Fish Habitat

The sediment standards in the Yukon Placer Authorization (YPA) are based on a 1964 technical paper[1] that never envisioned the technology or flocculants that can currently be used by responsible placer mines. The research of 1964 also did not predict the large scale placer mines could grow to be or the serious dwindling of Yukon River salmon populations we have witnessed in recent years.

Impacts to Fish and Fish Habitat?



How long have we known?

 # years ago that the European Inland Fisheries Advisory Committee (EIFAC)[12] described the harmful impacts of suspended sediments to a fishery, such as negatively affecting fish survival, growth rate, resistance to disease, fish egg and larval development, natural movement and migrations, and the availability and abundance of food for fish: ***37***

 # years ago the Yukon Placer Authorization was written: ***8***

# of new fisheries research studies showing that the findings of the EIFAC in 1964 about the impact of suspended sediments on fish and fish habitat were wrong: ***0***

# of chinook salmon crossing into Canada in 1989: ***42,620***

# of chinook salmon crossing into Canada in 2000: ***17, 215***

Conclusion:

Sediment levels that Yukon placer mines are allowed to discharge are extremely high. To ensure the protection of fish and fish habitat under the Fisheries Act, regulations must be set for placer mines at 0 mg/L of suspended sediment above background.

Level of settleable solids the YPA allows placer mines to discharge in salmon rearing streams compared to Alaska:
25 x higher

Range of suspended sediments proven acutely lethal to fish:
100 mg/L to 100,000mg/L

Range of suspended sediments proven longterm harmful (sublethal) to fish:
10 to 1000 mg/L

Level of suspended sediments allowed by the YPA compared to the level that impairs feeding activity and growth in juvenile Arctic grayling[6]:
18.5 x higher

% of Arctic grayling food supply available at suspended sediment levels of 63 mg/L[7]:
10%

Level of suspended sediments the YPA allows placer mines to discharge compared to level which is unlikely to sustain a fishery:
5 x greater

Level of suspended sediments the YPA allows placer mines to discharge compared to level which is likely to cause harm to fish:
74 x greater

% of juvenile chinook salmon previously unexposed to sediments showing a preference for clear water:
80%

To participate in the review call the Yukon Conservation Society for more information. Contact: Sue Moodie, (867)668-5678

Yukon Conservation Society

[1] European Inland Fisheries Advisory Commission, 1964
[2] Ministry of Environment, Lands and Parks. 1998. Ambient Water Quality Guidelines for B.C.
[3] Water Pollution, Division 41, Oregon Administrative Rules.
[4] New Zealand Ministry for the Environment. 1991. Resource Management Act.
[5] Montana Bureau of Mines and Geology. 1993. Montana Placer Mining: Best Management Practices for Planning, Erosion Control and Reclamation.
[6] Mcleay, D.J., I.K. Birtwell, G.F. Hartman, and G.L. Ennis. 1987. Responses of Arctic grayling (Thymallus arcticus) to acute and prolonged exposure to Yukon placer mining sediment. Can. J. Fish. Aquat. Sci. 44:658-673
[7] Scannell, P.O. 1988. Effects of elevated sediment levels from placer mining on survival and behavior of immature Arctic Grayling. University of Alaska, Fairbanks.
[8,9,10,11,12] European Inland Fisheries Advisory Commission, 1964

Assumptions of the Yukon Placer Authorization (YPA)_

The YPA is based on the following inaccurate assumptions:

1. The Yukon River watershed can support 300,000 chinook salmon, and the number in the salmon run in the early 1990's was 70,000, therefore not all the habitat of the Yukon River habitat was needed.

BUT Chinook salmon in the Yukon River are a mixed stock of fish that use the watershed in site specific ways. There are discrete stocks of salmon for each part of the Yukon River and its tributaries. A unique stock of salmon can be as little as 100 fish. The assumptions of the YPA ignore that destruction of water quality and fish habitat in specific locations may seriously harm certain sub-stocks of chinook salmon which only use those parts of the watershed. If the habitat is regenerated at a later date, there may be no survivors of the specific chinook salmon discrete stock to return to the habitat.

Hunker Creek before dredging

2. Chinook salmon are one stock that can use any part of the Yukon River watershed for spawning.

ACTUALLY, Chinook salmon population in the Yukon River are made up of many discrete stocks of chinook salmon. These are unique populations that have been identified due to distinct genetic characteristics common to fish born in a certain part of a stream. The behavior of each discrete stock is a strong tendency to return as an adult to that specific region of the watershed to spawn.

3. Chinook salmon are opportunistic species.

NOT REALLY. There is no proof that chinook salmon are opportunistic species or they can use other habitat if their usual patterns have been impacted. Evidence shows that although some straying may occur, chinook are usually very selective in their use of the Yukon River watershed; that is, they return to spawn at specific locations. Therefore, the harmful alteration and destruction of certain habitat locations will impact the chinook salmon that would have used that portion of the watershed to spawn.

Hunker Creek after dredging

4. Fish habitat destroyed by placer mining can be effectively restored.

HOWEVER, research shows only 18% of two year old restored stream channels will support fish.

5. Fish habitat destroyed by placer mining will be effectively restored.

BUT, habitat restoration is expensive and difficult to accomplish effectively. Yukon placer mines aren't currently required to put security money up front to pay for reclamation, so the work is often left undone.

6. Biological diversity is protected by setting standards to protect chinook salmon.

HOWEVER, other species in the aquatic ecosystem may be even more sensitive to levels of sediment and metals in the placer mine discharge. Fish that feed off the bottom of creeks such as slimy sculpins and benthic macroinvertebrates (creek bottom dwelling bugs) are known to have higher sensitivities to metals and increased tissue metal levels in impacted creeks[1]. Sculpins are known to be eaten by trout, northern pike, burbot and birds[2]. If sculpin populations decrease due to metals effects then the food source for these other species is decreased and may also introduce high metal content to their diet.

What happens now?

7. The maps in the placer authorization are a true representation of the locations of useable fish habitat and current use of the streams by fish at different life stages.

ACTUALLY, the streams were identified on maps and not in the field, so many of the streams were classified as fish habitat and yet are no longer running water. Local knowledge on a variety of streams show that they have been classified wrong. For example, the 40 Mile and Klondike River are know to be salmon spawning streams (Type I) but are classified as rearing streams (Type II). On the Klondike River, the Type II classification is further deferred, so instead of setting the regulation at 0 mg/L above background, the level is regulated at 200 mg/L.

8. One part of a stream can be altered without changing the other parts of the stream.

In the late 1800's, the United States Geological and Hydrological Survey conducted research which showed that changing stream flows on any part of a water system in turn changes the flows both upstream and downstream of the alteration.

9. Addressing cumulative effects for water quality also protects habitat from cumulative effects.

NO. The YPA makes some attempt to address cumulative impacts of sediment discharges from a number of mine sites in a watershed but this does not help to minimize the impacts to fish habitat. For example, the Indian River has been placer mined by different operations that did not integrate their plans and therefore there is no clear creek channel remaining for habitat restoration.

Conclusion:

The Yukon Placer Authorization can no longer be accepted as a tool for the protection of fish and fish habitat in the Yukon. Placer mining in the Yukon must start to achieve modern standards and mine using responsible methods that will protect chinook salmon and other fish in the Yukon River.

Mine reclamation:

Reclamation on Yukon streams is inadequate, and often not even initiated.

Miners should be required to complete reclamation within a certain time frame after mining activity ceases each year. When ground is mined, top soil should be kept aside for reclamation work to replace the soil on the re-contoured area.

Reclamation is often not initiated because the miner intends on returning to complete the mining and does not. For this reason, securities should be posted to ensure that reclamation work is completed. The sums should be sufficient to cover the higher costs of administration and work completed by a third party when the operator has not fulfilled reclamation responsibilities in a timely manner.

[1] Brown, C. J. D. 1971. *Fishes of Montana*. Big Sky Books, Mont. State University:Bozeman.
Carl, G. C., Clemens, W. A. and Lindsey, C. C. 1967. *The Fresh-water Fishes of British Columbia*. 4th Ed. British Columbia Provincial Museum, Victoria. Handbook 5.
Koster, W. J. 1937. The food of sculpins (Cottidae) in central NewYork. *Trans. Am. Fish. Soc.*, **66**:374-382.
Meyers, C. D. 1961. *Environmental Conditions Affecting the Distribution of the Slimy Sculpin (Cottus cognatus Richardson).* Master's thesis, Penn. State Univ., College Park.
Roger, P. B. 1971. *The Ecology of Two Species of cottids in Iliamna Lake, Alaska, and Their Relation to Sockeye Salmon.* Master's thesis, Univ. of Washington, Seattle.

[2] McPhail, J. D. and Lindsey, C. C. 1970. Freshwater Fishes of Northwestern Canada and Alaska. *Fish. Res. Board Bull.*, **173**.

To participate in the review call the Yukon Conservation Society for more information. Contact: Sue Moodie, (867)668-5678

Yukon Conservation Society

End Deferment of Fish Habitat & Water Quality

"Deferment" is permission to temporarily destroy the productive capacity fish habitat and water quality to facilitate placer mining[2]. For example, the Klondike River downstream of Hunker Creek is a Type II rearing stream which normally requires certain fish habitat and water quality standards. Under the YPA, these standards have been *"deferred"* to allow higher discharges of sediment (and thus lower fish habitat and water quality levels) from the placer mines on Hunker, Bear, and Bonanza Creeks[3].

The policy of allowing deferment is based on a number of unproven and faulty assumptions:

1. The only productive fish habitat is that of salmon.
2. Degradation of water quality will be short term.
3. Fish habitat will be fully restored to original productivity and health once the placer mining activity stops.
4. The stream classifications in the YPA are based on field fish investigations, including biological and physical data of creeks.

Actually:

1. Many fish other than salmon are important for Yukon peoples' food (for example, arctic grayling, whitefish, inconnu, cisco, burbot and pike). As well, smaller fish and creek organisms are important food for the health of these larger fish and wildlife so it is important to consider impacts on them as well.
2. Many placer mines remain un-reclaimed and can continue to impact water quality in streams long after the mining has stopped.
3. Creek restoration work is expensive and hard to carry out effectively. This means that even well intentioned work does not often manage to clean up a creek so that it will support the aquatic life that lived there before placer mining disturbances.
4. No field work was done on many of the streams in classified in the YPA and thus many are classified wrong. This means there are actually fewer viable creeks with good habitat, so deferring the protection on one based on the incorrect maps in the YPA may actually mean the destruction of the only good habitat creek in the area.

This policy is unique to the Yukon. Other juridictions manage to have successful placer mines without defering water quality and fish habitat.

When the YPA was first implemented in 1993, it was recognized *"that not all fish habitats may be needed to support existing fisheries although they are expected to be needed in the future"*[6]. We are now in the future and the fisheries need all the support they can get to survive. For this reason, the practice of deferring water quality and fish habitat can no longer be approved.

[1] Yukon Placer Authorization, 1993, page 14-15
[2] Yukon Placer Authorization, 1993, page 16
[3] Yukon Placer Authorization, 1993, page 9
[4,5] Prussian, Aaron, Todd Royer and Wayne Minshall. 1997-98. *Impact of suction dredging on water quality, benthic habitat, and biota in the Fortymile River, Resurrection Creek and Chatanika River, Alaska.* Prepared for EPA, Region 10.Prepared by Idaho State University.
[6] Yukon Placer Authorization, 1993, page 1

All of the streams in the Yukon have been classified into 5 classifications, according to their fisheries values[1]:

Type I - Salmonid* spawning streams

Type II - Salmonid* rearing streams

Type III - Streams with fish of significant use by First Nations, commercial, sport or domestic fisheries, or which contribute to biological diversity.

Type IV - Streams with no fish, no significant fish, or not contributing to biological diversity

Type V - unclassified streams

**salmonid includes salmon, trout and charr species*

Studies show that placer mining negatively impacts important food sources for juvenile salmon and other fish:

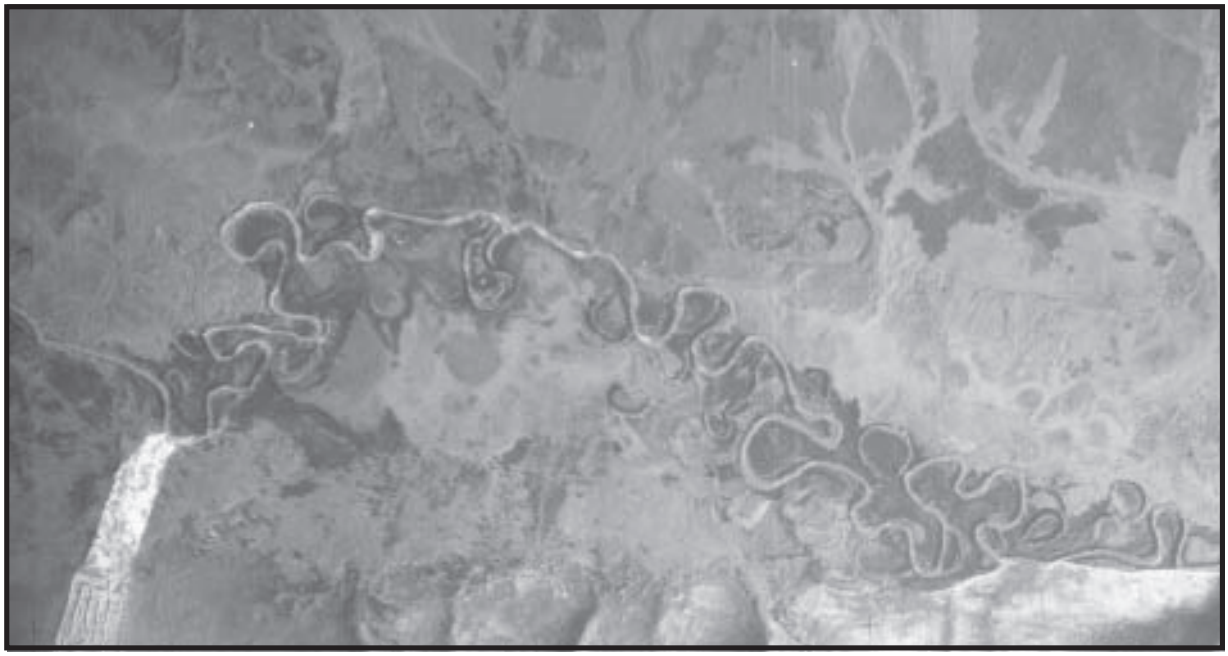
% reduction of macroinvertebrate abundance (# of creek bottom bugs) 10 metres downstream of a small scale dredge 1 year later[4]: **97%**

% reduction of macroinvertebrate diversity (# of kinds of creek bottom bugs) 10 metres downstream of a small scale dredge 1 year later[5]: **88%**

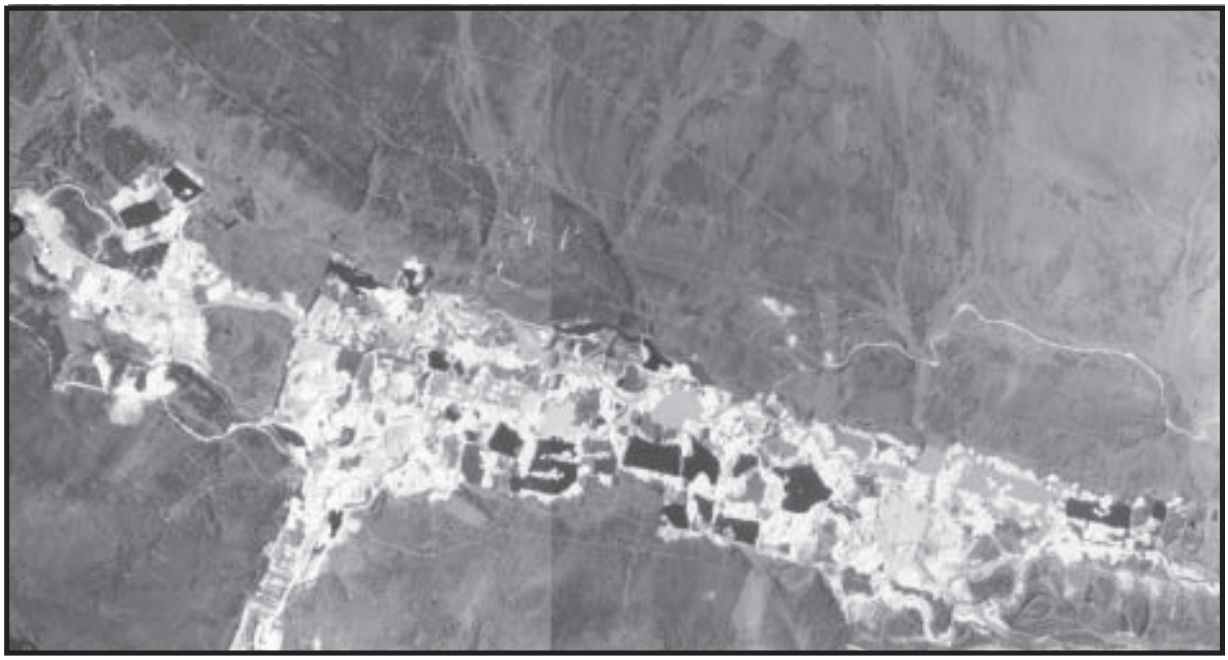
% of food source for juvenile fish that is from macroinvertebrate populations: **100%**

To participate in the review call the Yukon Conservation Society for more information. Contact: Sue Moodie, (867)668-5678

Yukon Conservation Society



Air photo of Indian River and Quartz Creek, 1944



Air photo of Indian River and Quartz Creek, 1995