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Damsa Integrated Resources Management Inc.

American Fisheries Society Ontario Chapter, Annual Meeting
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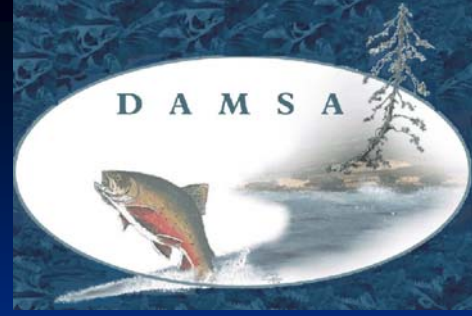
Vulnerability of Trophy Brook Trout To Angling

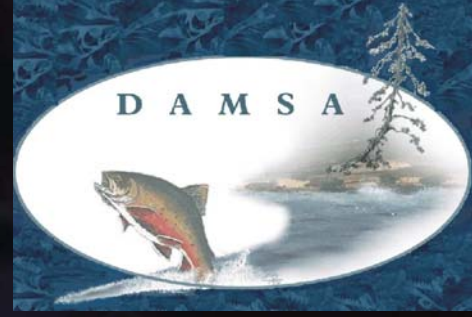
Summary



Vulnerability of Trophy Brook Trout to Angling in a Small Shield Lake

- Fly angling with a single rod was employed to remove trophy brook trout from an 8 ha shield lake in the spring of 2003. After five weeks of intermittent recreational angling, residual fish were gill netted. The lake, initially devoid of sport fish, was stocked with Lake Nipigon strain trout as part of an initiative to develop trophy brook trout fisheries for potential tourism applications. The lake was designated as a provincial sanctuary during the study. Angling removed 70 % of the total number of fish captured. Over half (71) of the 122 trout removed were angled in less than 10 rod hours indicating large brook trout (average = 1.1 kg (2.4 pounds)) were very vulnerable to angling. The standing stock at the beginning of the removal exercise was calculated to be 16.6 kg/ha, almost identical to the average standing stock (16.3 kg/ha) observed in nine other small brook trout lakes in north eastern Ontario that had been placed under sanctuary status (Armstrong and Davis 1995).

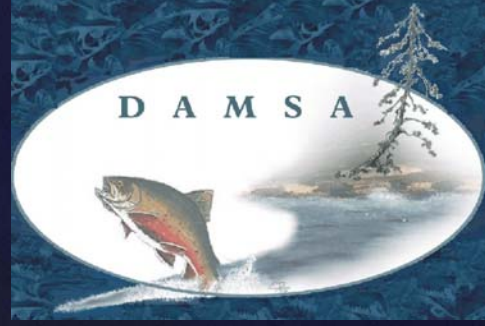
Background



- Damsa is conducting research on trophy brook trout fisheries.
- Focus on two key areas:
  - (1) the use of sexually manipulated trout stocks (sterile, monosex).
  - (2) the creation of new trophy waters by improving poor habitat with Refugia to help trout through critical environmental windows.
- Creation of "wild" trophy brook trout fisheries are some of the most difficult of salmonid fisheries to create. Success here would suggest that the technology developed in this project could be applied successfully to other species.

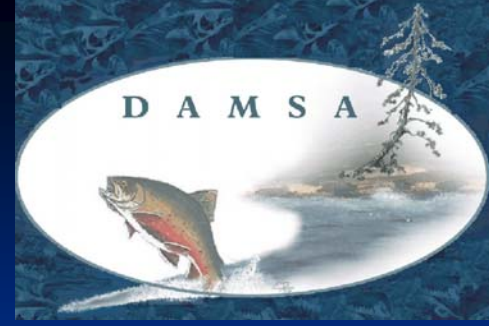
Scott Smith

Background …2

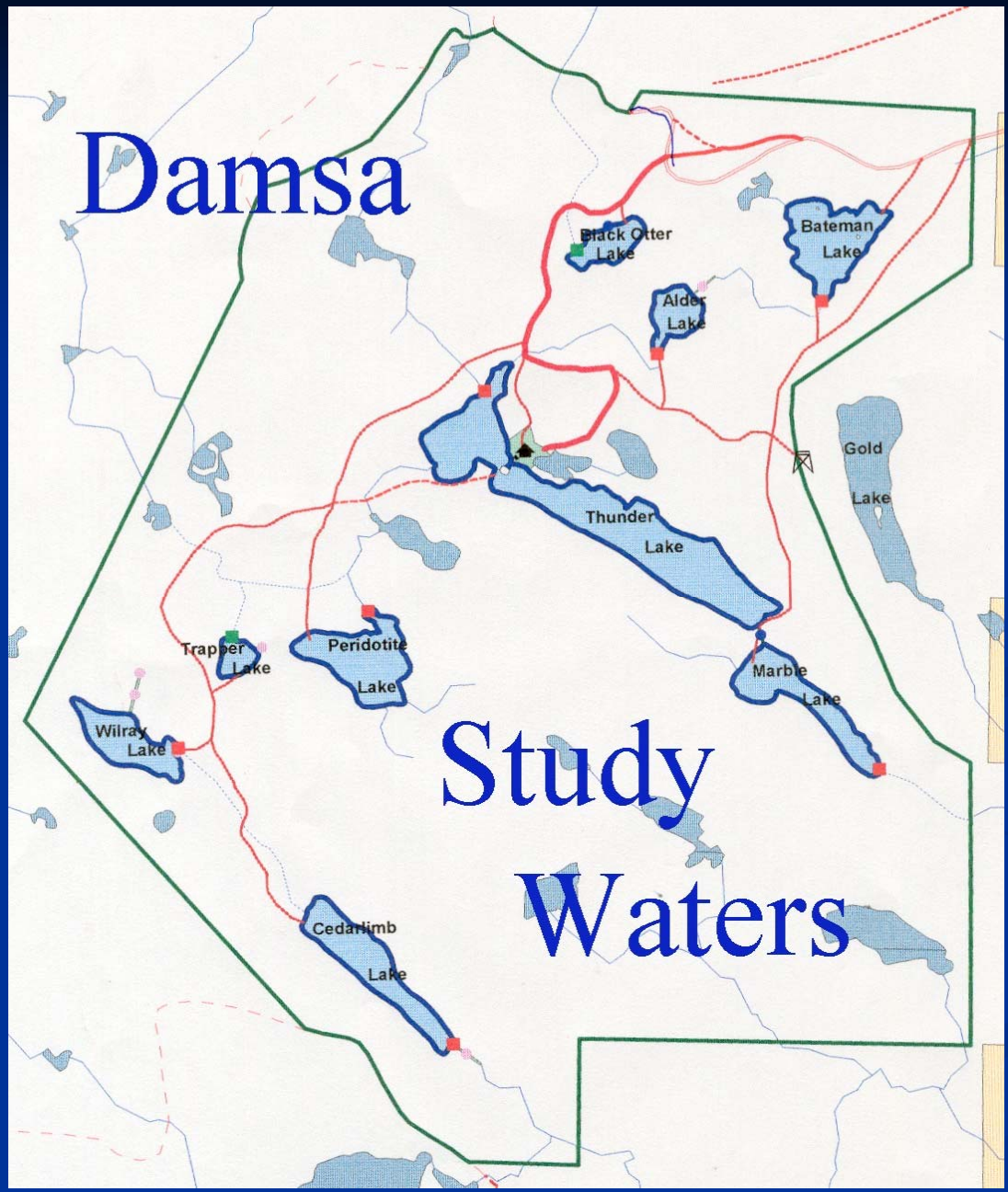


- Fisheries developed in lakes devoid of sport fish, receiving little or no use by the general public. Not managed for sport fisheries by government of the day.
- Fisheries intended for tourism applications - fee paying clients.
- Field studies undertaken 1992-2003

Gord Ellis



Damsa

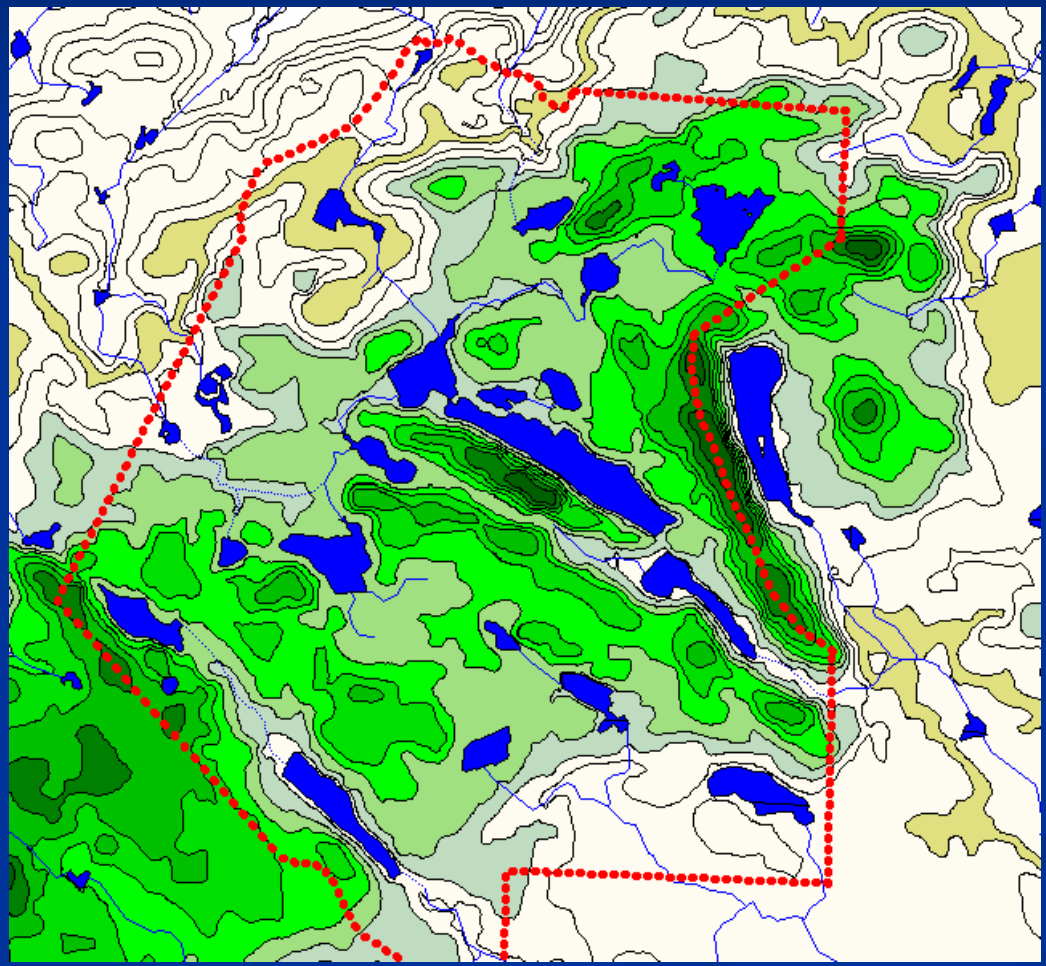


Study Waters

N

Scale 1:30,000

Topography



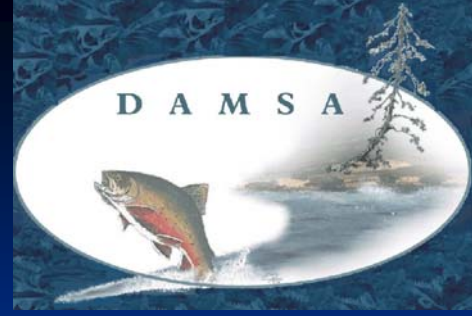
N

Scale 1: 35000

Colour increments of 10 metres

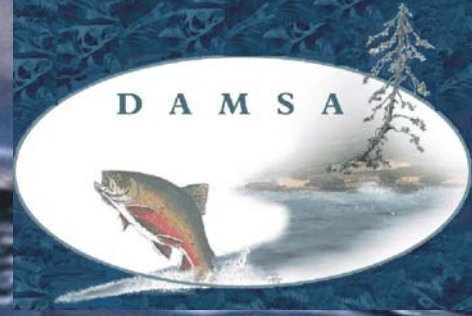
The Lakes: A Food Factory - Marble
20 Acres (8 ha) Max Depth 12 ft (3.5 m)

Selected Characteristics of Marble Lake



Elevation (metres)	479
Watershed (hectares)	76
Lake Area (hectares)	7.3
Maximum depth (metres)	4.0
Mean depth (metres)	1.8
Average flow (litres/second)	7.2
Secchi depth (metres)	2.0
pH (- log H^+)	7.0
Alkalinity (mg/l)	133
Dissolved solids (mg/l)	190
Morphoedaphic index	105
Littoral zone (percent)	100
Fish species	5-spine sticklebacks, red belly dace

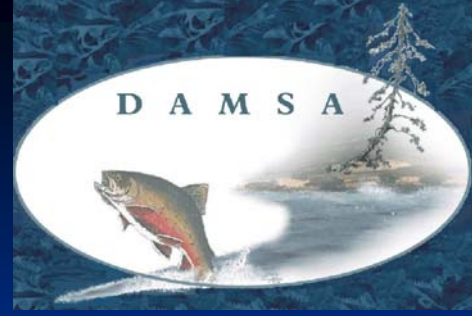
Methods

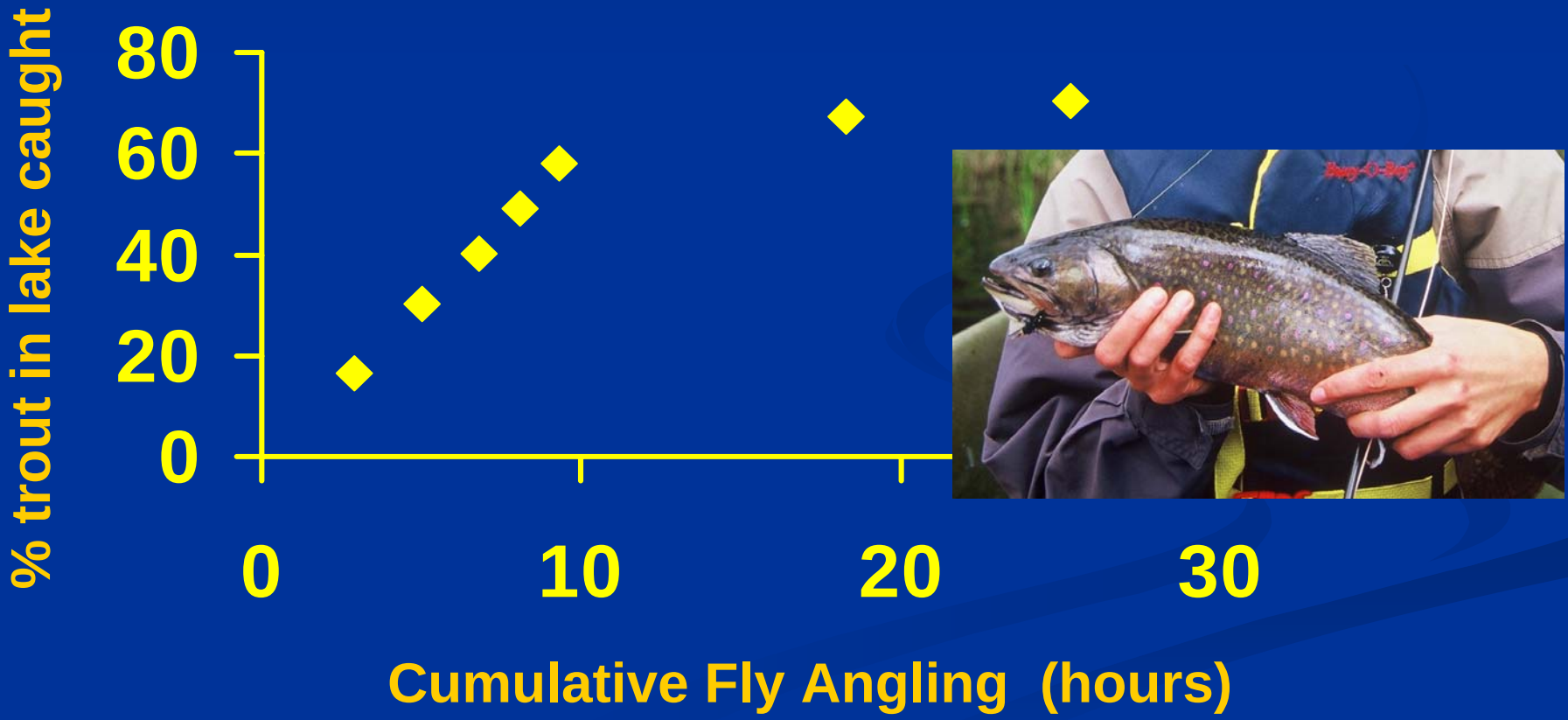


- Lake stocked with lake Nipigon strain brook trout in March 2000
- Fish removed May, June 2003
- Single fly rod employed
- Gill nets used to remove remaining trout

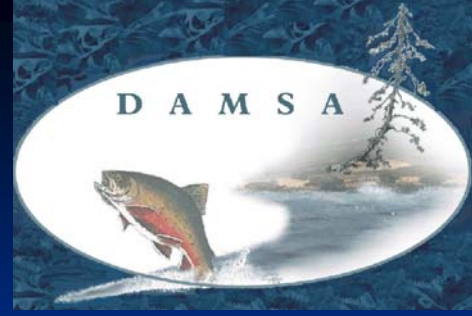
The Reluctant Data Collector (DJP)

Vulnerability of trophy brook trout to angling in a small Shield Lake



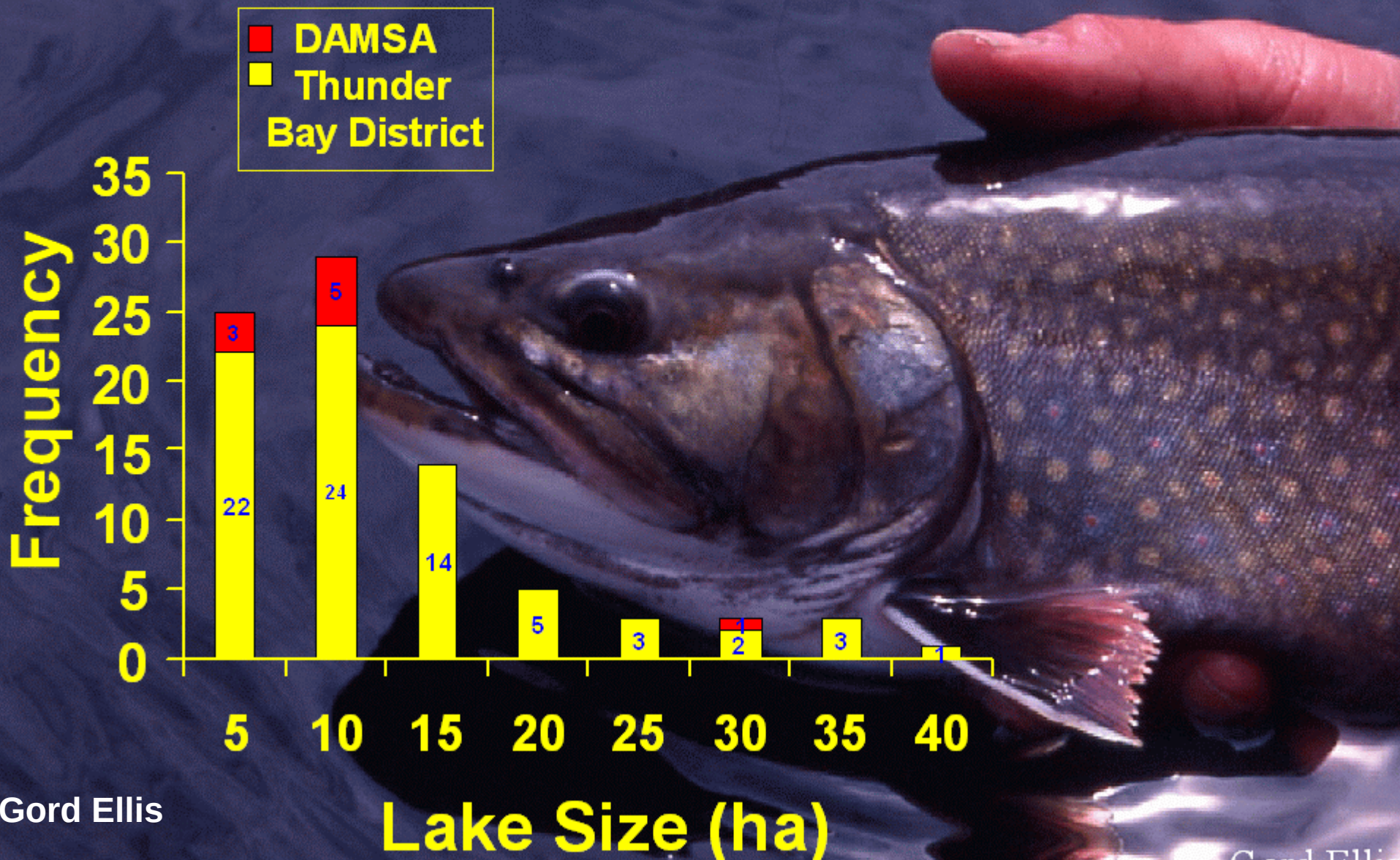


Brook Trout Yields in Small Shield Lakes in Ontario



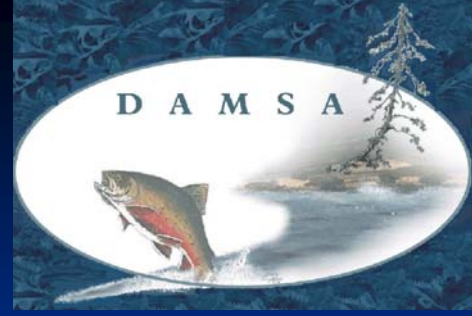
Lake	Outlet	Yield (kg/ha/yr)		Standing Stock	Area (ha)	Reference
		mean	range	(kg/ha)		
Marble	open	5.20		14.80	8.0	1
Armitage	none	21.06		45.74	4.4	2
MvEvay #18	none	6.61		20.80	3.5	2
Seahorse	none	-0.94		6.18	9.1	2
Burt #5	none	1.09		11.47	9.2	2
Davidson #2	none	-1.70		5.84	3.5	2
Driscoll	none	8.16		20.16	3.8	2
Briere	none	-3.15		3.25	2.8	2
Giunta	none	10.45		29.71	2.8	2
Moose	none	-4.99		3.48	3.5	2
L. Mykiss	open	2.8	-1.4 to 4.5		9.3	3
Crystal	open	5.80		12.30	36.4	4
Dickson	open	2.00			9.0	5

Lake Size Comparisons



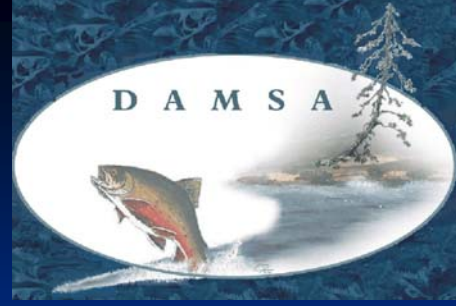
Gord Ellis

Some Resource Management Implications



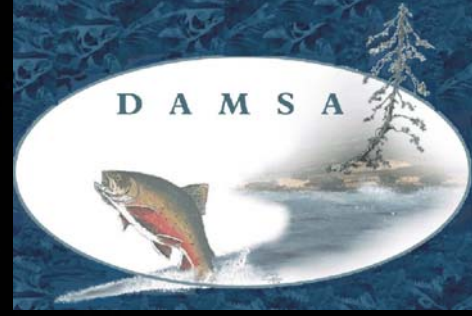
- This vulnerability to angling may have some resource management implications.
- In particular, highly valued fisheries that are very vulnerable to angling are also particularly vulnerable to unauthorized removal or poaching.
- Literature is replete with examples of poaching in brook trout sanctuaries.
- Including those in Southern Ontario (J. Fraser's studies)
- And those in our study lakes (Peridotite, Bateman, others)

Resource Management Implications …2



- In the restoration/improvement of fisheries, managing resources typically involve fishery population models with a quantitative approach to life history characteristics.
- Such models typically assume angler compliance in order to move the population in the desired direction.
- However unauthorized removal of fish can be the largest single unknown in management approaches. This may be particularly true for typical inland lake brook trout fisheries where there are low yields (say 0.5 - 5 kg/ha/yr) and high illegal exploitation.
- Our results suggest that attempts to create high quality trophy brook trout waters may be difficult where poaching is possible - without enhanced enforcement activity.

Acknowledgements:



- Ontario Ministry of Natural Resources managers, scientists and biologists
- Canadian Department of Fisheries and Oceans scientists at the West Vancouver Laboratory
- Ministry of Northern Development and Mines
- NRC- IRAP, Northern Ontario Heritage Fund
- Photos: Gord Ellis, Scott Smith, Paul Jordan
- And of course, the Brook Trout

Paul Jordan