Appendix II

Additional Information on Fish Species

Chum salmon

Chum salmon are anadromous salmonids that develop a dark horizontal stripe on their sides when spawning. They turn dark with reddish sides, and males also develop hooked jaws, canine-like teeth and a checkerboard or calico coloration when breeding. Adults can be 80 cm or more in length and weigh up to 10 kilograms (kg; DFO 2011a; Gwich'in Renewable Resource Board [GRRB] 2011). Chum salmon mature at between two and six years of age (Evans *et al.* 2002).

In North America, chum salmon are found in the Pacific Ocean and Beaufort Sea (DFO 2011a). Chum salmon move into the Peel and Mackenzie River systems to spawn (Evans *et al.* 2002).

Chum salmon only enter freshwater systems briefly to spawn. Rivers and lakes are used during spawning migrations, but spawning occurs in the fall in rivers only. From the Beaufort Sea, two spawning migrations take place, with those remaining in the NWT moving into the Slave River in October and November (Evans *et al.* 2002).

Spawning typically takes place in spring in ground-water fed streams or where upwellings occur over gravel (e.g., 2-3 cm diameter). The eggs are laid in a pit and covered, then the adults die. The eggs hatch under the ice and the alevins remain in the gravel for up to 90 days then begin their migration towards the sea. They remain at sea for three to five years feeding and growing, then adults return to their natal streams to spawn (Evans *et al.* 2002).

The diet of chum salmon includes insects and marine invertebrates while they are in rivers, and at sea consists of copepods, molluscs, squid, tunicates and other fish (National Oceanic and Atmospheric Administration 2011).

Chum salmon are food fish (GRRB 2011). There are no known management plans or agreements in place in the ISR for chum salmon. Their status is listed as Undetermined in the NWT (GNWT, ENR 2011c).

Pink salmon

Pink salmon are anadromous salmonids that, as they mature, develop a hump. They can weigh up to 3 kg (DFO 2011a). They typically live for two and sometimes three years (Evans *et al.* 2002)

Pink salmon are a Pacific salmon species that occur in small numbers in the Arctic in the Beaufort Sea. They have been found in the Mackenzie River system but are not know to spawn in the NWT. Pink salmon are anadromous and enter freshwater only to spawn, usually in their natal streams (Evans *et al.* 2002).

In Alaska and Russia, pink salmon migrate up-river between June and September, and spawning takes place in August or September. Spawning occurs in redds in clean coarse gravel which may have cobbles, sand and silt in riffles or below pools with water depths between 30 and 100 cm. Both adults die after spawning. The eggs hatch between December and February, and the young remain in the gravel until April or May when they move downstream to coastal areas for several months before moving out to sea (Evans *et al.* 2002).

Upon emerging from the gravel, the young enter estuaries and nearshone zones for days to months before moving into the ocean (DFO 2011a).

The diet of pink salmon includes zooplankton, particularly krill (DFO 2011a).

Pink salmon are human food fish. There are no known management plans or agreements in place in the ISR for pink salmon. Their status is listed as Vagrant / Accidental in the NWT (GNWT, ENR 2011c), but there have been several reports that pink salmon have been caught in the Mackenzie Delta (Babaluk *et al.* 2000).

Arctic Charr

Arctic charr are an anadromous member of the salmon family but land-locked populations exist in the ISR. Anadromous fish are the larger stocks, weighing up to 4.5 kg, while freshwater land-locked stock can weigh up to 2.3 kg. They may be deep blue or blue-green with silver on the sides and white bellies, and large, round typically violet-pink spots on their sides (DFO 2006). In their northern ranges, they may not reach maturity until 20 years of age (GNWT, ENR 2011c).

Arctic charr are distributed around the circumpolar north, but within the ISR occur to the east of the Mackenzie River, including in the Hornaday and Holman rivers (Community of Inuvik *et al.* 2008; Community of Tuktoyaktuk *et al.* 2008; DFO 2006). They may be found in freshwater, estuarine, and marine habitats and both anadromous and freshwater populations prefer cold water habitats (DFO 2004).

Spawning occurs in September or October over rocky shoals in lakes and also in rivers with gravel bottoms. Females dig redds in water 3 to 6 meters (m) deep and the eggs incubate under ice for approximately six months. After spawning, adults may remain for one winter in freshwater before migrating back to sea. The following spring the young charr leave the gravel but may remain in the river for five to seven years before going to sea (for anadromous species). For anadromous fish, Arctic char may migrate to sea at four to five years of age. The young spend time in freshwater and brackish areas of estuaries, but move into marine areas as they grow more tolerant, feeding in nearshore areas. For non-adromous fish, they remain in freshwater lakes and rivers for all life stages (DFO 2004).

Adults do not die after spawning, but may spawn again every two or three years throughout their lives. Adults move to their natal freshwater river system every year regardless if they spawn or not (DFO 2004).

The diet of young Arctic charr includes freshwater shrimp and insect larvae, and adults feed on small fish, snails, clams and insect larvae (DFO 2004)

Arctic charr are a subsistence food fish (DFO 2006) but are also important in the food chain as prey for other fish species and other predators (Community of Inuvik *et al.* 2008; Community of Tuktoyaktuk *et al.* 2008). They are classified as a game fish in the NWT (CanLII 2011b). There are no known management plans or agreements in place in the ISR for this species. Their status is listed as Secure in the NWT (GNWT, ENR 2011c).

Least Cisco

Least cisco have elongate bodies and are brown to olive green fish with a silvery underside. Their weak lower jaw projects beyond the upper jaw and they have large eyes. They may be to 23 cm in length in lakes, but up to 40 cm in the Mackenzie River and coastal areas. Least cisco become sexually mature at 6 to 7 years of age (GRRB 2011; Community of Inuvik *et al.* 2008; Community of Tuktoyaktuk *et al.* 2008) and they may live for up to 15 years (GRRB 2011).

Least cisco occur throughout the lower Mackenzie Delta in lakes and rivers, with the Mackenzie River tributaries as important spawning habitat. They migrate, but the migrations of coastal fish may be limited

to the plumes of their home river. Least cisco migrate upstream and spawn in October in clear streams over gravel substrates (Community of Inuvik *et al.* 2008; Community of Tuktoyaktuk *et al.* 2008).

The diet of the lake cisco includes crustaceans and fish (GNWT, ENR 2011c) as well as amphipods, mosquitoes, black flies and sandflies (GRRB 2011).

Least cisco are a subsistence food fish in the ISR (GNWT, ENR 2011c) and are also used for dog food (GRRB 2011). They are important in the food chain as prey for inconnu, pike, burbot and mammals and birds. They are classified as a game fish in the NWT (CanLII 2011b). There are no known management plans or agreements in place for the species in the ISR. They are considered abundant and are believed to provide an adequate supply of fish to the communities (Community of Inuvik *et al.* 2008; Community of Tuktoyaktuk *et al.* 2008). Its status is listed as Secure in the NWT (GNWT, ENR 2011c).

Freshwater Species

Note that many of the following fish classified as freshwater species in the ICCPs (Community of Inuvik *et al.* 2008; Community of Tuktoyaktuk *et al.* 2008) may also live during one or more of their life stages in marine and/or brackish water.

Arctic Cisco

Arctic cisco are silver-coloured fish with white pectoral and pelvic fins and a terminal mouth. They reach a maximum length of 50 cm and can live for up to 20 years (GRRB 2011; Community of Inuvik *et al.* 2008; Community of Tuktoyaktuk *et al.* 2008).

Arctic cisco range across Arctic Canada and Siberia. They are common in the Mackenzie Delta and its inland lakes (summer) and in harbours around Tuktoyaktuk (winter); being very saline-tolerant, they are able to migrate far from the Mackenzie Basin. Important habitats for the Arctic cisco include the Mackenzie River, its estuary, its tributaries (for spawning), and inland lakes, and overwintering and nursery areas include Inner Shallow Bay / Niakunak Bay and Kugmallit Bay (Community of Inuvik *et al.* 2008; Community of Tuktoyaktuk *et al.* 2008).

The Mackenzie River and its larger tributaries are believed to be the only spawning areas for Arctic cisco. Spawning takes place in October, likely over gravel in areas of fast-moving water such as rapids (Community of Inuvik *et al.* 2008; Community of Tuktoyaktuk *et al.* 2008).

The diet of the Arctic cisco includes small fish and crustaceans (Community of Inuvik *et al.* 2008; Community of Tuktoyaktuk *et al.* 2008).

Arctic cisco are subsistence food fish and are caught during their migrations to and from overwintering areas (e.g., in Tuktoyaktuk Harbour). They are also classified as a game fish in the NWT (CanLII 2011b). There are no known management plans or agreements in place in the ISR and they are considered abundant and to be an adequate source of subsistence fish (Community of Inuvik *et al.* 2008; Community of Tuktoyaktuk *et al.* 2008). Their status is listed as Sensitive in the NWT (GNWT, ENR 2011c).

Arctic Grayling

Arctic grayling are trout-like fish with small toothed jaws, large scales, dark blue fish with pink or purple tones and an iridescent sheen. They have notable sail-like dorsal fin. Adult fish average 35 cm in length and the maximum weight is approximately 2.5 kg (GNWT, ENR 2011c GRRB 2011; Community of Inuvik *et al.* 2008; Community of Tuktoyaktuk *et al.* 2008). They reach sexual maturity between two and nine

years and live for up to 22 years (Evans *et al.* 2002), but in the NWT likely live for up to nine years (GRRB 2011).

Arctic grayling are found throughout the northern reaches of Canada's western provinces as well as the NWT, Yukon and Alaska. Populations also exist in the Missouri River headwaters (Montana) and Eurasia. Arctic grayling require the cold, clear water of small streams and medium rivers and are rare in the Mackenzie River's turbid waters, although are found in the rivers to the east of the Mackenzie. The species may be highly migratory, using different streams for its different life stages, or it may remain in a relatively small area of a stream or lake. They typically overwinter in lakes or deep pools in rivers (Evans *et al.* 2002).

Once mature, it is likely that Arctic grayling spawn every year. They migrate from lakes and rivers into smaller streams to spawn in May and June during ice break-up. Spawning may occur in water with temperatures between 7 to 10°C, preferably over gravel substrates but they may also use sand in areas of running water over gravel and also in lakes. Areas with surface current velocities of less than 1.4 meters per second (m/s) have been used for spawning in varying water depths with typically small, unimbedded gravels (up to 2.5 cm in diameter); the eggs attach to the substrate and may be buried. Spawning takes place over two to three days (Evans *et al.* 2002).

In June after spawning, adults move into rivers. Preferable summer feeding habitat for adults is over fine grained and coarse substrates (medium-grained substrates are avoided) in areas with rubble and rocks for cover. They may prefer deep (e.g., 110 to 152 cm), high velocity (e.g., 0.61 to 1.08 m/s) water. Arctic grayling use rubble, rock, overhanging riparian vegetation, undercut banks, deadfall, and sometimes aquatic and emergent vegetation for cover (Evans *et al.* 2002).

Upon hatching, fry may remain in semi-deep pools and side channels with boulder, cobble, silt and sand substrates, with water depths of 30 to 50 cm, and velocities of less than 0.8 m/s. Cover rock is considered important. Young-of-the-year (YOY) can remain in their natal streams for up to 15 months, then are distributed throughout the Mackenzie Delta. Juveniles prefer sand and gravel substrates and the provision of cover such as rocks. Slow-moving water with shallow depths are preferred when young, but as they grow they may move to deeper and faster water (Evans *et al.* 2002).

The diet of the Arctic grayling includes terrestrial and aquatic insects, crustaceans, small fish and fish eggs (Community of Inuvik *et al.* 2008; Community of Tuktoyaktuk *et al.* 2008).

Arctic graylings are a subsistence food fish and, considered a game fish in the NWT, are particularly valued for sports fisheries (CanLII 2011b; Community of Inuvik *et al.* 2008; Community of Tuktoyaktuk *et al.* 2008). They may also be used for dog food (GRRB 2011). There are no known management plans or agreements in place in the ISR for the species. However, Arctic grayling are considered valued species in the Highway corridor because of their potential vulnerability to habitat disturbances (Kiggiak-EBA 2010pd). They are locally common in certain streams and there is considered to be an adequate supply of the fish (Community of Inuvik *et al.* 2008; Community of Tuktoyaktuk *et al.* 2008). Their status is listed as Sensitive in the NWT (GNWT, ENR 2011c).

Broad Whitefish

Broad whitefish have deep bodies, short heads and a blue snout. The average length of an adult is 45 cm but they can reach up to 90 cm. Females reach maturity at around seven years of age and the

species can live for over 15 years, even up to 24 years (GNWT, ENR 2011c; GRRB 2011; Community of Inuvik *et al.* 2008; Community of Tuktoyaktuk *et al.* 2008).

Broad whitefish are found throughout fresh and brackish waters of the Arctic drainage basins of north-west North America and north Eurasia, south to approximately 60° North latitude. Overwintering habitats include the East Channel of the Mackenzie River and Whitefish Bay. They may be found in coastal areas of the Beaufort Sea including Tuktoyaktuk Harbour, Mason Bay, Mallik Bay, Shallow Bay and streams in the Tuktoyaktuk Peninsula (Community of Inuvik *et al.* 2008; Community of Tuktoyaktuk *et al.* 2008).

Typical habitats for broad whitefish are larger, lower-gradient and moderately turbid river systems, delta lakes and brackish estuaries, and they are more common in rivers than lakes. Both anadromous and non-migratory stocks exist in the Mackenzie River Basin. Adults, YOY and juveniles feed in the rivers and lakes, and adults also feed along the coast (Evans *et al.* 2002).

Broad whitefish spawn throughout the Mackenzie River system. They move upstream in July and August, and spawning takes place in October and November under ice over gravel areas in rivers, then gradually migrate downstream to overwinter in deeper river areas in the Lower Mackenzie area. The young hatch in spring (April and May) and move downstream with spring run-off, with the young dispersing through the Mackenzie Delta and along the coast, including to the Tuktoyaktuk Peninsula (Community of Inuvik *et al.* 2008; Community of Tuktoyaktuk *et al.* 2008; Evans *et al.* 2002). Then the YOY and juveniles move migrate upstream to feeding and nursing areas throughout the Mackenzie River system, then overwinter in coastal lakes over 3 m deep and streams (e.g., on the Tuktoyaktuk Peninsula) and remain in those areas for one to four years before migrating back to coastal areas. YOY and juveniles in lakes seem to prefer sand, cobble, silt and gravel substrates. Adults spend much time in brackish estuaries. Older fish may remain in lakes for one or more years without migrating (Evans *et al.* 2002).

Their diet is composed of aquatic insects and their larvae, small molluscs and crustaceans (GRRB 2011; Community of Inuvik *et al.* 2008; Community of Tuktoyaktuk *et al.* 2008).

Broad whitefish are a subsistence food fish, and are also harvested by commercial fishery operations (south of the ISR). In the NWT, they are sold fresh, dried and smoked (GNWT, ENR 2011c; Community of Inuvik *et al.* 2008; Community of Tuktoyaktuk *et al.* 2008). Broad whitefish are also classified as a game fish in the NWT (CanLII 2011b). There are no known management plans or agreements in place in the ISR for the species. They are locally abundant and the goal is to maintain the abundant population to support subsistence harvest (Community of Inuvik *et al.* 2008; Community of Tuktoyaktuk *et al.* 2008). Their status is Secure in the NWT (GNWT, ENR 2011c).

Burbot

Burbot are elongated fish with oval shaped tales and a whisker-like barbell under the chin. Their colour can range from yellow to almost black, depending on the water clarity (Spectacular NWT 2011). Females are typically larger than males. The maximum size is approximately 100 cm long and the maximum weight around 8.4 kg. The fish may live for up to 15 years with females becoming sexually mature at three to four years of age (Community of Inuvik *et al.* 2008; Community of Tuktoyaktuk *et al.* 2008).

Burbot are common in rivers and lakes of the NWT. They can be found in fresh and brackish coastal waters in the winter and spring, including the outflows of small streams in the Mackenzie Delta during early winter (Spectacular NWT 2011; Community of Inuvik *et al.* 2008; Community of Tuktoyaktuk *et al.*

2008). They spend summers in deep water, moves to river tributaries during winter and spring, and to creek mouths in fall. Burbot spawn in mid-winter beneath the ice in water up to 3 m deep over sand or gravel in shallow bays or gravel shoals. Spawning typically occurs in lakes but sometimes also in rivers (Community of Inuvik *et al.* 2008; Community of Tuktoyaktuk *et al.* 2008).

Their diet is primarily composed of aquatic insects when young and fish when adults (Community of Inuvik *et al.* 2008; Community of Tuktoyaktuk *et al.* 2008).

Burbot are a subsistence food fish (Community of Inuvik *et al.* 2008; Community of Tuktoyaktuk *et al.* 2008) and may also be used as dog food (GRRB 2011). They are classified as a game fish in the NWT (CanLII 2011b). There are no known management plans or agreements in place in the ISR for the species. Its population appears to be locally common and stable and the goal is to maintain the abundant population to support subsistence harvest (Community of Inuvik *et al.* 2008; Community of Tuktoyaktuk *et al.* 2008). Their status is listed as Secure in the NWT (GNWT ENR 2011c).

Dolly Varden

Dolly varden are a charr species mainly occurring west of the Mackenzie River (Chelsea 2010). They have light spots on their sides which distinguish them from the other dark-spotted trout and salmon species. Adults at first spawning (age five to nine years) may be up to 41 cm long and weigh 20 to 40 grams (g), but they reach maximum sizes of 56 cm and maximum weights of 1.8 kg. Adults may live for up to 16 years (Chelsea 2010; Community of Inuvik *et al.* 2008; Community of Tuktoyaktuk *et al.* 2008).

Within the ISR, dolly varden typically occur to the west of the Mackenzie River in rivers such as the Big Fish, Babbage, Firth, Joe Creek and Rat rivers (Community of Inuvik *et al.* 2008; Community of Tuktoyaktuk *et al.* 2008; DFO 2006), been caught near Inuvik. Other important habitats include Fish Hole, Shingle Point, Fish Creek, and the, Peel River (Chelsea 2010).

Dolly varden in the ISR can be anadromous, residual (riverine) or isolated (stream-resident). Anadromous fish migrate to sea, returning to fresh water to spawn and overwinter; residual fish remain in rivers; and isolated fish live above waterfalls on the Babbage and Big Fish rivers (while the others remain downstream) and some rivers and lakes in the Peel River and Gayna River watersheds (Chelsea 2010).

Dolly varden are found in upstream reaches of river systems that remain unfrozen because of groundwater input. These groundwater discharge sites are habitats for spawning, rearing and overwintering, but such areas are limited in most river systems. Larger rivers are used for migratory routes and marine habitats are used for feeding (for anadromous fish; GRRB 2011; Chelsea 2010).

Spawning occurs in fall from August to November in mountain streams fed by groundwater. Females deposit their eggs in redds in the gravel substrates of streams. The eggs develop slowly in the cold water and hatching can occur in February after which the young remain in the gravel until June. They then remain in streams before migrating to sea in their third or up to their sixth year. This migration usually occurs in May or June but may even occur as late as October. As adults, northern dolly varden typically overwintering in freshwater rivers (southern populations overwinter in lakes) and they spawn in their natal rivers. Adults do not spawn until after spending three to four summers at sea, and after spawning mortality is common, particularly for males, although some fish may live to spawn more than twice Chelsea 2010; Community of Inuvik *et al.* 2008; Community of Tuktoyaktuk *et al.* 2008).

The diet of dolly varden includes insect larvae and gastropods but is primarily comprised of other fish (GRRB 2011).

Dolly varden are a subsistence food fish. They are classified as game fish in the NWT (CanLII 2011b). Management plans for dolly varden include the *Rat River Charr Fishing Plan* and the planned *West Side Charr Fishing / Management Plan* (for the Aklavik area; Community of Inuvik *et al.* 2008; Community of Tuktoyaktuk *et al.* 2008) as well as the *Integrated Fisheries Management Plan for Dolly Varden (Salvelinus malma malma) of the Gwich'in Settlement Area and Inuvialuit Settlement Region Northwest Territories and Yukon North Slope 2011 – 2015* (Chelsea 2010). Their status is listed as Sensitive in the NWT (GNWT, ENR 2011c).

Finescale Dace

Finescale dace are small minnows with dark brown backs, greenish sides, whitish bellies, and a dark lateral line. The males' bellies turn yellow to red when breeding. The fish grow up to 13 cm in length (Rook 1999). Finescale dace mature at 1 to 2 years, and males can reach 5 years of age while females can live for up to six years (Evans *et al.* 2002).

In the NWT, finescale dace are found in the Mackenzie River system north into the Mackenzie Delta and Arctic Red River, representing the northern-most distribution of the species' range (GNWT, ENR 2011c).

Finescale dace are schooling fish that exhibit both lacustrine (lake) and riverine life history types. They are found in clear, acidic, stained boggy waters, preferring light to dark brown water in bog ponds, streams and large lakes (GNWT, ENR 2011c; Evans *et al.* 2002; Rook 1999). Adults are often found in pool areas of creeks at depths between 10 and 50 cm over sand, gravel, silt and mud substrates, often in areas with fallen tree cover (GNWT, ENR 2011c; Rook 1999).

Spawning takes place when waters become ice-free in spring and midsummer and may occur under the cover of trees, brush and logs in water that is 50 to 90 cm in depth. Eggs hatch after four days (GNWT, ENR 2011c; Rook 1999). Spawning may occur in water temperatures from 11 to 19°C at depths of 50 to 90 cm. Eggs may be deposited under submerged logs and brush piles and sink into the mud or gravel substrate (Evans *et al.* 2002).

Their diet is composed of insects, crustaceans and plankon (Rook 1999).

They are used as a bait fish in southern Canada (Rook 1999). They are no food fish and their use in the ISR is not known. There are no known management plans or agreements in place in the ISR for the species. Their status is listed as Secure in the NWT (GNWT, ENR 2011c).

Flathead Chub

Flathead chub have a wide flat head, small eyes and a barbell at the angle of the mouth. They grow up to 30 cm in length and adults in the Mackenzie River area can reach 13 years of age (GRRB 2011; Evans *et al.* 2002).

In the NWT, flathead chub can be found around Great Slave Lake, Great Bear River and along the Mackenzie River into the delta (NWT, ENR 2011c; Evans *et al.* 2002).

Flathead chub prefer swift, turbid muddy river water and slow-moving creeks, and it is not typically found in still or clear water. They are most often encountered in rivers and rarely in lakes and ponds (Evans *et*

al. 2002). They occur in habitats with rubble, gravel, sand, silt and mud substrates at depths from 0.15-0.25 m and velocities between 0.005 and 1.5 m/s (GNWT, ENR 2011c).

Spawning may occur in spring and June through August. The fish may move into small stream to spawn and they spawn annually but details on their spawning habitat preference is unknown (Evans *et al.* 2002).

The diet of the flathead chub includes insect larvae, berries, seeds and other fish (GRRB 2011).

Flathead chub are not typically used as a human food fish. Little is known about their status in the Mackenzie River system (GRRB 2011; Evans *et al.* 2002). There are no known management plans or agreements in place in the ISR for the species. Their status is listed as Secure in the NWT (GNWT, ENR 2011c).

Fourhorn Sculpin

Fourhorn sculpin are relatively flat fish with large pectoral fins and a mottled silvery colouration. They can reach 25 cm in length and weigh up to 0.13 kg (Ontario Freshwater Fishes 2011). Females mature at four to five years, and females may live up to 14 years and males up to 11 years (GNWT, ENR 2011c).

There are marine and freshwater forms of the fourhorn sculpin (GNWT, ENR 2011c) and they live in ocean, estuary and river habitats. They are benthic fish that prefer cold neashore areas in water that is less than 20 m deep with a temperature range between 1 and 9°C (Ontario Freshwater Fishes 2011). The freshwater form of the fourhorn sculpin live exclusively in lakes (GNWT, ENR 2011c; Evans *et al.* 2011). They may be diurnal in winter and primarily nocturnal in summer (Freyhof and Kottelat 2008).

Fourhorn sculpin spawn mostly in lakes (GNWT, ENR 2011c) on the ceilings of small cavities over gravel or rock substrates. Juveniles may move to shallow water in the fall and then to deeper water in spring where they remain for the summer (Freyhof and Kottelat 2008).

The diet of fourhorn sculpin includes invertebrates and fish (Freyhof and Kottelat 2008).

There are no known management plans or agreements in place in the ISR for the species. They are no food fish and their use in the ISR is not known. Their status is listed as Undetermined in the NWT (GNWT, ENR 2011c).

Inconnu

Inconnu are the largest in the whitefish family and can be distinguished from other species by the extended lower jaw. They have large silver scales and dark green or pale brown backs. They can measure 100 cm in length and obtains weights of over 20 kg. Males reach maturity between ages 6 to 11 years and the fish can live for up to 35 years (GRRB 2011; Community of Inuvik *et al.* 2008; Community of Tuktoyaktuk *et al.* 2008; Bell 2000).

Inconnu are distributed throughout north-west North America and Eurasia, and in the Mackenzie River Basin and Mackenzie River Delta; they are migratory, typically anadromous fish (Bell 2000). The Mackenzie River estuary is important rearing habitat. Inconnu can migrate long distances upstream to spawn, or non-anadromous populations can be lake dwelling. The anadromous stocks overwinter in the outer Mackenzie Delta and/or other marine and freshwater coastal areas and migrate during ice break-up to feeding grounds or spawning areas if mature (Community of Inuvik *et al.* 2008; Community of Tuktoyaktuk *et al.* 2008; Bell 2000).

Inconnu begin their spawning migration in the inner Mackenzie Delta in July and move to upstream spawning sites. Spawning occurs in October and September; spawning areas include the Mackenzie River and its tributaries. Inconnu need silt-free, fast-moving water and gravel-boulder substrates, and spawning usually takes place in 1 to 3 m of water. Inconnu are able to spawn more than once in their lifetime, likely every other year. After spawning, inconnu move quickly downstream and then return to coastal areas (Community of Inuvik *et al.* 2008; Community of Tuktoyaktuk *et al.* 2008; Bell 2000).

The diet of inconnu includes plankton (fry), insect larvae and small fish (young) and then primarily fish (second year and older; Community of Inuvik *et al.* 2008; Community of Tuktoyaktuk *et al.* 2008).

Inconnu are an important subsistence food fish and are also fished for dog food in the ISR. Inconnu are classified as a game fish in the NWT (CanLII 2011b). Peak harvest times include July and October during the fish's migratory periods (Bell 2000). The Inconnu's population is locally high and the goal is to maintain the abundant population to support subsistence harvest (Community of Inuvik *et al.* 2008; Community of Tuktoyaktuk *et al.* 2008).

An integrated fisheries management plan was developed to address management of this species which migrates through several land claim areas of the Lower Mackenzie River Basin. *The Integrated Fisheries Management Plan for Coney (*Stenodus leuchicthys*) in the Gwich'in Settlement Area, Inuvialuit Settlement Region, and the Sahtu Settlement Area, Northwest Territories 2000-2005* (Bell 2000). It was the first integrated fisheries management plan established for the area and intended to address the needs and concerns of the people using inconnu (Bell 2000).

Lake Chub

Lake chub are long, stout fish with light gray backs and upper sides and silvery undersides. Males have pink around their mouths and females have pink around their pectoral fins at spawning time. There is a barbel at the corner of the mouth. They can reach lengths of 20 cm (Rook 1999). Females reach maturity at three to four years and the species can live for up to five years (GNWT, ENR 2011c). Lake chub reproduce annually (GNWT, ENR 2011c).

Lake chub are found across northern North America and are common in the Mackenzie River system. They exhibit lacustrine, adfluvial (live in lakes but spawn in rivers) and riverine life history types (Evans *et al.* 2002).

Adults prefer lake and large river habitats, but are also found in stream habitats (GNWT ENR 2011c; Evans *et al.* 2002). Habitats range from hot spring outlets to cool rivers, and the fish may be found in both clear and muddy waters, often moving to deeper water during summer. Lake chub are sometimes schooling fish (Evans *et al.* 2002; Rook 1999).

Spawning occurs along the shores of lakes or in tributary streams and in lakes. In the Mackenzie Delta they may spawn in August. In Northern Saskatchewan, adfluvial lake chub have been found spawning amongst rocks in shallow waters of 5 cm with slow flow at a temperature of 4 to 8°C. Spawning occurres over silt, gravel and leaves. Eggs may hatch after 10 days. After spawning in rivers, the adfluvial fish return to their lakes (Evans *et al.* 2002).

There are many nursery areas in the Mackenzie River. Riverine juveniles prefer creeks with rocky bottoms. Riverine adults are found in clear streams and tributary mouths to more turbid waters, and they also prefer creeks with rocky bottoms (Evans *et al.* 2002).

Their diet includes aquatic and terrestrial insects, algae, zooplankton and small fish (Rook 1999).

Lake chub are no food fish and their use in the ISR is unknown. There are no known management plans or agreements in place in the ISR for the species. Their status is listed as Secure in the NWT (GNWT, ENR 2011c).

Lake Trout

Lake trout are a salmonid, freshwater species with a deeply forked tail and light spots on its body and tail. Body colouration can range from light green or grey to dark green or brown to almost black, with a lighter coloured belly (GNWT ENR 2011c). They average 4.5 kg in weight but may weigh in excess up to 35 kg and more. This trout is a long-lived species and may not reach sexual maturity until 16 years of age (Community of Inuvik *et al.* 2008; Community of Tuktoyaktuk *et al.* 2008) or females may reach maturity as young as six to seven years (GNWT ENR 2011c). They can live for up to 25 years (GRRB 2011).

Lake trout range across many northern areas of North America. They are found throughout mainland NWT including the Husky Lakes area. They are typically found in large, deep lakes of the Mackenzie Delta and sometimes in rivers or brackish water (Community of Inuvik *et al.* 2008; Community of Tuktoyaktuk *et al.* 2008).

The fish spawn in September over rocky substrates, usually over the shoals of lakes or along island shores but sometimes may also spawn also in streams and rivers. Lake trout can spawn every second or third year (Community of Inuvik *et al.* 2008; Community of Tuktoyaktuk *et al.* 2008; Evans *et al.* 2002).

The extent to which lake trout use river habitats is unknown, but could include use for migration corridors between lakes, as feeding areas, and as spawning and nursery areas (Evans *et al.* 2002).

The diet of lake trout includes cisco, smelt, stickleback and sculpins as well as plankton and crustaceans (Community of Inuvik *et al.* 2008; Community of Tuktoyaktuk *et al.* 2008). They also feed on insects and bottom organisms (GRRB 2011).

Lake trout are subsistence food fish and are considered particularly important as a game fish species (GNWT, ENR 2011c; Community of Inuvik *et al.* 2008; Community of Tuktoyaktuk *et al.* 2008). They are also classified as a game fish in the NWT (CanLII 2011b). A special Hunters and Trappers Committee (HTC) Bylaw requires a minimum net mesh size of 11 cm for catching the fish, while commercial fishing net mesh size must be a minimum of 14 cm. Its population appears to be stable, and the goal is to maintain the adequate population to support current harvest (Community of Inuvik *et al.* 2008; Community of Tuktoyaktuk *et al.* 2008). Their status is listed as Secure in the NWT (GNWT, ENR 2011c).

Lake Whitefish

Lake whitefish are narrow fish with silvery bodies and relatively small heads (Spectacular NWT 2011). They may have a hump on their back just behind the head. There are differences in colour and physical attributes between lake dwelling and anadromous fish. They can be up to 60 cm in length and weigh up to 13 kg. They may live for up to 23 years (GRRB 2011; Community of Inuvik *et al.* 2008; Community of Tuktoyaktuk *et al.* 2008).

Lake whitefish are found across Canada, primarily in large lakes and rivers. They primarily inhabit freshwater, but may also enter brackish water. The fish overwinters in various areas such as the streams

of the Tuktoyaktuk Peninsula and throughout the Mackenzie River system (including the East Channel). Important habitats for lake whitefish include overwintering areas in the East Channel of the Mackenzie River, Whitefish Bay, Tuktoyaktuk Harbour, Mason Bay, Mallik Bay, and streams in the Tuktoyaktuk Peninsula (Community of Inuvik *et al.* 2008; Community of Tuktoyaktuk *et al.* 2008). Lake whitefish prefer cool water and in summer move from shallow to deeper water, then back to shallow water as it cools (Kiggiak-EBA 2011).

The fish spawn in September and October, likely every two or three years, and the Mackenzie River system is important spawning habitat, and sometimes its tributary streams are used as well. Spawning takes place in shallow areas over cobble and gravel substrates, or sometimes sand. Lake whitefish broadcast their eggs over the substrate, and they eggs hatch the following spring. Larval fish prefer steep shoreline habitats, but they move to deeper waters in summer as juveniles (Kiggiak-EBA 2011; Community of Inuvik *et al.* 2008; Community of Tuktoyaktuk *et al.* 2008). Lake whitefish may migrate to the ocean after spawning or remain in freshwater their entire lives, spending winters in deep lakes (GRRB 2011).

The diet of lake whitefish includes aquatic insects, molluscs, amphipods, small fish and fish eggs (Community of Inuvik *et al.* 2008; Community of Tuktoyaktuk *et al.* 2008).

Lake whitefish are subsistence food fish, particularly fished in the Husky Lakes area. They are the most commonly caught commercial fishery in the southern NWT, but the Mackenzie Delta stock is less desirable than other whitefish species as a food fish because of its softer flesh and tendency to harbour parasites. Most fish caught are between 6 to 10 years of age (Community of Inuvik *et al.* 2008; Community of Tuktoyaktuk *et al.* 2008). They may also be used for dog food (GRRB 2011). Lake whitefish are classified as a game fish in the NWT (CanLII 2011b). There are no known management plans or agreements in place in the ISR for the species. They are considered locally abundant and the goal is to maintain the population to support subsistence harvest (Spectacular NWT 2011; Community of Inuvik *et al.* 2008; Community of Tuktoyaktuk *et al.* 2008). Their status is listed as Secure in the NWT (GNWT, ENR 2011c).

Longnose Dace

Longnose dace are minnows that are olive-green to brown on their backs and upper sides, have white bellies, and have a mottled appearance and a lateral band. Breeding males develop pink undersides. They average up to 7 cm in length (Rook 1999). Longnose dace reach maturity at 2 to 3 years of age (Evans *et al.* 2002) and can live for five years (GNWT, ENR 2011c).

Longnose dace are found throughout north-west Canada and occur across the NWT including the Mackenzie River system (Evans *et al.* 2002; Rook 1999). Longnose dace are benthic fish found in cool, clear streams with swift flow, even very turbulent waters with gravel or boulders along the bottom. They may also be found in clear river pools and the nearshore areas of lakes. Adults are nocturnal, and they spend daytimes under rocky covers (GNWT, ENR 2011c; Evans *et al.* 2002).

In southern areas spawning can begin in May and continue into late August. It occurs in riffle areas in rivers over gravel substrates, and eggs are laid in nests of small pebbles amongst stones and may be guarded by one parent (Evans *et al.* 2002; Rook 1999). Juveniles are generally found in shallow water over sand, gravel and rock substrates (GNWT ENR 2011c).

Adult longnose dace are bottom dwellers that are found in rocky sections of tributaries. Migrations, presumably post-spawning, have been observed between July and September in the Mackenzie River system at Rabbitskin River in the Sahtu region (south of the ISR). The longnose dace prefers rubble, sand, boulders and silt but can sometimes be found over mud, clay, bedrock and detritus (Evans *et al.* 2002).

Their diet includes insect larvae, worms and algae (Rook 1999).

Longnose dace are sometimes used as bait fish (Rook 1999); thy are no food fish and their use in the ISR is unknown.. There are no known management plans or agreements in place in the ISR for the species. Their status is listed as Secure in the NWT (GNWT ENR 2011c).

Longnose Sucker

Longnose suckers are long, round fish with a long pointed sucker mouth. They are dark olive or grey to nearly black on their backs and upper sides with white to cream bellies and yellow to orange chins and mouths. They have a reddish band along the sides of breeding females and males. They can obtain lengths of 46 cm and weights of 0.8 kg (Rook 1999). Males mature at between four and nine years, and females between 6 and 12 years of age and they may reach up to 20 years of age in the Mackenzie River system (Evans *et al.* 2002).

Longnose suckers are found throughout North America and Asia (Rook 1999). Longnose suckers are bottom-dwelling fish and are common in the NWT in rivers, lakes and streams with clear or turbid water (Evans *et al.* 2002). They exhibit adfluvial, riverine and lacustrine life history types (Evans *et al.* 2002) and they are common in clear, cool, spring-fed creeks, lakes and tributary streams as well as lakes and rivers with cold or warm water (Rook 1999).

Spawning occurs primarily in rivers and inlet streams, but may also occur in river outlets lake shallows when the ice cover melts (GRRB 2011; Evans *et al.* 2002). Spawning in the Arctic Red and Hay rivers in the NWT takes place in May and June when the water temperature is between 8 and 16°C. From their spawning sites in the Arctic Red River (in the Gwich'in Settlement Area south of the ISR), they may migrate up the Mackenzie River and are occasionally caught in delta (Rescan 1999). They have been found in the Tuktoyaktuk Peninsula region, in Parsons Lake and in the Keneksek System (Rescan 1999).

Preferred spawning habitat includes large rocks or sand and gravel less than 1 cm in diameter, in water with depths between 15 and 54 cm and a velocity between 25 and 100 cm/s. The eggs are broadcast and the eggs hatch in seven days to eleven days at temperatures between 17 and 10°C, respectively. The young hatch and migrate downstream, with YOY common in fast-flowing clear rocky stream mouths and shallow pools within stream rapids (Evans *et al.* 2002). After spawning, the adults return to lakes and river habitats downstream of the spawning area (Evans *et al.* 2002).

The diet of the longnose sucker includes insect larvae and amphipods (GRRB 2011), algae, crustaceans and snails (Rook 1999).

Longnose suckers are used as food fish and frozen fillets are sold as "mullet" (Rook 1999). Longnose suckers are classified as a game fish in the NWT (CanLII 2011b). There are no known management plans or agreements in place in the ISR for the species. Their status is listed as Secure in the NWT (GNWT ENR 2011c).

Ninespine Stickleback

Ninespine stickleback have slender scaleless bodies. They can be light olive to brown or even grayish black in colour, with mottled sides and a lighter silvery-white belly. They are known to have nine dorsal spines along its back, but the number of spines can range from seven to twelve. Ninespine stickleback average 6.4 cm in length (University of New Brunswick [UNB] 2011). Males are often subject to post-spawning mortality and typically live up to three years of age, but females may live five years or more. Females mature at one year of age (GNWT, ENR 2011c).

Ninespine stickleback occur in freshwater and sometimes saline ecosystems throughout Canada, including across the NWT. They are found in the Mackenzie River system including the Mackenzie Delta (GNWT, ENR 2011c).

Ninespine stickleback prefer slower moving areas of streams with vegetation. They typically live in shallow water but have been found up to depths of 110 m. In spring, ninespine stickleback may move inshore to shallow waters, then spawn on weeds and vegetation in freshwater creeks in summer. In fall, they may move back offshore to saline ocean waters (GNWT, ENR 2011c; UNB 2011).

Spawning occurs in summer in freshwater habitats amongst the weeds and vegetation of freshwater creeks. The males build a nest of plant material which the female enters to lay her eggs after which the male protects the nest (GRRB 2011).

The diet of the ninespine stickleback includes aquatic insects, crustaceans, young fish and fish eggs (UNB 2011).

The ninespine stickleback serves as a prey fish for other larger fish and also fish-eating birds (UNB 2011). It may also have a role in commercial fisheries, and the aquarium trade in the NWT (GNWT, ENR 2011c). There are no known management plans or agreements in place in the ISR for this species. Their status is listed as Secure in the NWT (GNWT, ENR 2011c).

Northern Pike

Northern pike are long, stream-lined fish with a long mouth and plentiful sharp teeth. They occur across the ISR and can obtain lengths of 120 cm and weigh up to 20 kg and live up to 26 years (Community of Inuvik *et al.* 2008; Community of Tuktoyaktuk *et al.* 2008). Females reach sexual maturity at six years and they can live for up to 26 years in the Arctic (GNWT, ENR 2011c; GRRB 2011).

Northern pike occur throughout most of Canada, excluding the Maritimes and parts of British Columbia, but including most waters of the western Arctic. They are generally non-migratory fish, but can move long distances (e.g., 100 km). They typically inhabit lakes, warm, clear river channels and calm water areas, including the Mackenzie Delta's tributaries, creeks and shallow lakes (Community of Inuvik *et al.* 2008; Community of Tuktoyaktuk *et al.* 2008).

Northern pike spawn in spring, often beneath ice cover. Spawning occurs on aquatic vegetation or eggs are laid on the bottoms of small creeks or shallow lakes (GRRB 2011; Community of Inuvik *et al.* 2008; Community of Tuktoyaktuk *et al.* 2008).

The diet of opportunistic northern pike includes primarily fish but also muskrats and ducklings (Community of Inuvik *et al.* 2008; Community of Tuktoyaktuk *et al.* 2008).

Northern pike are a subsistence food fish, highly regarded and classified as a freshwater game fish in the NWT, and they are also used in commercial fisheries (CanLII 2011b; GNWT, ENR 2011c; Spectacular

NWT 2011; Community of Inuvik *et al.* 2008; Community of Tuktoyaktuk *et al.* 2008). There are no known management plans or agreements in place in the ISR for the species. They are considered abundant and the goal is to maintain the population to sustain subsistence harvest (Community of Inuvik *et al.* 2008; Community of Tuktoyaktuk *et al.* 2008). Their status is listed as Secure in the NWT (GNWT, ENR 2011c).

Pond Smelt

Pond smelt have a large dorsal fin, adipose fin, and large eyes. Their bodies brownish to olive green with a silver stripe on the mid-flank and a silvery-white belly. Their head and cheeks are speckled (University of Guelph 2011a). Pond smelt can be up to 20 cm in length, but are typically around 11 cm, and weight up to 50 grams (g; Saruwatari *et al.* 1997). The fish are mature at two to three years of age and typically only live for up to three years (GNWT, ENR 2011c).

Pond smelts are found in North America and Asia (Saruwatari *et al.* 1997). They have been found in the lower portions of the Mackenzie and Peel rivers, including the Mackenzie Delta, and around Tuktoyaktuk (GNWT, ENR 2011c; Evans *et al.* 2002).

Pond smelts are typically found in rivers, streams and lakes, and they have both riverine and lacustrine life history types (Evans *et al.* 2002). They can live in marine, brackish and freshwater environments and are often found in estuaries and coastal waters and also freshwater environments in lowland rivers and lakes. They prefer the middle and surface water of ponds, lakes and streams over various substrate types. Anadromous populations are pelagic and sea, typically at four to five m depth, and move upstream to spawn in rivers. Landlocked populations may spawn in lakes or migrate into tributaries (Saruwatari *et al.* 1997).

Spawning occurs in spring and early summer along the shores of shallow rivers and backwater areas with little or no currents, or in lakes, typically over sand or gravel substrates or over organic debris (GNWT, ENR 2011c; Saruwatari *et al.* 1997). The riverine forms spawn in rivers and streams in June. In Alaska, spawning occurs over gravel and sand. In Russia, they spawn in water with depths of up to 1 m and velocities between 0.7 and 0.8 m/s. Eggs hatch in approximately 10°C. In Alaska, juveniles are found in rivers over sand and mud bars (Evans *et al.* 2002).

The diet of pond smelt includes zooplankton, insects, algae (Saruwatari *et al.* 1997) and crustaceans (University of Guelph 2011a).

Pond smelt are used as food fish. They are also prey for inconnu, northern pike and salmons (University of Guelph 2011a). There are no known management plans or agreements in place in the ISR for the species. Their status is listed as Undetermined in the NWT (GNWT, ENR 2011c).

Rainbow Smelt

Rainbow smelt are slender, cylindrical fish with silvery, pale green backs, iridescent purple blue and pink sides and white bellies. They can be up to 30 cm in length but are typically under 23 cm (Rook 1999). Females reach maturity at two to three years, and they can live for up to six years. They reproduce once a year (GNWT ENR 2011c).

In the NWT rainbow smelt are found in the Mackenzie Delta and coastal areas and live in marine, brackish and freshwater systems (GNWT ENR 2011c). They are found in nearshore saltwater environments as well as inland lakes and streams (Rook 1999). Adults use the midwaters of lakes and

coastal areas (GNWT, ENR 2011c). In offshore areas they are found at dark, cool depths. They prefer water temperatures between 6 and 13°C (Rook 1999).

Spawning occurs in spring in streams or on gravelly lake shores, usually in the darkness. Eggs are laid and sink to the gravel substrate. When the young hatch they drift downstream to deep water (GNWT, ENR 2011c; Rook 1999).

Their diet is mainly composed of crustaceans, worms, squid, aquatic and terrestrial insects and small fish (GNWT ENR 2011c; Rook 1999).

Rainbow smelts are used as food fish (Rook 1999). There are no known management plans or agreements in place in the ISR for the species. Their status is listed as Undetermined in the NWT (GNWT, ENR 2011c).

Round Whitefish

Round whitefish have a slender body silvery with a relatively short head and a silvery white underside. The scales on their back are well-defined with dark pigmented borders. The fish may grow up to 50 cm in length and they can weigh up to 2.7 kg. They may live for up to 16 years (Page and Burr 1991).

Round whitefish occur in the Arctic and Pacific drainages of North America as well as in Northern Asia. In Canada, they occur in Arctic drainages from western Hudson Bay to Alaska, including across the NWT mainland, Mackenzie Delta, and along coastal areas of the Beaufort Sea. They typically live in the shallows of lakes and clear streams, including rivers with swift currents and gravel bottoms, but sometimes enter brackish water (Page and Burr 1991).

Round whitefish may migrate for spawning purposes; they usually spawn in the shallow waters over the shoals of lakes, river mouths or in rivers (GNWT, ENR 2011c; Page and Burr 1991).

The diet of the round whitefish includes invertebrates and sometimes fish and fish eggs (Page and Burr 1991).

Round whitefish are subsistence food fish and are classified as a game fish in the NWT (CanlII 2011b; GNWT, ENR 2011c). There are no known management plans or agreements in place in the ISR for this species. Their status is listed as Secure in the NWT (GNWT, ENR 2011c).

Slimy Sculpin

Slimy sculpin are bottom-dwellers that are olive-coloured with dark mottling and lighter bellies and large pectoral fins. They can be up to 10 cm in length and can live for up to five years (Rook 1999).

Slimy sculpins live throughout North America and north-east Asia (Rook 1999), including the NWT. They are sometimes found in lakes but prefer cool, clear or muddy waters of rivers, streams and creeks over rocky or gravelly bottoms. Typically, they live on stream bottoms and their activity is primarily nocturnal (Evans *et al.* 2002; Rook 1999). They have both lacustrine and riverine life history types. Adults in the Arctic prefer clear gravelly streams. They have small home ranges and do not migrate very far (Evans *et al.* 2002).

Spawning in riverine fish occurs in April and May (Rook 1999). Spawning in riverine fish may take place in a nest under a rock, ledge or submerged tree root where the adhesive eggs are laid on a ceiling such

as the underside of a stone (Evans *et al.* 2002; Rook 1999). Juveniles prefer deeper water with stronger currents but the same substrate (Evans *et al.* 2002).

The diet of the slimy sculpin includes aquatic insect larvae and other invertebrates and fish eggs (Rook 1999).

Slimy sculpin are no food fish and their use in the ISR is unknown. There are no known management plans or agreements in place in the ISR for the species. Their status is listed as Undetermined in the NWT (GNWT ENR 2011c).

Spoonhead Sculpin

Spoonhead sculpins are bottom-dwellers with flat heads, mottled yellowish-brown backs with a whitish belly, and large pectoral fins. They may be up to 14 cm long and live for up to six years (University of Guelph 2011b).

In the NWT, spoonhead sculpins can be found in the Mackenzie River, Great Slave Lake, Rabbitskin River (GNWT, ENR 2011c) and Thelon River system (Evans *et al.* 2002).

Spoonhead sculpins may be found in freshwater and brackish waters. Preferred adult habitat includes swift streams, large turbid rivers and the inshore shallows and also deeper waters of clear lakes (GNWT, ENR 2011c). Young are commonly found in the shallower areas of turbid rivers (Evans *et al.* 2002).

Spawning likely occurs in late summer or fall in water between 4 and 6°C in lakes or streams in water with a maximum depth of 43 m. The spawning site is under a rock, and the eggs are laid on its underside. Males care for the eggs (University of Guelph 2011b).

The diet of spoonhead sculpins includes aquatic insects and crustaceans (University of Guelph 2011b).

Spoonhead sculpins are preyed upon other fish species (University of Guelph 2011b). They are no food fish and their use in the ISR is unknown. There are no known management plans or agreements in place in the ISR for the species. Their status is listed as Undetermined in the NWT (GNWT ENR 2011c).

Trout Perch

Trout perch are thick-bodied fish with deeply forked tail fins and an adipose fin. They are pale olive to silvery with a whitish belly and five rows of black spots on their backs and sides. They can reach lengths of 13 cm, with females being larger than males (Rook 1999). Females reach maturity at one year of age, and they can live for a maximum of four years. Spawning occurs only once per individual fish (GNWT ENR 2011c).

They are found throughout the Mackenzie River basin (GNWT, ENR 2011c) including the Mackenzie Delta and also on the Tuktoyaktuk Peninsula (Evans *et al.* 2002).

The habitats of adults are lakes and sometimes slow-moving streams and river back-water areas. They exhibit lacustrine, adfluvial and riverine life history types, but most are most common in rivers (GNWT ENR 2011c; Evans *et al.* 2002). They are nocturnal and are found in deep water among sticks, leaves and debris during the day and shallower water at night. (Evans *et al.* 2002; Rook 1999).

Spawning occurs in shallow streams with rocky substrates and occasionally in shallow lake margins (GNWT, ENR 2011c). Spawning likely occurs between May and July in the Mackenzie River. The eggs are attached to the substrate. After spawning, males and females die. Eggs hatch after six to ten days

depending on temperature, and YOY and juvenile occupy benthic habitats. Adfluvial juveniles move into lakes and remain there until spawning age; riverine juveniles remain in the river (Evans *et al.* 2002).

The diet of trout perch includes insects and other invertebrates (Evans *et al.* 2002).

Trout perch are a prey species for other fish species such as northern pike and walleye (Rook 1999). There are no known management plans or agreements in place in the ISR for the species. Their status is listed as Undetermined in the NWT (GNWT, ENR 2011c).

Walleye

Walleye have sharp teeth and two dorsal fins (GNWT 2011b). They are dark green or brown with yellow spots and a white belly and they can reach lengths of up to 80 cm (GRRB 2011). Females mature between three and six years of age, and the fish lives for up to 20 years of age (GNWT, ENR 2011c). They may spawn every year or less often (Evans *et al.* 2002).

Walleye are found in the Mackenzie River basin including the Mackenzie Delta. Their preferred habitats are large shallow turbid lakes but they can live in a wide variety of habitats such as large, turbid or clear rivers and streams, and occasionally large clear lakes. They exhibit riverine, adfluvial and lacustrine life history types. Walleye are usually nocturnal (Evans *et al.* 2002).

In the spring, walleye move into shallow shoals or tributary rivers (GRRB 2011). In the Mackenzie drainage, spawning occurs after ice break-up in May in water temperatures of 7 to 8°C. Eggs are typically laid over a rock, sand, gravel, rubble or gravel substrates, though sand or silt may also be used. Water depths may be 0 to 1.3 m and velocities between 0 and 1.695 m/s (Evans *et al.* 2002).

Adfluvial fry move downstream into lakes and remain there until mature and then migrate to spawn. Riverine fry remain in rivers. Fry may prefer habitats with water depths of 0.3 to 1.52 cm and velocities below 0.08 cm/s over substrates of mud, silt, sand and gravel. Junveniles may prefer water depths of 0.91 to 2.13 m and velocities below 30 cm/s. Adults in northern rivers prefer water that is greater than 122 cm in depth and has a velocity below 30 cm/s (Evans *et al.* 2002).

The diet of walley consists primarily of other fish (GRRB 2011).

Walleye are caught in commercial fisheries in the southern NWT and are classified as a game fish in the NWT (CanLII 2011b; GNWT ENR 2011c). There are no known management plans or agreements in place in the ISR for the species. Their status is listed as Sensitive in the NWT (GNWT ENR 2011c).

White Sucker

White suckers are torpedo-shaped and round in cross-section and they have round mouths with thick, fleshy protrusible lips. They are olive on their backs with white bellies, but the fish get darker when spawning. They are bottom-dwellers that grow up to 50 cm in length and weigh on average 10 kg (DFO 2011b).

White suckers are found south of the treeline in the south-western NWT, including throughout most of the Mackenzie River system and potentially the Mackenzie Delta, but may not occur further north than the Ramparts River in the Sahtu Settlement Area, south of the ISR. White Suckers in the Mackenzie River can live for over 11 years, and fish mature at between three to five years (Evans *et al.* 2002).

White suckers occur in rivers, streams and lakes, preferring warm shallow water. Riverine adults prefer clear to slightly turbid water less than 1.5 m in depth with gravel, sand, silt, rubble or mud substrates and sparse vegetation. Younger white suckers overwinter in tributary streams, but adults overwinter in lakes (Evans *et al.* 2002).

White suckers may spawn in rivers and along lake shores, but prefer to spawn in swift streams over rubble or gravel substrate (Evans *et al.* 2002; Rook 1999). Spawning may occur every year or every few years. After hatching, the fry move downstream to shallow fast-flowing streams with gravel such as eddies (Evans *et al.* 2002).

Their diet is composed of aquatic insect larvae, small molluscs, crustaceans and terrestrial worms (Rook 1999).

White suckers are classified as a game fish in the NWT (CanLII 2011b). There are no known management plans or agreements in place in the ISR for this species. White suckers are classified as Secure in the NWT (GNWT ENR 2011c).