



Hydro Relicensing Program Overview

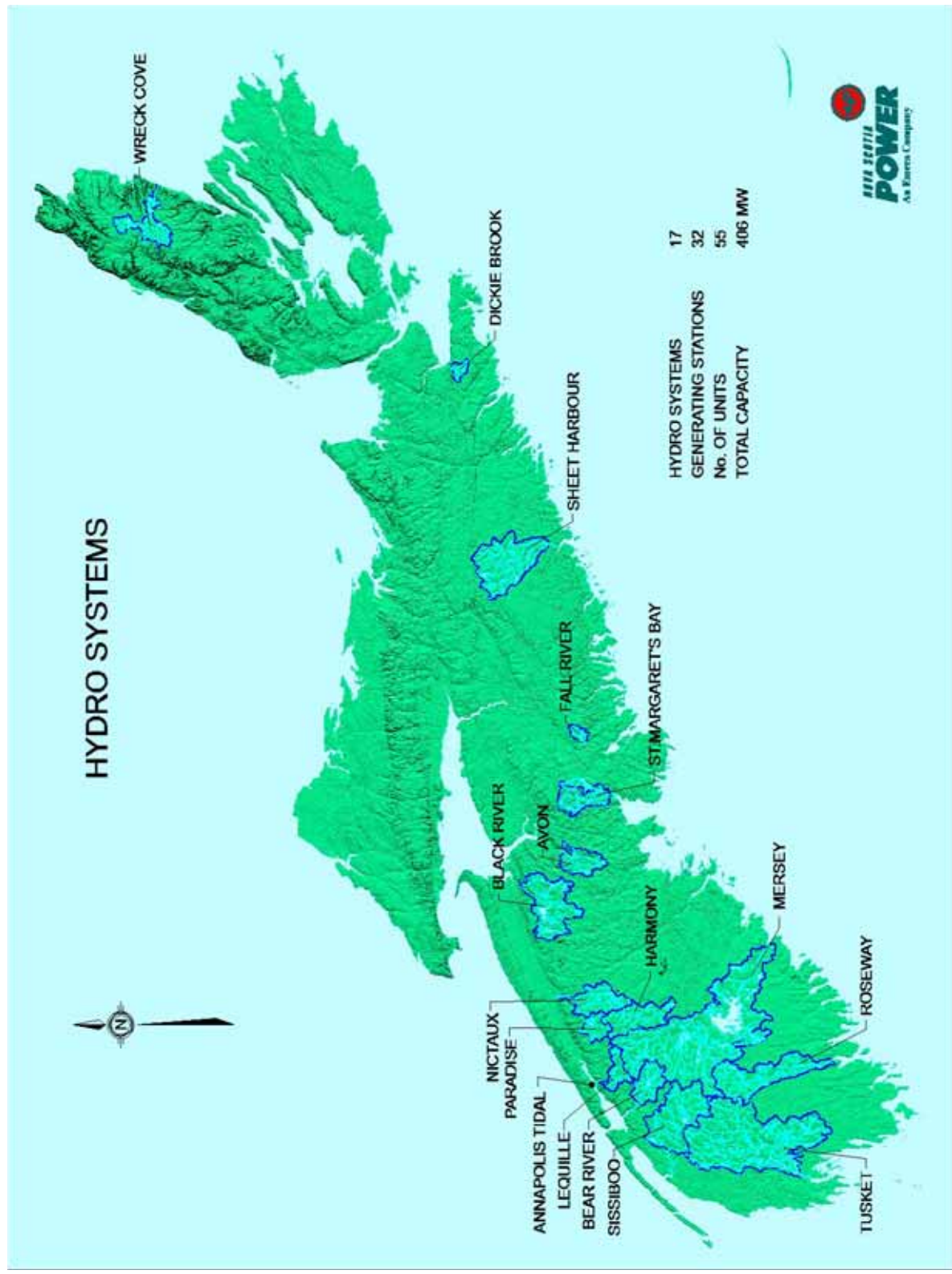
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Background



- Nova Scotia Power Inc. (NSPI) has operated its 32 Hydro Generating Stations, located on 16 watersheds throughout the province, with consideration for the environment and in accordance with Water Approvals initially issued under the Water Act.
- The operation of hydro facilities is directed toward achieving a sustainable balance between public & employee safety, protection of the environment, generation of electricity, and recreational uses of the watercourse.
- Hydro accounts for approximately 18% of NSPI's capacity (at 406 MW) and 8% of total generation.

NSPI's Hydro Systems



NSPI Relicensing



- Most of NSPI's Hydro Systems were developed between 1920 and 1950 under public policy decisions of the day; including the objective of providing Nova Scotians with electricity and in support of the war effort (WWII).
- All these Systems were initially approved under the Nova Scotia Water Act and other regulatory approvals.
- The relicensing of hydro systems under the Water Act had been carried out in a straightforward, abbreviated manner with little or no public involvement or environmental studies.

NSPI Relicensing



- Systems now operate under Water Approvals issued under the Environment Act, which came into force in 1994.
- The first 'round' of relicensing commenced in 1995 with 12 Hydro Systems relicensed over the next 8 years.
- The second round of relicensing began in 2005 with 14 Hydro Systems that had Approvals due to expire between 2006 and 2013 (including the 12 previously relicensed).

NSPI Relicensing

- The relicensing process takes place over a two-year period and includes the following elements:
 - Environmental Studies
 - Review of existing information
 - Consolidation of operating information
 - Extensive field studies/monitoring
 - Stakeholder Consultation
 - Early & ongoing engagement with known stakeholders
 - Public open houses
 - Review of the results of studies
 - Discussion of water management implications
 - Regulatory Consultation
 - Review scope of relicensing process/studies
 - Review of the results of studies
 - Discussion re: water management scenarios

NSPI Relicensing

- NSPI has proposed a more streamlined approach to environmental studies on recently relicensed Hydro Systems, based on collecting key parameters at representative sites to monitor the health of the aquatic ecosystem over time.
- Recognizing the dynamic nature of these ecosystems, this baseline monitoring can be supplemented by focus studies as required to address ongoing or emerging issues.
- There is a more concerted effort to identify species of conservation concern (also SAR) and to ascertain if they are affected by NSPI operations. The provincial Department of Natural Resources is consulted in these matters.
- On a system-by-system basis, NSPI consults with the Nova Scotia Heritage Division regarding sites of cultural significance.

Environmental Studies



- Studies conducted under the relicensing program are intended to provide a snapshot of environmental conditions across a watershed with a special focus on aquatic health and productivity, the scope of which includes:
 - The effects of water management strategies on aquatic habitat, upstream and downstream of dams, specifically relating to:
 1. flow management
 2. reservoir management
 3. fish passage, and
 4. species at risk.
 - The effects of other land use practices and factors that contribute to prevalent environmental conditions on the watershed (e.g. acid precipitation, geology).

Environmental Studies



- Surveys are conducted in both reservoir and stream habitats to evaluate and describe their relative aquatic health using fish and water chemistry as the key indicators. Aquatic health and habitat productivity components include:
 - Water Quality (overall chemistry / nutrient levels)
 - Physical Habitat (reservoir bathymetry / shoreline vegetation / littoral zone characteristics and stream morphology / hydrology / riparian characteristics)
 - Biology, Ecology (fish species diversity and distribution)
- Additional surveys may be conducted where focus studies are required.

Common Issues

- The most common issues raised and addressed in the relicensing process to date:
 - fish passage
 - instream flow releases
 - reservoir elevation (especially in cottage season)
 - habitat impacts
 - commercial fishing (e.g. alewife and A. eel)
 - fish species recovery (e.g. Atl. salmon and Atl. Whitefish)
 - recreational access
 - recreational fishing (e.g. smallmouth bass, trout)
 - flowage rights
- In many cases, constructive, straightforward measures were identified and implemented
- Other situations may call for enhanced monitoring

Fish Passage Improvements

- Fish passage improvements that have resulted from relicensing include:
 - Construction of eel fishway at Tusket in conjunction with DFO Diadromous Fish Division
 - Construction of second bypass fishway at Malay Falls (Sheet Harbour)
 - Construction of new salmon trap for monitoring at Ruth Falls
 - Development of trap & truck salmon monitoring program at Ruth Falls in conjunction with DFO
 - Refurbishment of a louver assessment facility at Ruth Falls (Sheet Harbour)



Fish Passage Improvements



- Assessment at Ruth Falls with DFO (Peter Amiro, Phil Hubley) evaluating flow requirements for fish passage
- Construction of three additional baffles to the Ruth Falls fishladder for improved fish passage efficiency
- Reconstruction of Lanes Mills fishladder (Black River)
- Tusket powerhouse fishladder reconstructed to new design standard
- Carleton fishladder modified for extended operation



Fish Passage Improvements



- Fish passage improvements at White Rock include:
 - Relocation and construction of fishladder
 - Construction of 3 bypass fishways to replace single fishway
 - Construction of angled bar rack (ABR) for behavioural guidance to downstream fishway
 - Construction of assessment facilities on all four fishways
 - Construction of a new salmon trap for monitoring



Important Points

- Hydropower is a valuable and renewable means of producing electricity.
- Every MWh not generated with hydro requires production of electricity by another means, usually with fossil fuels.
- While hydro is a relatively low impact form of power generation, NSPI is aware of the need to further reduce residual impacts and enhance its benefits on an ongoing basis.
- The relicensing process provides a reasonably comprehensive occasion for evaluation of the present conditions, balances and commitments for a particular hydro system.

A Legacy Resource



A Legacy Resource



Bathymetry Example – Lumsden Pond

