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**Abstract :**

The La Grande Complex riparian and aquatic vegetation monitoring program, which was conducted from 1979 to 1999, concerns the riparian and aquatic habitats of sections of La Grande Rivière with regularized flow, the riparian zones of reservoirs, the rivers with reduced flow and the diversion waterways of the hydroelectric complex phase I (1973-1985) and II (1987-1996). Methods and data analysis used for the monitoring program are described. Different remedial measures are described and evaluated. On shores of the reservoirs, clearing has enhanced growth of the vegetation above the maximal level of water and accelerated the sweeping away of wooded debris; planting of herbaceous and shrubs species has been proved to be ineffective in the reservoirs' tidal zones although the dyking up of an inlet has promoted the development of new riparian habitats freed from the reservoirs' influence. Aerial sowings have allowed the fast growth of a vegetation cover preventing sediment runoffs from the exposed banks of rivers with reduced flow, but plantings of shrub and grass species could not help to consolidate these banks ; construction of weirs has reduced the effect of diversion in some river sections and improved the navigability. The patterned clearcuttings of riparian shrub stands on La Grande Rivière shores have greatly improved the habitat quality especially for snowshoe hare and moose. Creation of small islands to improve waterfowl nesting and of ditches for burrowing by muskrat in a selected bay of La Grande 1 reservoir has not yet produced the anticipated results; the observed increase of productivity was mainly caused by the floating of several peat blankets from flooded peatlands ; sowings have accelerated the spread of vegetation and willow plantings were successful. Results from some field experiments conducted in a fen (e.g. drainage, dyking up, transplantation of herbaceous species) suggest that the global productivity of such sites can be increased. On the shores of reservoirs, water level management is not favourable to establishment of riparian vegetation, only the floating peat blankets being associated with productive habitats. In rivers with reduced flow and derivation ways, riparian habitats are evolving towards an equilibrium following the new environmental conditions; these habitats will however be of smaller extent. The frequency and the cover of the aquatic vegetation of La Grande Rivière have been reduced; these changes appear to be related to the daily water level fluctuations.

**Key words :** Riparian vegetation, aquatic vegetation, environmental monitoring, mitigation measures, La Grande complex.

**Distribution list :** Ministère de l'Environnement du Québec, James Bay Advisory Committee on the Environment, Review Committee, Cree Regional Authority, Cree communities, Eeyou Corporation, Makivik Corporation, Société de la faune et des parcs du Québec, Société d'énergie de la Baie James, Société de développement de la Baie James, Municipalité de la Baie James, Hunting, Fishing and Trapping Coordinating Committee, Canadian Electrical Association, Environment Canada, Fisheries and Oceans Canada, Unités d'environnement et de relations avec le milieu des divisions d'Hydro-Québec, Documentation centre of Direction Environnement d'Hydro-Québec.

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