

NETUKULIMK TREATY RIGHT PROTECTED FISHERIES  
SPECIES-SPECIFIC INTERIM  
KATEW (ELVERS, AMERICAN EEL, ANGUILLA ROSTRATA)  
APPENDIX 1

As declared by:

Acadia First Nation

Annapolis Valley First Nation

Bear River First Nation

Glooscap First Nation

MARCH 2023

## Appendix I – Elver Harvest Management considerations

*The East River may not be a good base from which to extrapolate elver returns for other Maritime province rivers: it has a low discharge, a discharge low for its drainage area, a moderately low pH, it may be less attractive to elvers than rivers with better environmental quality, and current patterns may bring fewer elvers to Atlantic coastal regions of Nova Scotia than to the lower Bay of Fundy.*

*The run of elvers to the East River, Nova Scotia may be most useful as an index of annual variability in elver run size to Atlantic coastal streams of Nova Scotia and a source of data on the biological characteristics of elvers.*

Jessop, B.M. 1995a. Justification for, and status of, American eel elver fisheries in Scotia-Fundy Region

*Catch quotas usually limit exploitation to biologically and managerially acceptable levels . Exploitation rates of 40-60% are often viewed as acceptable but the issue is moot when population size cannot or has not been measured . Elver recruitment to a river is usually unknown as is the population of large eels in, or the spawning escapement of silver eels from, any river . Insufficient information exists to set biologically meaningful catch quotas for elvers or larger eels . A quota set on an arbitrary but best judgement basis seems preferable to no quota, as for yellow and silver eels, although stage (elver, yellow, silver eel) and area (estuarine, freshwater) of exploitation (but not degree of exploitation) is irrelevant for eels .*

*It might be argued that the elver fishery quota should be proportional to the fishing area, on the assumption that elver abundance is proportional to the drainage area or discharge of a river or series of rivers in the licensed fishing area . Evidence presented above suggests that the assumption is false that annual elver recruitment is of similar density or abundance over wide geographic areas and among years.*

*The new eligibility criteria will accommodate native fisheries, CORE eligible fishers, and requirements of the aquaculture industry .*

Jessop, B.M. 1996. Review of the American eel elver fisheries in Scotia-Fundy, Maritimes Region. DFO Atlantic Fisheries Research Document 96/04.

*Social, cultural and economic objectives*

*4. Culture and Sustenance: Respect Aboriginal and treaty rights to fish.*

Elver integrated fisheries management plan (evergreen)- Maritimes Region

# DRAFT SPR70 Model

Bradford, R.G., Cook, A.M., and Smith, S. 2022. Assessment of the Maritimes Region American Eel and Elver fisheries. DFO Can. Sci. Advis. Sec. Res. Doc. 2022/009. v + 76 p.

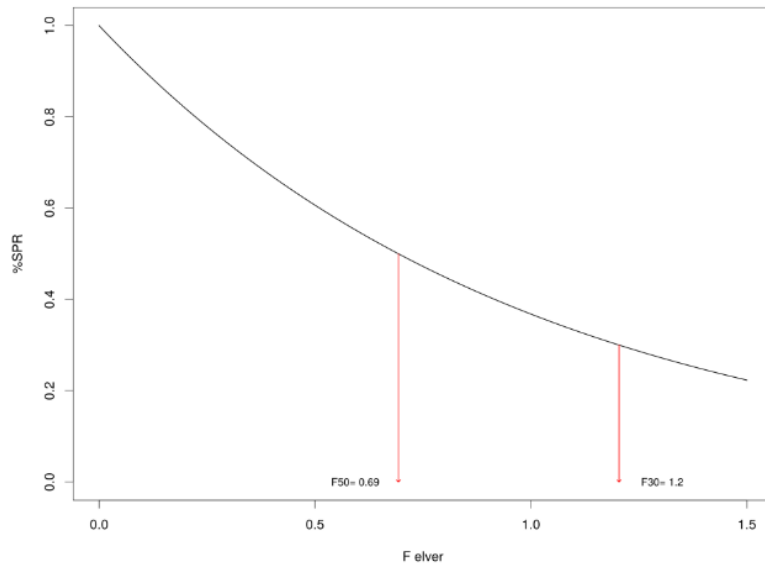


Figure 22. Percent Spawner biomass Per Recruit versus Fishing Mortality (F) for elver fisheries. F at SPR<sub>30</sub> and SPR<sub>50</sub> are shown.

Using this graph from the 2022 assessment, we can estimate that SPR70 will be a fishing mortality of below 50% of the annual run, closer to 0.35 and 0.40 or 35-40%. We can calculate 30% of the maximum harvest but it is not the same as the SPR70 (The curve in this relationship in the graph below, shows it is not a linear relationship between SPR and fishing mortality.)

SPR70 would be much more conservative than SPR 50 or 30. SPR 30 involves harvesting the most and is the maximum. SPR30 and 50 are standard in fisheries management, however, being extra careful makes sense considering the uncertainties over the lifespan of the eels and that this is a new model, etc. DFO proposes to be cautious by not expanding the area of the elver fishery but is equally valid to be more cautious river by river while perhaps expanding the areas fished.

We can take the values for each watershed that you provided me below and convert back to total run size using a conversion factor that DFO provides for SPR50 and SPR30, then take 35-40% of the total run size to estimate SPR70 in the rightmost column.

**Conclusion:**  $SPR70\ Kg = 0.399\ SPR70\ Kg/Km^2 \times Area\ Km^2$

River	Area (km2)	Pre-fishery abundance (kg per square meter)	Pre-fishery Abundance (kg)	SPR 30 kg per square meter	SPR 30 (kg)	SPR 50 (kg per square meter)	SPR 50 (kg)	DFO Maximum	40% of Annual run (Approx for SPR70)
East-River Chester	137	2.33	319.21	1.61	220.57	1.14	156.18	220.57	54.8
Cornwallis River: Drainage Area (km2)- 249 km2, Maximum recommended removal determined by DFO – 373 Kgs	249	2.33	580.17	1.61	400.89	1.14	283.86	373	99.6
Downeys River: Drainage Area (km2)- 40 km2, Maximum recommended removal determined by DFO – 59 Kgs	40	2.33	93.2	1.61	64.4	1.14	45.6	59	16
Hardings Brook: Drainage Area (km2)- 19 km2, Maximum recommended removal determined by DFO – 29 Kgs	19	2.33	44.27	1.61	30.59	1.14	21.66	29	7.6