Keeyask Generation Project

Environmental Impact Assessment
Public Involvement Program
Round Two

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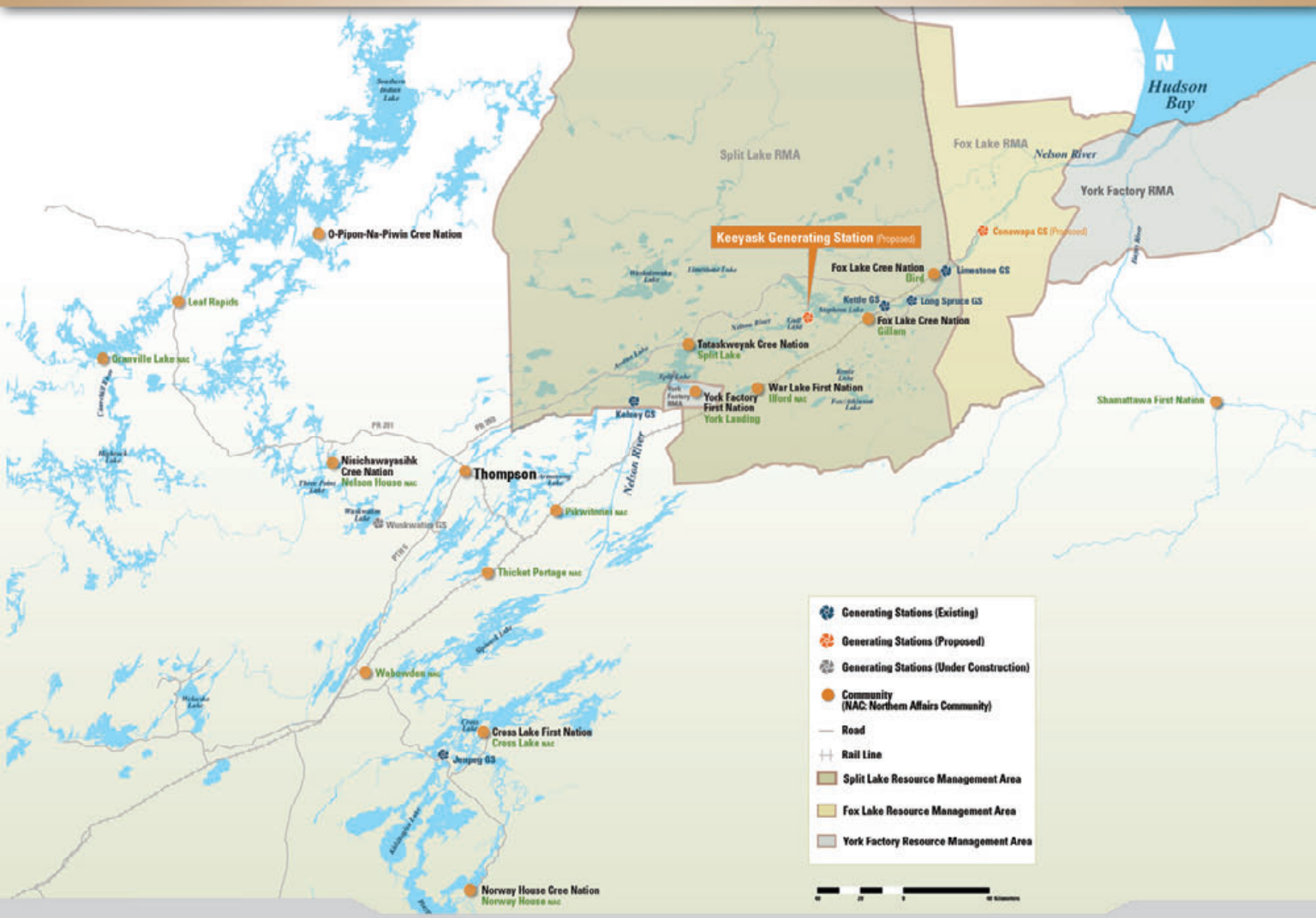
Keeyask Project Location



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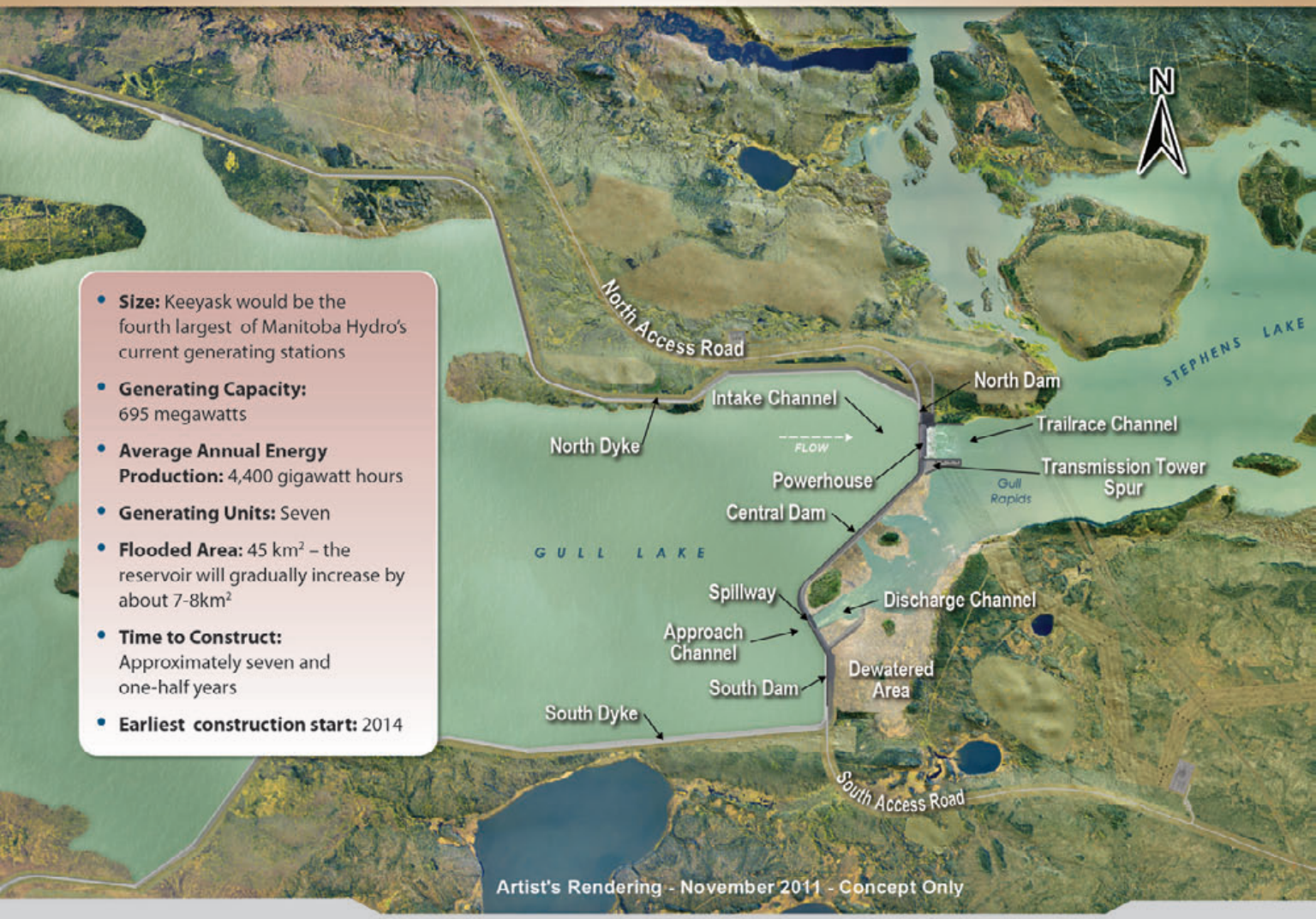
Keeyask Project Overview

- **Size:** Keeyask would be the fourth largest of Manitoba Hydro's current generating stations
- **Generating Capacity:** 695 megawatts
- **Average Annual Energy Production:** 4,400 gigawatt hours
- **Generating Units:** Seven
- **Flooded Area:** 45 km² – the reservoir will gradually increase by about 7-8km²
- **Time to Construct:** Approximately seven and one-half years
- **Earliest construction start:** 2014



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The Partnership

The Project proponent is the Keeyask Hydropower Limited Partnership, comprised of four limited partners and one general partner. The four limited partners are Manitoba Hydro and companies representing the Cree Nation Partners (i.e. Tataskweyak Cree Nation and War Lake First Nation), York Factory First Nation, and Fox Lake Cree Nation. The general partner is a corporation wholly owned by Manitoba Hydro.

Each of the Keeyask Cree Nation Partners has made its own decision to support the Project.

Status of the Environmental Assessment Process

- Since 2001, Manitoba Hydro and the KCNs have collected information to identify ways to avoid, reduce or mitigate potential negative effects and enhance positive effects.
- The Project Proponent has committed to using Aboriginal Traditional Knowledge (ATK) to provide important perspectives on both the environmental and socio-economic implications of the Project.
- Results, including commitments to follow-up and monitoring, will be compiled in an Environmental Impact Statement (EIS) that will be available to the public and submitted for review and approval by federal and provincial environmental regulatory agencies.
- Public hearings are expected.

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Keeyask Public Involvement Program

- Public involvement is a key element of the environmental assessment activities for the Project.
- The public involvement process provides the public, particularly those potentially affected by the Project, with opportunities to receive information about the Project and to provide input on the potential issues and effects.

Round One

Round One completed in 2008, provided an introduction to the Project and identified issues and concerns.

Round Two
Current Round

Round Two offers participants with an opportunity to provide input on preliminary results regarding the biophysical and socio-economic effects of the Project and to offer suggestions for minimizing or avoiding potential negative effect

Round Three

Round Three, will be used to review the completed Environmental Impact Statement.

Summary of What We Heard in Round One

- Communities were positive about potential employment and training opportunities associated with the Project and provided comments on how best to participate in this opportunity.
- Concerns were raised about effects of the Project on various fish and animal species (e.g., sturgeon, caribou).
- Concerns about potentially elevated mercury levels caused by Project flooding were raised by a number of northern communities.
- Concerns were raised about Project effects on resource users (e.g., trappers) and cultural sites (e.g., burial sites) and the need to have these issues considered in the environmental assessment.

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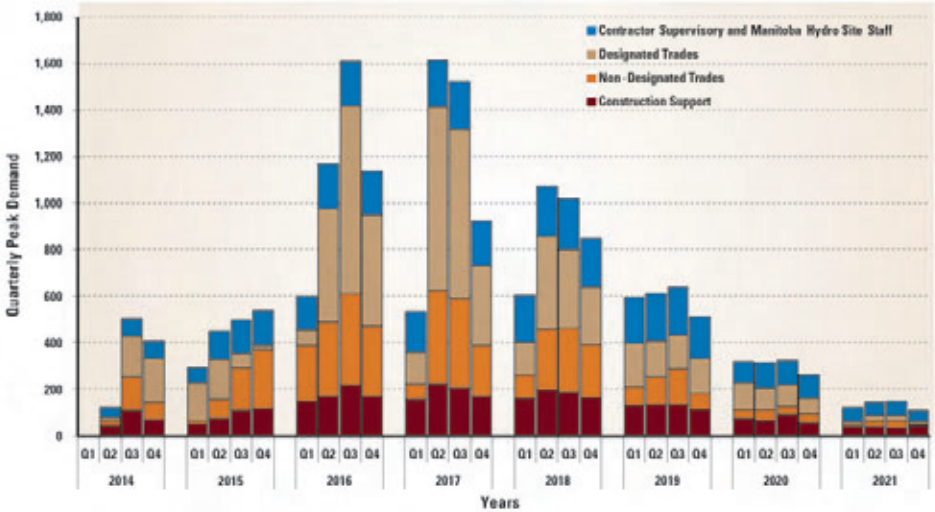
Project Effects and Mitigation: Employment and Training



As shown in the graph, the peak employment years are during the mid-construction period from 2016 to 2018. There will also be seasonal peaks from Q2 and Q3 (April to September) when the largest workforce of approximately 1600 workers is expected in 2016 and 2017. Workers from the KCN communities are projected to account for between 7% and 16% of the total construction workforce.

Source: Derived from data provided by Manitoba Hydro, 2011.

Note: Employment opportunities in 2021 (Q3 and Q4) are for the decommissioning of temporary supporting infrastructure. Estimated construction schedule is subject to change by contractor.

Should the Project proceed, it is expected to generate:

- Over 4,200 person years of direct construction employment;
- Employment opportunities available during the Project's construction period:
  - *Designated trades (e.g., heavy equipment operators and truck drivers);*
  - *Technical or professional occupations (e.g., administration); and*
  - *Construction support (e.g., catering and security).*
- For the operation phase, an estimated 46 new full-time local positions.

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Project Effects and Mitigation: Employment and Training

A training program was conducted for northern Manitoba Aboriginal people for employment on the Project and northern needs.

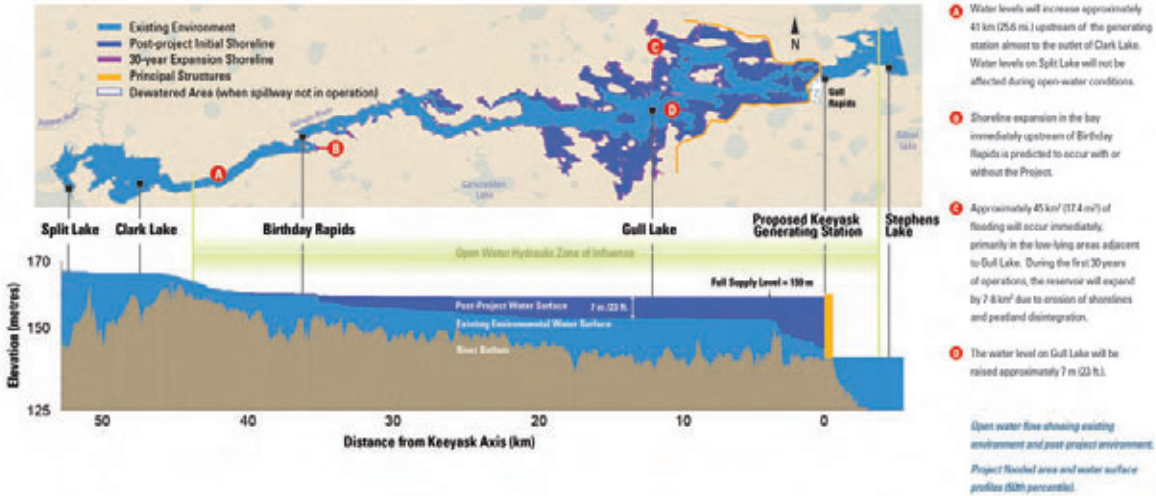
- Between 2002 and 2010, over 1,000 Aboriginal people completed occupational training, life skill training and skills upgrading.

Steps being taken to address challenges and uncertainties associated with Project employment, including the following:

- An Advisory Group on Employment will be tasked with receiving, reviewing, and finding solutions to address challenges to construction employment and to lower turnover rates. Employee profiles will be created to increase communication and awareness of employment and job availability;
- A community-based mechanism will be established to assist getting qualified KCN workers to the job site; and
- Shuttles from Gillam and Thompson will transport employees to the job site.

Tracking of both KCNs and Aboriginal Northern Region employment will be part of a socio-economic monitoring plan. A monitoring plan will track whether the negotiated employment targets are being met.

Project Effects and Mitigation: Sediment and Erosion



- During construction, effects on erosion and sediment after mitigation are expected to be small in the main river channel as they will be addressed through appropriate construction management.
- During the first 30 years of operation the reservoir will expand in area by about 7-8 km^2 because of shoreline erosion and peatland disintegration.
- Additional woody debris will be managed through the Waterways Management Program.
- During operation, there would be less erosion of shorelines immediately downstream of the Project than would occur without the Project.
- During operation, there would be less suspended sediment in the water in the main channel through the reservoir and in the water discharged downstream to Stephens Lake than would occur without the Project.

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Project Effects and Mitigation: Ice and Water Conditions

- During Project operation a thinner and smoother ice cover will form on Gull Lake to approximately 25 km upstream of the Project and downstream of the Project into Stephens Lake.
- A thicker, rougher ice cover will develop upstream of Gull Lake and will progress upstream of Birthday Rapids, but will end downstream of Clark Lake.
- Winter water levels on Split Lake could be slightly higher (approximately 0.2m) during very low flow conditions.
- Approximately 800 m of open water will exist immediately downstream of the powerhouse.

Looking east at Gull Rapids in December of 2004.

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Project Effects and Mitigation: Water Quality

- Project construction, flooding of terrestrial areas, erosion, and changes in water flows/levels can alter water quality by allowing materials to enter the water.
- During construction, effects to water quality will be managed to avoid harmful effects to aquatic life.
- The largest effects to water quality will occur in the first years after the station is constructed. In shallow flooded areas, the concentrations of many substances, such as suspended sediments, nutrients (e.g., nitrogen and phosphorus), and metals will increase due to the decomposition of vegetation and the breakdown of peat. In winter, the amount of dissolved oxygen in the water will decrease under ice cover, and reach very low levels in bays away from the main flow of the river.
- There will be little or no detectable change to the water quality in the main flow of the Nelson River and downstream due to the large volume of water flowing in the river. In the long term, by contrast, the concentration of suspended sediments in the reservoir and downstream in Stephens Lake is expected to be slightly lower than at present because more sediment will settle in the reservoir.
- Regular monitoring of effects to water quality will occur during the construction and operation phases of the Project.

Project Effects and Mitigation: Mercury, Fish and Human Health

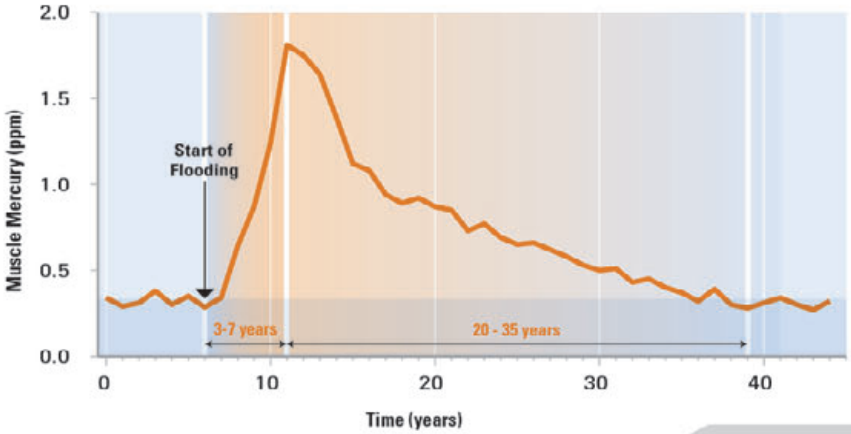
Country food is an important part of the diet in northern Aboriginal communities.

While mercury is normally found in all fish, studies of past hydroelectric projects have shown that fish from newly flooded reservoirs have substantially elevated mercury concentrations.

Anticipated Effects During Project Operation

- Mercury concentrations in fish are predicted to increase both in the Keeyask reservoir and Stephens Lake reaching maximum levels within 3 to 5 years in lake whitefish and 4 to 7 years in northern pike (jackfish) and walleye (pickerel) of an average adult size.
- Maximum levels of mercury are expected to persist for a few years then begin to decline.
- It may take about 20-30 years until concentrations in these fish species return to levels in the reservoir similar to those observed in Gull Lake before flooding.

Typical Time Course of Mercury Concentrations in Predatory Fish After Reservoir Flooding in Northern Manitoba



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Project Effects and Mitigation: Mercury, Fish and Human Health

Proposed Mitigation and Monitoring Activities

The KCNs have each negotiated individual Adverse Effects Agreements that enable them to harvest country foods in areas not affected by flooding.

In addition to these programs, the following measures will be undertaken:

- Regular monitoring of mercury concentrations in fish in Gull Lake and Stephens Lake after flooding the reservoir; and
- A voluntary collection of samples of wild game, waterfowl, plants and gull eggs will also be tested for mercury to confirm if, as expected, mercury concentrations will continue to remain acceptable for consumption.

The Mercury and Human Health Technical Working Group also prepared a communication strategy for the KCNs, Gillam and other resource users in the Project area. As part of the communication strategy, a series of products have been prepared for use in local communities to inform people of the issue and provide recommendations on eating certain fish species.

Project Effects and Mitigation: Lake Sturgeon

Due to historic population declines caused by commercial over-harvest and past hydroelectric developments, and concerns about a continuing decline in numbers, the Partnership has focused considerable effort on finding ways to mitigate effects of the Project on lake sturgeon.

Monitoring of lake sturgeon after the reservoir is formed will determine whether or not habitat for spawning and newly hatched sturgeon is present in the reservoir. If not, the Partnership has identified ways to create these important habitats in new locations.

Habitat at Birthday Rapids altered; potential reduction of spawning habitat

Young of year habitat in Gull Lake will be lost; shift in foraging areas

Gull Rapids will be eliminated; loss of spawning habitat

Potential reduction of sub-adult foraging between Gull Rapids and Stephens Lake

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Project Effects and Mitigation: Lake Sturgeon

Young-of-the-year lake sturgeon.

Mitigation Measures Include the Following

- Downstream of the generating station new spawning habitat will be constructed. Lake sturgeon use of this structure will be monitored and modified as required.
- Monitoring of lake sturgeon upstream of the generating station will determine whether or not spawning and rearing habitat needs to be created.
- Stocking will occur in the Nelson River between the Kelsey and Kettle generating stations.

Key Components of the Lake Sturgeon Stocking Program

- A new hatchery will be built in the lower Nelson River area of Manitoba.
- Local fish will be used as the source of brood stock for the hatchery.
- Fish of a range of ages, from a few weeks to a year, will be released.
- The program will continue in the long-term until numbers reach levels where the populations are self-sustaining.

Large adult lake sturgeon captured at the mouth of the Odei River in 2008

As with other parts of the mitigation program, monitoring will be used to determine the success of the stocking program and whether modifications are required

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Project Effects and Mitigation: Caribou

Barren-ground and coastal caribou migrate from Nunavut and Ontario and spend the winter in Manitoba's boreal forest, and partly, in the Keeyask region. Some animals remain in this area year-round, calving in the spring on islands in lakes and in peatland habitats.

Because population sizes and migratory routes change over time, the number of caribou varies seasonally. The Manitoba government does not identify the caribou in the Keeyask region as SARA-listed boreal woodland caribou; however, some local First Nation Members describe a woodland caribou type that is distinct from the coastal and barren-ground caribou.

Coastal caribou in the Keeyask region.

Summer resident bull caribou in the Keeyask region.

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Project Effects and Mitigation: Caribou

Potential Project effects on caribou were reduced by changes to the Project design, including the routing of access roads to avoid known caribou calving habitat and to provide a greater buffer from potential noise disturbances.

Additional mitigation measures, where feasible, will include the following:

- Blasting and other noisy construction activities near quarries will be limited from late April to the end of June in the vicinity of high quality caribou calving habitat to minimize effects on calving females and their young;
- To reduce potential vehicle collisions, signs will be posted at specific areas along the access roads, warning users of caribou activity;
- Workers will not be allowed to have firearms in camps and at work sites to prevent hunting.

Monitoring of effects on caribou will take place during the construction and operation of the Project and will include aerial surveys, ground tracking, ATK and resource user information.

Barren-ground caribou in the Keeyask Region.

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Do You Have Questions, Concerns or Issues About the Proposed Project?

We invite you to talk with one of the Project representatives at the meeting today or to contact us at the address below with any questions, concerns or issues you may have about the proposed Project.

Next Steps

The Environmental Impact Statement for the Project is expected to be filed with regulatory agencies in late spring 2012 and will be available through the Province's public registry. The EIS submission will incorporate input received during the public involvement process.

Round Three of the Public Involvement Program is expected to occur in the fall of 2012.

Contact Information

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