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Tusket River

A summary of potential and problems

for

fish production

by

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INTRODUCTION

The Tusket River system is located in Yarmouth and Digby counties, Nova Scotia. The main Tusket River is approximately 58 miles in length, with a gentle gradient in many areas resulting in long deadwater areas and lakes. The two largest tributary streams are the Carleton River (43 miles in length) and the Silver River (25 miles in length). A survey of the Tusket River system was carried out by K.E. Smith in 1960 and 1962 and much of the following summary has been extracted from his report.

POTENTIAL FOR FISH PRODUCTION

Salmon spawning and rearing areas are provided by scattered riffle areas throughout the main river and in several tributaries. Figure 1 displays the approximate area and locations of available salmon rearing areas in the Tusket system. Smith (1962) reported the largest single spawning and nursery area to be located in the main river between the confluence with the Silver River and Big Meadow Brook. With normal flow conditions, this area will provide an estimated 345,000 square yards of nursery. Approximately 315,000 square yards of nursery are available in the main portion of the Silver River. An additional 640,000 square yards of potential nursery are scattered throughout the Tusket system, with the Carleton River contributing approximately 120,000 square yards of this total. Smith (1962) calculated an annual production of between 1,040 and 2,080 adult salmon. This was based on a conservative smolt production estimate of 1 to 2 per 100 square yards of nursery area and an adult survival rate of 8%.

The Tusket River is reported to have had a good sized salmon population prior to installation of the Tusket Falls Power generating station in 1929. Angling has usually been confined to the tidal area below the dam, with an average of about 20 salmon caught yearly over the period from 1960 - 1968. A brief electroseining survey carried out by Department personnel in 1971 failed to locate any salmon fry or parr at several sites on the Tusket system.

Development of an increased salmon run in the river could be valuable to both sports and commercial fishermen.

The 130 lakes and still-water areas of the river system also provide excellent spawning and nursery area for gaspereau. Potential spawning and nursery area are calculated to be in excess of 51 square miles, or about 33,000 acres. A significant portion of the commercial harvest of gaspereau in the Yarmouth area comes from the Tusket River system. Smith (1962) estimated production from the available area could be as high as 2 M. pounds annually.

Other species of fish observed in the Tusket system include speckled trout, anadromous eels, striped bass, yellow perch and white perch. The speckled trout is the only one of interest and provides a fairly good sports fishery in certain streams. The river would seem to have potential to produce significantly larger numbers of speckled trout and perhaps other trout species as well.

PROBLEMS FACING FISH PRODUCTION

1. Fish Passage

On the main Tusket River, the most serious obstacle to fish passage is the Tusket Falls Power Development. First constructed in 1929, this obstruction consists of two dams; a power-house dam on a by-pass channel and a regulating dam on the original channel. These dams both have fishways, however the fishway at the regulating dam is hampered by a lack of attraction water in the old channel, except during

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flood or high water conditions. The fishway at the power station by-pass has been the subject of numerous complaints. Gaspereau seem to successfully negotiate the fishway but few salmon find their way through. Downstream migration of juvenile and spawned fish has also been investigated as a problem at the power-house dam. Mortality tests conducted by Smith (1960) showed an estimated mortality of 20% for juvenile fish which passed through the turbines. Observations suggested that juvenile fish often occupy the surface region of the water, while adult fish remained deeper and were more likely to be transported through the turbines.

The only other obstacle on the main Tusket River is a small waterfall (about 4 feet high, 45^{o} angle) located 3 miles above the mouth of the Silver River. It may present a partial block for gaspereau but does not likely obstruct salmon.

On tributaries, serious obstructions are found on the Quinan River in the form of dams at Barren Lake and Quinan Lake (Figure 1). These dams have no fishways and while there is no potential salmon water above them, a large amount of gaspereau habitat is lost. Other serious barriers are to be found on the Carleton River. The lowermost barrier, Reynard's Dam at the mouth of Carleton Lake, was reconstructed in 1963-64 without a fishway, but with provision left for such. This dam effectively blocks the entire Carleton system for any anadromous fish species.

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Another barrier above this, Hicks Dam, on Ogden Lake also has no fishway. There are no other water control structures maintained on the Carleton River system except for a small, low-head dam at the mouth of Wentworth Lake (French Mills Dam) which has been recently abandoned. A small natural falls on the Caribou River (Silver River) also blocks a small region of potential salmon and gaspereau habitat.

2. Water Flows and Control

Tables I & II illustrate the mean monthly flows at two locations on the Tusket River system for the period 1929-1968. Table I considers nearly all the Tusket system except for the Carleton River tributary; while Table II gives the expected flows over the largest salmon rearing areas in the system (above the confluence of the Silver River).

Flows may be considerably less than the mean monthly minimum flows (August) for short periods and may cause some damage to fish habitat by drying of the stream bed. However, the flows seem to be adequate (perhaps stabilized to some degree by the large number of lakes in the system) and sufficient water is also available for spawning and escapement runs of fish. Smith (1962) suggested the possible construction of small control dams (i.e. above the main rearing area, Table II) which could maintain water flows at a more constant rate and eliminate flooding and drying of the streambed. This may be necessary in order to fully utilize the total potential rearing area for salmon

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in the upper portion of the Tusket system.

The intense system of lakes and deadwater areas in the lower Tusket may also suggest potential delay in spawning salmon reaching the better spawning and nursery areas above.

SUMMARY

The main problem in obtaining the potential production of salmon and gaspereau seems to be the lack of adequate fish passage facilities.

A suitable fishway at the Tusket Falls Power Station is necessary for re-establishment of the salmon run. Over 85% of the potential spawning and rearing areas for salmon would be made available by overcoming this obstacle. Fishways would be necessary at Reynard's and Hicks Dams on the Carleton River in order to utilize the remaining 15% of rearing area. With a potential production of only 100-200 adult salmon yearly, construction of these fishways are not likely justified.

However, the value of the Carleton River system for gaspereau may be significant. Presently, gaspereau utilize only about 1/2 of their potential spawning area. Reynard's and Hicks Dams eliminate 9,500 acres of habitat. Approximately 4,000 acres are eliminated by storage dams on the Quinan River and two natural obstructions (waterfalls) on the main Tusket River and the Caribou River block an estimated 3,700 acres. The value of such gaspereau habitat has been estimated at 2 dollars/per acre/ per year in the

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State of Maine.

It seems that first priority should be given to improving the fishway at the Tusket Falls Power Station. This could initiate an increase in salmon production, with an incidental increase in potential gaspereau production. The second priority could then be given to fishway construction at the two dams on the Carleton River with the primary aim of increasing gaspereau production and with possible incidental salmon production.

REFERENCES

Smith, K.E.H. 1960. Tusket River Power Dam, Yarmouth Co., N.S. Mortality Tests - Young Salmon & Gaspereau. Report. Fish Culture Branch, Halifax.

Smith, K.E.H. 1962. Tusket River Survey, Yarmouth Co. N.S. Dept. Fisheries, Halifax

TUSKET RIVER, N. S.

Table I - Longterm Mean Monthly Flows for Tusket River at Wilson's Bridge (lat. 43° 55' 24", long 65° 52' 12" N.S.).

- Drainage area equals 413 square miles.

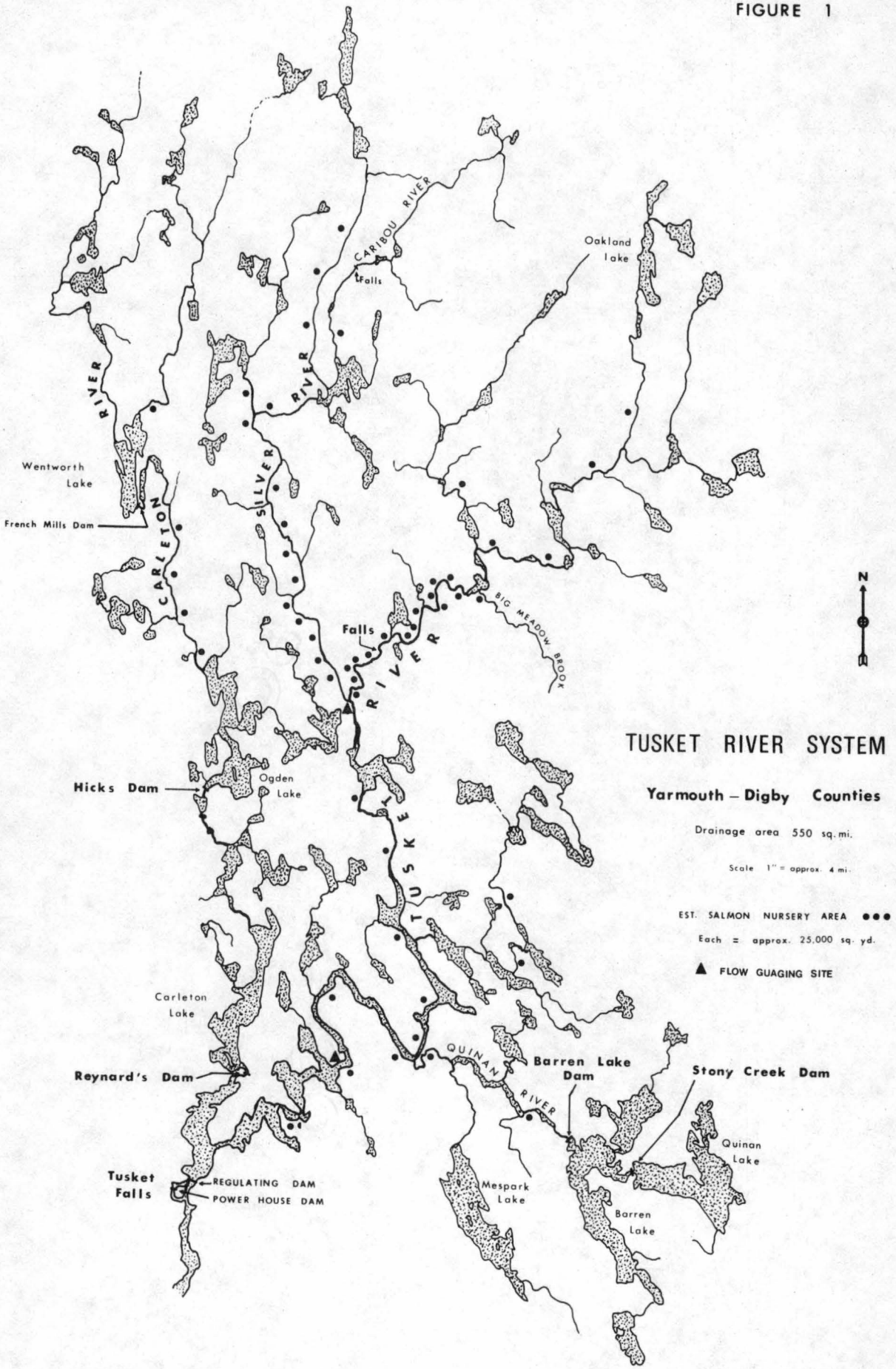
MONTH	LONGTERM MEAN (c.f.s.)
January	1630
February	1430
March	1650
April	1770
May	1010
June	754
July	560
August	450
September	580
October	729
November	1300
December	1545

Table II - Longterm Mean Monthly Flows for the Tusket River at the point where Silver River enters the mainstream (lat. 44° 6' 15", long. 66° 7' 40" N.S.).

- Drainage area equals 183 square miles

MONTH	LONGTERM MEAN (c.f.s.)
January	720
February	630
March	730
April	780
May	445
June	330
July	245
August	195
September	255
October	320
November	575
December	680

FIGURE 1


CARIBOU RIVER
Falls
Oakland Lake
SILVER RIVER
CARLETON RIVER
Wentworth Lake
French Mills Dam
BIG MEADOW BROOK
Falls
RIVER
TUSKET
Hicks Dam
Ogden Lake
Carleton Lake
Reynard's Dam
QUINAN RIVER
Barren Lake Dam
Stony Creek Dam
Quinan Lake
Tusket Falls
REGULATING DAM
POWER HOUSE DAM
Mespark Lake
Barren Lake
N
TUSKET RIVER SYSTEM
Yarmouth – Digby Counties
Drainage area 550 sq.mi.
Scale 1" = approx. 4 mi.
EST. SALMON NURSERY AREA
Each = approx. 25,000 sq. yd.
FLOW GUAGING SITE