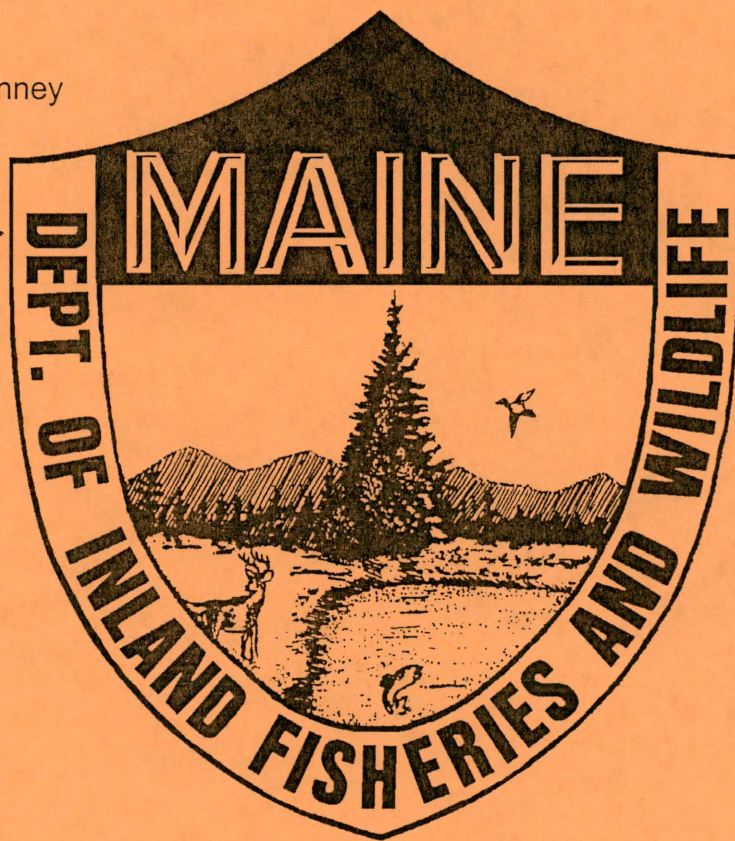


Comparative Performance of Two Genetic Groups of Stocked Brook Trout in Maine Lakes

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Maine Department of Inland Fisheries & Wildlife
Division of Fisheries & Hatcheries

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OF STOCKED BROOK TROUT IN MAINE LAKES

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SUMMARY

The performance of two new genetic groups of hatchery-reared brook trout was studied in eight Maine lakes from 1998 to 2000. These groups are being developed to replace the older domestic strains which, due to inbreeding, exhibited high mortality rates prior to hatch-out, and were short-lived in the wild. Paired stockings of Kennebago and Sourdnahunk fish, identified by different fin clips, were evaluated for catch rates, growth rates, and fall abundance. Anglers fished the study ponds at an average rate of 29 angler trips/ac/season, kept 0.14 fish/angler, and caught a legal-size brook trout for every 3.7 hours of fishing. The estimated harvest was equally comprised of Kennebago and Sourdnahunk fish. Older (age II+ and III+ fish) accounted for 31% of the Kennebago and 25% of the Sourdnahunk harvest. Because the older fish were heavier, Kennebago fish provided a harvest of 1.39 lb/a, compared to 0.83 for the Sourdnahunk fish. Population estimates, determined for only the three ponds with low interspecific competition, averaged 11 brook trout/ac, or 5.0 lb/ac. Older-age fish represented 17% of the number and 27% of the weight of the population. There was no difference in the incidence of hooking injuries between the Kennebago and Sourdnahunk fish. However, the Kennebago fish were more abundant, were larger than the Sourdnahunk fish and matured at an earlier age. There were differences in growth rates among ponds. Age II+ fish of both groups had a higher rate of hooking injuries than age I+ fish. Fish from a pond with an artificial-lures-only regulation also had significantly more hooking injuries than those from a pond with a fly-fishing-only regulation. Fish with hooking injuries were less robust than those without hooking injuries. For ponds with a similar number of competing fish species, older-age fish of the Kennebago and Sourdnahunk strains represented 33.5% of those captured, compared to only 4.3% for the domestic strains evaluated in an earlier study. To date, the new strains have higher hatching rates and better survival rates to older age than the domestic strains. This study is scheduled to be continued one more year.

ABSTRACT

Eight Maine lakes, located in Cumberland, Franklin, Kennebec, Oxford, and Washington counties, were studied in 1998-2000 to evaluate the performance of two new genetic groups of hatchery-reared brook trout (*Salvelinus fontinalis*). Paired stockings of Kennebago and Sourdnahunk trout, identifiable by differential fin excision, were evaluated for returns to the angler, growth rates, and post-angling-season abundance. Anglers fished the study ponds at an average rate of 29 angler trips/ac/season (72 angler trips/ha/season), kept 0.14 fish/angler, and caught a legal-size brook trout for every 3.7 hours of fishing. The estimated harvest was comprised of 50% Kennebago fish and 50% Sourdnahunk fish. Age II+ and age III+ fish accounted for 31% of the Kennebago and 25% of the Sourdnahunk harvest. Older-age Kennebago fish were harvested at a rate of 1.39 lb/ac (1.56 Kg/ha), compared to 0.83 lb/a (0.93 Kg/ha) for the Sourdnahunk fish. Population estimates, determined only for three ponds with low interspecific competition, averaged 11 brook trout/ac (27/ha), or 5.0 lb/ac (5.6 Kg/ha). Older-age fish represented 17% of the number and 27% of the weight of the standing stock. There was no significant difference in incidence of hooking injuries by genetic group. Kennebago fish were recaptured by trapnetting at higher rates, were larger (in both length and weight), and matured at an earlier age than Sourdnahunk fish. Age II+ fish of both groups had significantly more hooking injuries than age I+ fish. The incidence of hooking injuries was inversely correlated to regulatory severity. Fish with hooking injuries had significantly lower conditions than those without. Brook trout accounted for 48% of the fish biomass in a pond with low interspecific competition, but less than 1% of the biomass in ponds with severe interspecific competition. For ponds with comparable levels of interspecific competition, older-age (ages II+ through IV+) fish of the Kennebago and Sourdnahunk strains stocked at the same age represented 33.5% of those captured compared to only 4.3% for the domestic strains evaluated in an earlier study.

KEY WORDS: AGE & GROWTH, AGE FREQUENCY, ANGLER EFFORT, ANGLER SURVEY, BIOMASS, BKT, HARVEST, K-FACTOR, LAKE, MEAN SIZE, POPULATION ESTIMATE

INTRODUCTION

Of Maine's 1,135 principal¹ brook trout lakes, 476 are dependent on stocking to provide a fishery. Over the past century, the Department of Inland Fisheries and Wildlife's hatchery system has reared several strains of brook trout to meet the stocking needs of Maine's public waters. Most of these strains, including the so-called 'Maine Hatchery Strain', originated outside of the state. Despite periodic infusions of genes through the introduction of new strains, including the Assinica strain, domestic brook trout have exhibited poor longevity and high egg mortality. A 4-year study comparing performance of the Maine Hatchery and F1 hybrid (Maine Hatchery/Assinica) strains, which have accounted for the majority of the production stocking, indicated that holdover from age I+ to age II+ was only 6 and 8%, respectively (MDIF&W 1993). Furthermore, declining and erratic rates of egg survival (Appendix 1) have rendered these strains unreliable as sources of production fish. The inbreeding and domestication of these strains is attributed to crossings made with inadequate numbers of brood fish.

In an effort to reduce egg mortality and to increase the longevity of stocked brook trout, the Department's Hatchery Division undertook a program to replace domesticated stocks with two genetic groups of wild brook trout. Both groups were taken from river drainages with few or no records of having been stocked by the Department, and emphasis was placed on acquiring enough brook trout to assure that genetic variability was maintained. Brook trout eggs have been taken from Sourdnahunk Lake, located in Piscataquis County, since 1995; and from the Kennebec River, located in Franklin County, since 1996. Analysis of microsatellite DNA variation confirmed that these two populations represent distinct genetic units (Bernatchez 1996). The protocol for the establishment of these two new hatchery strains stipulates that a minimum of 100 female and 100 male brook trout be mated annually from each of these waters for a minimum of 3 years to establish a pool of brood fish; thereafter, an infusion of wild gametes will be made every 4 to 6 years in an effort to maintain heterozygosity.

In addition to establishing two populations of brood fish, progeny of these brook trout were also stocked experimentally in selected lakes to evaluate their relative performance. This report documents the first 4 years' performance of these two genetic groups of hatchery-reared brook trout.

STUDY AREA

The eight study lakes, like the majority of Maine's stocked trout lakes, are concentrated along the state's coastal lowlands and interior foothills. The physical characteristics of the study waters, which vary in size from 10 to 137 acres, approximate those of all stocked brook trout lakes less than 200 acres in size (Table 1). The number of competing fish species present in the study lakes varies from 1 to 9. A subjective index of interspecific competition was developed by assigning numeric values to other fish species based on their perceived degree of competition with brook trout (Appendix 2). Values were added and ranked proportionately on a scale of 0-10 to determine the water's degree interspecific competition. Competition severity was considered to be Low at McIntire, East and West Monroe, and Kimball ponds; Moderate at Jaybird Pond; High at Broken Bridge Pond, and Severe at Coffee and Egypt ponds (Table 2). Water quality at all of the study ponds is generally suitable for brook trout though seasonally marginal at several of the ponds (Table 3). Fishing regulations at all of the study ponds include a 2-fish bag limit. Five of the ponds have an 8-inch minimum length limit, and the other three have more restrictive length limits. The use of worms as bait is precluded at three of the ponds. Regulatory severity ranged from 3.5 (Moderate) to 7.5 (High). Regulations are considered to be of Moderate severity at five of the waters and High at the remaining three (Table 4).

METHODS

Paired stockings of Kennebago and Sourdnahunk brook trout were made at a combined rate of 30-74 fall fingerlings or 6-74 spring yearlings per surface acre (Table 5). The wide range in stocking rates is typical of that statewide, and results from differences in basic productivity, interspecific competition, and angling pressure. Coffee Pond was stocked with spring yearlings due to interspecific competition which has resulted in poor survival of fall fingerlings in the past; McIntire Pond was stocked with spring yearlings due to winter kill which periodically resulted in the mortality of fish stocked as fall fingerlings; and Egypt Pond was stocked with spring yearlings beginning in 2000 due to poor returns from the stockings of fall fingerlings. The two

¹A principal fishery is one for which the species is regularly sought by anglers and which makes up a significant portion of the catch.

genetic groups were differentially marked for identification by fin excision and a representative size sample of each group was taken periodically prior to stocking (Table 6). The 1995 year class was reared at three stations. Subsequent year classes were reared at the Embden Rearing Station until 1999 when both genetic groups to be stocked at West Monroe Pond were raised at the Cobb Hatchery in Enfield.

Comparative catch and harvest rates were determined by season-long stratified random clerk creel surveys conducted at Egypt, Kimball, and McIntire ponds in 1998 - 2000 (Table 7). Post-fishing season population estimates by genetic group were determined by trapnetting using the Schnabel method. Efforts to determine population estimates were unsuccessful in 1997; this failure was attributed to the immaturity of the age I+ brook trout at large. Population estimates were successfully completed at several of the ponds in 1998 -2000. An average of 2.3 nets were set per pond and average dates ranged from Oct. 8 to Oct. 27, or 21 days (Table 8). The generic term 'trapnet' is used throughout this report to describe the nets used for fall live brook trout capture. In fact, both Maine fykenets and fine-meshed Oneida Lake trapnets were used.

Trapnetting capture rates were compared to those for domestic strains (Maine Department Inland Fisheries & Wildlife 1993) captured at East Monroe, West Monroe, and Pineo Ponds, Hancock Co., 1988-92. These data provide the most recent and comparable source of information about the Maine Hatchery Strain and the F₁ Strain, which comprised the majority of brook trout stocked prior to the advent of the Kennebago and Sourdahunk fish.

Several project biologists informally reported better capture success with trapnets than with fykenets, which have traditionally used in Maine to capture brook trout for population estimates. Though both net types have similar form and function, Maine fykenets employ rigid metal hoops in their construction whereas Oneida Lake trapnets do not. To test relative capture rates, both net types were used at McIntire Pond from October 23 to November 1 in the fall of 2000. The fykenet was moved once in an effort to improve the catch rate.

Differences in fish sizes were tested using ANOVA, *t* Test, and Duncans multiple range test. Chi square analysis was used to compare age structures. Significance level was set at P=0.05 for all tests.

RESULTS

Angler use and brook trout harvest

Anglers fished the study ponds at rates ranging from 22 angler trips/ac/season at McIntire Pond to 32 for Kimball Pond and Egypt for the 3-year period (Tables 9-11); the average rate of use was 29 angler trips/ac/season (Table 12). A similar survey conducted at McIntire Pond in 1992 indicated a comparable use rate of 37 angler trips/ac/season. Numerically, the creel surveys indicated that equal numbers (778 Sourdnhunk and 776 Kennebago) by genetic group were harvested from the 3 ponds during the 3-year period. However, there was a difference in the proportion of older fish caught; 245 (31 %) of the Kennebago fish sampled were age II+ or age III+ compared to 195 (25%) of the Sourdnhunk fish. Size information was collected during summer clerk surveys from the three study ponds and by gillnetting from East Monroe Pond from 1998-2000. Of the fish sampled by clerk survey, 66 (80%) were from Egypt Pond, which had the most liberal harvest restrictions. For fish sampled during the summer from all waters, Kennebago fish weighed 44% more at age I+, but weights were the same for age II+ and age III+ fish. Due to the higher proportion of older-age fish in the catch, Kennebago fish were harvested at a rate of 1.13 lb/ac, compared to 0.71 for Sourdnhunk fish.

The age at recruitment was determined by length restrictions. At Egypt Pond, which had an 8-inch minimum length limit, age I+ fish of both groups were vulnerable to harvest. At Kimball and McIntire Ponds, which have 12-inch minimum length limits, neither group was vulnerable to harvest until age II+.

Time, frequency, and relative size of brook trout captured by fall netting

Trapnetting capture efficacy increased markedly during the third week of October when water temperatures approached 50°F (10°C) and remained high through the second week of November when water temperatures neared the freezing mark. Age I+ and age II+ Kennebago fish sampled in the fall were significantly longer and heavier than Sourdnhunk fish (Tables 14 and 16). Significantly more Kennebago than Sourdnhunk were captured by trapnetting. Sixteen age II+ wild brook trout captured at McIntire Pond in the fall of 2000 are likely progeny of Anninica/Maine Hatchery Strain (Table 15). Brook trout captured at McIntire Pond, which has low interspecific competition, tended to be significantly larger than those from Kimball Pond

or West Monroe Pond (Table 17). The average sizes of age I+ fish from both groups were significantly smaller than those for domestic strains (Table 18).

A trapnet set at McIntire Pond captured a total of 102 brook trout; a fykenet set the same period captured 25 brook trout, supporting anecdotal contentions of superior catches of brook trout by trapnets. The trapnet and fykenet captured 25 and 65 creek chub, respectively, during the same period.

Brook trout population estimates and biomass by genetic group

Post-fishing-season brook trout population estimates were determined for Kimball and McIntire ponds in 1998-2000, for West Monroe Pond in 1998, and for Egypt Pond in 2000. Interspecific competition was low at all waters except Egypt Pond. Attempts to determine brook trout populations at ponds with higher degrees of competition, including Egypt, were unsuccessful with plantings of fall fingerlings. The successful population estimate at Egypt Pond followed a stocking of spring yearlings.

There was little difference in the estimates by genetic group except that age IV+ Kennebago fish were captured and age IV+ Sourdnahunk fish were not. For all waters and years, standing stock averaged 10.6 brook trout (5.0 lb) per acre (Table 19). The average abundance of age I+ fish was 7.8 (3.2 lb) per acre; age II+ fish was 2.6 (1.6 lb) per acre; age III+ fish was 0.3 (0.3 lb) per acre; and age IV+ fish was 0.1 (0.2 lb) per acre. Age II+ fish represented 24% of the number and 32% of the weight of the standing stock; age III+ fish represented 3% of the number and 6% of the weight of the standing stock.

For all waters, a significantly higher proportion of Kennebago fish was captured by trapnetting. For individual waters, significantly more Kennebagos were captured except that more Sourdnahunk fish were captured at McIntire Pond, where they were stocked as spring yearlings (Table 20). Additional sampling is necessary to determine whether capture rates by genetic group are correlated to age at stocking.

Both age I+ and age II+ Kennebago fish were significantly heavier than Sourdnahunk fish of comparable ages (Table 16). Of the age I+ fish sampled during the fall, significantly more Kennebago (84%) than Sourdnahunk (59%) were mature (Table 21). All age II+ fish were mature. For both genetic groups, an average of 72% of age I+ fish was mature; this figure is similar to that for the domestic strain, which was 74% mature.

There were no significant differences between the genetic groups in the percent of hooking injuries observed for age I+ fish, for age II+ fish, or for all ages combined (Tables 22 and 23). However, age II+ fish (groups combined) had significantly more hooking injuries (34%) than age I+ fish (18%). For age both age I+ and age II+ fish from all study lakes, the condition of brook trout with hooking injuries was significantly lower than those without. Age I+ brook trout from Kimball Pond, which has an artificial-lures-only regulation, had significantly more hooking injuries (23%) than those from McIntire Pond (4%) , which had a fly-fishing-only regulation.

Post-stocking growth rates were obtained for both Kennebago and Sourdnahunk fish from four waters (Table 24). Growth summaries indicated that, for fish of both groups stocked as fall fingerlings, the greatest increase in lengths occurred the first year at large, when the Kennebago fish grew an average of 4.3 in and the Sourdnahunk fish grew an average of 3.9 in.; growth in subsequent years declined to 2 to 3 inches per year for both groups. However, weights increased at greater rates as fish matured. Fish stocked as spring yearlings in 2000 grew at a faster rate during their first 6 months at large at McIntire Pond (an average increase of 0.4 in and 0.8 oz for the two genetic groups) than at Egypt Pond (an average increase of 0.2 in and 0.2 oz). Weight gain of Kennebago fish exceeded that of Sourdnahunk fish (Table 25).

Netting capture rates for fish stocked as fall fingerlings declined rapidly as interspecific competition increased, and were negligible for both groups and all ages at waters with moderate to severe interspecific competition, regardless of regulatory protection (Table 26). Fish stocked as spring yearlings were captured at much higher rates (20.3% of the age I+ fish stocked were captured at McIntire vs. 4.6% at Kimball; interspecific competition is low at both ponds), but also declined in the presence of interspecific competition (0.7% at Egypt Pond). Kimball Pond has a rate of interspecific competition comparable to the Pike Brook Ponds and Pineo Pond, where capture rates of the older, domestic strains of brook trout were conducted from 1988-90. Although capture rates of age I+ fish were higher for the domestic strains (6.4 vs. 4.6%), only 0.3% of the age II+ domestic strain fish were captured, compared an average of 2.6 % for the age II+ Kennebago and Sourdnahunk fish, some of which were also captured at ages III+ (1.2%) and IV+ (0.2%).

Brook trout biomass accounted for 48% of the total fish weight at McIntire Pond, which has low interspecific competition, but declined rapidly as interspecific competition increased;

brook trout biomass was reduced to 1% or less of the total in waters with even moderate competition (Table 27). Bullhead accounted for the greatest amount of biomass, followed by suckers and minnows. The degree of competition that other species impose is demonstrated by population estimates conducted at Broken Bridge and Jaybird ponds (Table 28). Estimates of bullhead abundance indicated a population of 237 and 954 fish per acre, respectively. At McIntire Pond, creek chub abundance varied considerably but averaged 36 fish (8.0 lb) per acre, compared to 12.3 brook trout (5.4 lb) per acre.

DISCUSSION

The average angler use rate of 29 angler trips/ac/season at the study lakes exceeds that for wild brook trout ponds, which averaged 6 anglers trips/ac/season (MDIF&W 1999). The higher rate of use is attributed to the fact that the stocked ponds surveyed are located in central and southern Maine, closer to human population centers. Egypt Pond, which has liberal regulations, is managed with an emphasis on harvest. Despite differing regulations, Egypt and Kimball ponds shared the same average rate of angler use, which again may be a function of access. Kimball and McIntire ponds, with more restrictive length and gear restrictions, are managed as quality fisheries. Anglers at Egypt Pond voluntarily released fewer legal-size fish than those at the other ponds. For the 3-year survey period, creel survey data indicated that Kennebago fish outperformed Sourdnahunk fish in several areas: Kennebago fish were caught at a more consistent rate from pond to pond; a higher proportion was caught as older (age II+ and age III+) fish; and the Kennebago fish were larger at comparable ages.

Fall sampling results indicated that trapnetting propensity increases markedly as water temperatures approach 50°F. For the sake of efficiency, it is suggested that sampling be deferred until waters approach this temperature.

Post-fishing-season samples from Kimball, McIntire, and West Monroe ponds confirmed the creel survey results indicating that, despite the differences in growth rates that occur among ponds, Kennebago fish were significantly larger overall than the Sourdnahunk fish. Estimates for the number of fish per acre were similar for the two groups, indicating similar survival rates. Survival to age II+ and age III+ for both groups was significantly higher than that for the domestic strains, thus fulfilling one of the primary goals of establishing hatchery-reared strains of

brook trout with the potential for greater longevity. As expected, the average size of the age I+ Kennebago and Sourdnahunk fish was less than that of the domestic strain, but an overall size advantage for these groups is expected to accrue with greater longevity. The proportion of age I+ fish that were mature (50% of the Kennebago and 55% of the Sourdnahunk) is intermediate between the 41% for 992 age I+ wild brook trout sampled statewide (MDIF&W 1999) and the 60% for the domestic strain.

Fish with observable hooking injuries had poorer condition than those without. There were also higher rates of injuries on older fish, and lower rates of injuries on the pond with a fly-fishing-only regulation than on the pond with an artificial-lures-only regulation. Because these differences have implications for the establishment of quality fisheries, additional data will be gathered at these and at the other study ponds with differing regulations for the final year of the project.

The Kennebago and Sourdnahunk fish were smaller at stocking than were those of the domestic strains. Managers' concerns that their smaller size would result in poorer survival and performance in waters with interspecific competition were confirmed by poor returns from Broken Bridge, Jaybird, East Monroe, Coffee, and Egypt ponds. Although no data exist on the performance of the domestic strains in waters with substantial interspecific competition, managers believe that, due to their larger size at stocking, they survived at higher rates during the first year than the new strains and therefore provided better returns to anglers. Hatchery managers have been moderately successful in increasing the size of the new strains prior to stocking as they become more familiar with their behavioral and nutritional needs. From 1996 to 1999, the average size of the Kennebago and Sourdnahunk fish increased 0.4 inches in length and 0.2 oz in weight.

Hatchery managers at the Phillips and Embden stations also provided information contrasting the behavior of the Kennebago and Sourdnahunk fish to that of the domestic strains. The domestic strains typically became infested with external parasites in late June, and demonstrated a 'flashing' behavior to rid themselves of these irritants. These infestations were treated with formalin. The new strains have not exhibited the flashing behavior to date, suggesting that they may be less susceptible to external parasites. The new strains have greater scatter reflexes than the old strains, and disseminate faster post-planting. Due to their wildness and greater range of sizes, the rearing of the new strains have presented challenges to hatchery

personnel. They have responded by reducing the amount of light, employing automatic feeders, using a wider array of food sizes to accommodate the range of fish sizes, and by manipulating raceway densities.

This study was initiated to evaluate the relative performance of two new hatchery-reared genetic groups of brook trout in the wild. To date, survival and harvest rates of the two groups indicate that the Kennebago fish have shown superior rates of growth and survival to older ages.

The original study plan has been modified to extend the season-long creel surveys from 2 to 3 years (now completed); to abandon monitoring of those waters where brook trout survival was poor; and to conduct the fall population estimates on the remaining waters through the year 2001 to more thoroughly evaluate the longevity of the two genetic groups. These additional data will assist in meeting the stated goal of comparing the performance of these two groups of brook trout in the wild by providing information on the contribution of several year classes of fish, and their performance under differing rates of interspecific competition and regulatory severity.

RECOMMENDATIONS

1. Conduct post-fishing-season population estimates of brook trout at McIntire and Kimball ponds only in the fall of 2001. Defer netting until surface water temperatures approach 10°C (50°F). Estimate the relative abundance of competing fish species. Record the incidence of hooking injuries.
2. Prepare a final report during the winter of 2001-2002.

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Table 1. Location and physical characteristics of stocked brook trout lakes and of 256 statewide brook trout lakes <200 acres stocked with fall fingerlings and sampled 1993-95.

Water	County	River drainage:		Surface area (acres)	Depth		Elevation (ft)	Maximum secchi reading (ft)
		Major	Minor		Mean (ft)	Max. (ft)		
Broken Bridge P	Oxford	Presumpscot	Songo-Crooked	20	12	25	794	14.0
Coffee P	Cumberland	Presumpscot	Presumpscot	137	32	70	466	35.0
Egypt P	Franklin	Kennebec	Lower Sandy	60	19	50	487	5.5
Jaybird P	Oxford	Saco	Ossipee	14	9	21	415	.
Kimball P	Kennebec	Androscoggin	Dead	55	10	19	904	5.0
McIntire P	Franklin	Kennebec	Messalonskee	20	7	20	956	9.0
Monroe P (East)	Washington	Saint Croix	St. Croix	10	12	26	270	.
Monroe P (West)	Washington	Saint Croix	St. Croix	13	11	36	270	.
Mean				41	15	35	515	14.9
Statewide mean of 256 brook trout lakes				43	11	26	934	7.4 (50)

Table 2. Competing fish species present in stocked brook trout study lakes.

Water	Competing species ²														All	0-10 scale	Cate- gory			
	EEL	WHS	LMB	PKL	CMS	NRD	FHM	BUL	CCB	BKF	SLT	SKB	PKS	GLS						
Monroe P (West)												1		5	6	1.2	Low			
McIntire P												7				7	1.4	Low		
Kimball P													3		5	8	1.6	Low		
Monroe P (East)						3								1	5	9	1.8	Low		
Jaybird P ³												9			5	14	2.9	Mod		
Broken Bridge P	6			10								7		6	6	35	7.1	High		
Coffee P			9	10								7		6	1	6	39	8.0	Sev	
Egypt P	6	9					2	3	9				3	6		6	5	49	10.0	Sev
All	2	1	1	2	1	1	1	2	3	2	3	3	3	3	5	167				

²BKF = banded killifish; BUL = brown bullhead; CCB = creek chub; CMS = common shiner; EEL = American eel; FHM = fathead minnow; FSD = finescale dace; GLS = golden shiner; LCB = lake chub; LMB = largemouth bass; NRD = northern redbelly dace; PKL = chain pickerel; PKS = pumpkinseed sunfish; SKB = stickleback species; SLT = rainbow smelt; WHS = white sucker

³PKS and WHS were documented as new species 1998; however, due to their low abundance, they are not included as competitors.

Table 3. Summer water quality values of wild brook trout study lakes and statewide means of all Maine wild brook trout lakes less than 200 acres.

Water	Date	Depth (ft)	Temp. (°F)	pH	Oxygen (ppm)	Total Alkalinity	Conduc- tivity
Broken Bridge P	08/08/91	0	77	6.0	11.0	3	29.5 ⁴
		5	74				
		10	65				
		15	52				
		25	45				
Coffee P	07/28/94	0	73	6.2	7.8		43.5 ⁵
		10	64				
		16	57				
		20	55				
Egypt P	07/25/95	0	78	6.8	9.0	7	
		7	72				
Jaybird P	08/02/95	0	80	6.6	7.8	4	
		6	79				
		10	73				
		12	70				
		14	64				
		20	53				
Kimball P	07/26/94	0	77	6.4	8.0	2	20.0
		8	73				
McIntire P	08/17/99	0	73	6.1	7.3	3	21.0
		5	70				
		10	68				
		15	55				
		19	48				
Monroe P (East)	07/25/95	0	75	6.6	9.0	6	
		9	61				
		10	57.5				
		15	50				
		16	48				
Monroe P (West)	07/25/95	0	78	6.4	9.0		
		10	58				
		13	51				
		15	47				
		30	40				
Statewide average (sample size in parentheses)	1993-95	0-10	65	6.8	8.1	16.7	69
			(2136)	(1077)	(1392)	(584)	(192)
		11-20	58	6.4	6.7	14.6	67
		(1099)	(426)	(710)	(150)	(48)	
		>20	49	6.4	4.6	30.9	67
			(1687)	(719)	(1242)	(248)	(73)

⁴Mean of 11 readings taken at various depths from 1974-79.

⁵Mean of 5 readings taken at various depths in 1979.

Table 4. Brook trout regulations in effect at brook trout study lakes, 1996-2000.

Water	Minimum length limit (in)	Creel limit	Gear restriction	Regulatory severity	Regulatory category
Coffee P	8	2	NLFAB ⁶	3.5	Moderate
Egypt P	8	2	NLFAB	3.5	Moderate
Monroe P (East)	8	2	NLFAB	3.5	Moderate
Monroe P (West)	8	2	NLFAB	3.5	Moderate
Jaybird P	8	2	ALO ⁷	4	Moderate
Broken Bridge P	10; 1>12	2	NLFAB	5	High
Kimball P	12; 1>14	2	ALO	6.5	High
McIntire P	12; 1>14	2	FFO ⁸	7.5	High

⁶No live fish as bait

⁷Artificial lures only

⁸Fly fishing only

Table 5. Stocking history of brook trout study ponds, 1996-2000.

Water	Brood year	Year stocked	Age at stocking	Genetic group	No/		Mark	Size at stocking		Total weight stocked	Lbs/acre stocked	Rearing facility
					Number	acre		Ln (in)	No/lb			
Broken Bridge P	1995	1996	FF	Kennebago	400	20	RV	4-6	23.5	17	0.85	Palermo
				Sourdnahunk	400	20	LV	4-6	28.6	14	0.70	Enfield
	1996	1997	FF	Kennebago	400	20	RV-Ad	4-6	16.0	25	1.25	Embden
				Sourdnahunk	400	20	LV-Ad	6-8	9.3	43	2.15	Embden
	1997	1998	FF	Kennebago	400	20	RP	6-8	10.8	37	1.85	Embden
				Sourdnahunk	400	20	LP	6-8	8.5	47	2.35	Embden
Coffee P	1995	1997	SY	Kennebago	400	3	RV-Ad	6-8	7.8	51	0.37	Embden
				Sourdnahunk	400	3	LV-Ad	6-8	8.7	46	0.34	Casco
	1996	1998	SY	Kennebago	400	3	RP	6-8	6.5	62	0.45	Embden
				Sourdnahunk	400	3	LP	8-10	4.9	81	0.59	Embden
Egypt P	1995	1996	FF	Kennebago	2,200	37	RV	4-6	25.0	88	1.47	Palermo
				Sourdnahunk	2,200	37	LV	4-6	31.4	70	1.17	Enfield
	1996	1997	FF	Kennebago	2,200	37	RV-Ad	4-6	15.2	145	2.42	Embden
				Sourdnahunk	2,200	37	LV-Ad	6-8	9.4	234	3.90	Embden
	1997	1998	FF	Kennebago	1,800	30	RP	6-8	9.8	183	3.05	Embden
				Sourdnahunk	1,800	30	LP	6-8	9.5	190	3.17	Embden
1998	2000	SY	Kennebago	2,200	37	RP-Ad	8-10	4.6	476	7.93	Embden	
			Sourdnahunk	2,200	37	LP-Ad	6-8	6.2	357	5.95	Embden	
Jaybird P	1995	1996	FF	Kennebago	350	25	RV	4-6	23.3	15	1.07	Palermo
				Sourdnahunk	350	25	LV	4-6	29.2	12	0.86	Enfield
	1996	1997	FF	Kennebago	350	25	RV-Ad	4-6	16.7	21	1.50	Embden
				Sourdnahunk	350	25	LV-Ad	6-8	9.2	38	2.71	Embden
1997	1998	FF	Kennebago	350	25	RP	6-8	10.9	32	2.29	Embden	
			Sourdnahunk	350	25	LP	6-8	9.7	36	2.57	Embden	

Table 5. Stocking history of brook trout study ponds, 1996-2000 (con't).

Water	Brood year	Year stocked	Age at stocking	Genetic group	Number	No/acre	Mark	Size at stocking		Total weight stocked	Lbs/acre stocked	Rearing facility	
								Ln (in)	No/lb				
Kimball P	1995	1996	FF	Kennebago	1,400	25	RV	4-6	25.0	56	1.02	Palermo	
				Sourdnahunk	1,400	25	LV	4-6	31.1	45	0.82	Enfield	
	1996	1997	FF	Kennebago	1,400	25	RV-Ad	4-6	12.4	113	2.05	Embden	
				Sourdnahunk	1,400	25	LV-Ad	6-8	9.2	152	2.76	Embden	
	1997	1998	FF	Kennebago	1,400	25	RP	6-8	9.7	145	2.64	Embden	
				Sourdnahunk	1,400	25	LP	6-8	9.4	149	2.71	Embden	
	1998	1999	FF	Kennebago	1,400	25	RV	6-8	8.2	170	3.09	Embden	
				Sourdnahunk	1,400	25	LV	6-8	10.1	139	2.53	Embden	
	McIntire P	1996	1998	SY	Kennebago	200	10	RP	6-8	7.1	27.7	1.38	Embden
					Sourdnahunk	200	10	LP	8-10	5.1	39.3	1.96	Embden
		1997	1999	SY	Kennebago	200	10	RV	6-8	6.9	29.0	1.45	Embden
					Sourdnahunk	200	10	LV	6-8	6.3	31.7	1.59	Embden
1998		2000	SY	Kennebago	200	10	RP-Ad	6-8	5.6	35.7	1.78	Embden	
				Sourdnahunk	200	10	LP-Ad	6-8	6.1	32.8	1.64	Embden	
Monroe P (East)	1995	1996	FF	Kennebago	150	15	RV	4-6	25.0	6.0	0.60	Palermo	
				Sourdnahunk	150	15	LV	4-6	30.0	5.0	0.50	Enfield	
	1997	1998	FF	Kennebago	250	25	RP	6-8	11.1	22.5	2.25	Embden	
				Sourdnahunk	250	25	LP	6-8	10.4	24.0	2.40	Embden	
Monroe P (West)	1996	1997	FF	Kennebago	250	19	RV-Ad	6-8	13.3	18.7	1.44	Embden	
				Sourdnahunk	250	19	LV-Ad	4-6	8.0	31.3	2.40	Embden	
	1998	1999	FF	Kennebago	250	19	RV	4-6	16.7	15.0	1.15	Enfield	
				Sourdnahunk	250	19	LV	4-6	15.6	16.0	1.23	Enfield	

Table 6. Mean lengths (mm) and weights (g) of brook trout reared at three Maine facilities, by age in months.

Genetic group	Rearing station	Brood year	Size variable	Age in months															
				5	6	7	8	9	10	11	12	13	14	15	16	17	18		
Kennebago Weight	Embden	1995	Length	63±1 (120)	81±1 (150)	102±1 (120)	128±2 (120)	147±2 (120)	160±2 (60)	164±4 (30)	168±3 (60)	173±3 (30)	.	182±2 (90)	179±2 (60)				
			Weight	53±2 (60)			
		1996	Length	71±1 (60)	88±1 (150)	111±1 (120)	131±1 (120)	149±2 (60)	.	160±4 (30)	177±2 (60)	184±3 (30)	191±3 (30)		
			Weight	.	.	13 (120)	22 (120)	31 (60)	.	38 (30)
		1997	Length	.	68±1 (120)	84±1 (120)	109±1 (120)	127±2 (60)	157±2 (120)	187 (90)	193 (60)
			Weight	.	3 (120)	6 (120)	13 (120)	21 (60)	37 (120)	45 (30)	46 (30)	48 (30)	47 (30)	52 (30)	59 (30)	65 (90)	70 (60)		
	1998	Length																	
		Weight																	
	Sourd-nahunk	Embden	1995	Length									
				Weight	5 (30)	10 (30)	15 (30)	27 (30)	29 (30)	31 (30)									
		1996	Length	59±1 (120)	79±1 (150)	102±1 (120)	130±2 (120)	142±2 (120)	160±3 (60)	165±3 (30)	167±3 (60)	160±4 (30)	.	170±2 (90)	175±4 (30)				
			Weight	51±4 (30)				
1997		Length	78±1 (60)	100±1 (150)	130±1 (120)	160±2 (120)	174±3 (60)	.	176±4 (30)	.	.	.	196±4 (60)	197±5 (30)	208±3 (60)				
		Weight	.	.	24±1 (60)	46±2 (60)	54±3 (30)	.	52±4 (30)		
1998	Length	66±1 (150)	89±1 (120)	117±1 (210)	143±1 (120)	163±2 (120)								195 (90)	203 (60)				
	Weight	3 (150)	7 (120)	18 (210)	30 (120)	45 (120)	52 (30)	54 (30)	59 (30)	63 (30)	64 (60)	75 (90)	82 (60)						
1998	Length																		
	Weight																		

Table 6. Mean lengths (mm) and weights (g) of brook trout reared at three Maine facilities, by age in months (con't).

Genetic group	Rearing station	Brood year	Size variable	Age in months													
				5	6	7	8	9	10	11	12	13	14	15	16	17	18
Sourd-nahunk (con't)	Enfield	1995	Length	.	85	.	119	133	136								
			Weight	2	6	.	14	18	21								
				(30)	(30)		(30)	(30)	(30)								

Table 7. Work summary for brook trout study lakes, 1997-2000

Water	Year	Summer fishing season		Post-fishing season				Age and growth rates of trout netted
		Brook trout catch and harvest rates	Ages and growth rates of trout harvested	Population estimate		Standing stock		
				Brook trout	Competing species	Brook trout	Competing species	
Broken Bridge P	1999							X
Jaybird P	1997				X		X	X
Egypt P	1998	X	X			X	X	X
	1999	X	X			X	X	X
		X	X			X		X
Kimball P	1998	X	X			X	X	X
	1999	X	X			X		X
	2000	X	X			X		X
McIntire P	1998	X	X			X	X	X
	1999	X	X		X	X	X	X
	2000	X	X		X	X	X	X
Monroe P (West)	1998				X		X	
	2000							X
Monroe P (East)	1999							X
	2000							X

Table 8. Post-season trapnetting schedules and associated water temperatures (°F) for brook trout study ponds, 1997-2000.

Water	Year	No. nets	Date set	Water temp.	Date pulled	Water temp	No. days	Net	
								days ⁹	hours ¹⁰
Broken Bridge P	1997	2	Sep 27	56	Oct 22	50	25	50	1,200
	1998	2	Oct 5	57	Oct 26	54	21	42	1,008
	1999	2	Oct 20	.	Nov 3	.	14	28	672
Coffee P	1997	2	Sep 29	60	Oct 17	59	18	36	864
	1998	2	Oct 2	63	Oct 20	59	18	36	864
Jaybird P	1997	3	Sep 27	59	Oct 27	45	30	87	2,088
	1998	2	Oct 7	57	Oct 28	52	21	42	1,008
	1999	2	Oct 20	.	Nov 3	.	14	28	672
Egypt P	1997	3	Oct 8	57	Oct 31	48	23	69	1,656
	1998	3	Oct 14	54	Oct 28	52	14	42	1,008
	1999	3	Oct 27	47	Nov 18	41	22	66	1,584
	2000	3	Oct 16	54	Nov 6	46	21	63	1,512
Kimball P	1997	3	Oct 8	57	Oct 31	46	23	69	1,656
	1998	3	Oct 14	54	Nov 13	39	30	82 ¹¹	1,968
	1999	3	Oct 20	50	Nov 15	41	26	78	1,872
	2000	3	Oct 16	52	Nov 6	46	21	63	1,512
McIntire P	1998	2	Oct 28	46	Nov 13	36	16	32	768
	1999	2	Oct 15	50	Nov 10	40	27	54	1,296
	2000	2	Oct 20	46	Nov 8	41	19	38	912
Monroe P, East	1997	2	Oct 6	.	Oct 23	.	17	34	816
	1999	1	Oct 15	.	Nov 4	.	19	19	456
Monroe P, West	1998	1	Oct 21	.	Nov 9	.	19	19	456
	2000	1	Oct 25	52	Nov 8	.	14	14	336
Mean		2.3	Oct 8	54	Oct 27	47	21	47	1,138
Range		1-3	Sep 27- Oct 28	46-63	Oct 17- Nov 18	36-59	14-30	14-87	336-2,088

⁹Calendar days netted X no. of nets used

¹⁰Hours netted X no. of nets used

¹¹The third net was set Oct 23

Table 9. Clerk creel survey summaries for Egypt Pond.

	Brook trout		Year			
	Genetic group	Age	1998	1999	2000	All
No. anglers surveyed			217	142	198	557
No. angler hours surveyed			397	268	417	1,082
No. (%) anglers successful in catching a legal BKT	All	All	35 (16)	25 (18)	81 (41)	141 (25)
No. legal BKT kept	Kenn	I+	6	5	36	47
		II+	4	2	4	10
		III+	N/A	2	0	2
		All	10	9	40	59
	Sourd	I+	15	5	28	48
		II+	2	2	3	7
		III+	N/A	1	2	3
		All	2	3	33	38
	Both	All	26	18	73	117
	Other	All	4	2	0	6
	All	All	30	20	73	123
No. (%) legal BKT released	All	All	27 (47)	44 (69)	212 (74)	283 (70)
No. legal BKT caught per angler (kept + released)	All	All	0.26	0.45	1.60	0.73
No. (%) sublegal BKT	All		240 (90)	97 (60)	124 (30)	461 (53)
No. legal BKT per angler (only those kept)	Kenn	I+	0.03	0.04	0.18	0.08
		II+	0.01	0.01	0.02	0.02
		III+	N/A	0.01	0	0.01
		All	0.04	0.06	0.20	0.11
	Sourd	I+	0.07	0.04	0.14	0.09
		II+	0.01	0.01	0.02	0.01
		III+	N/A	0.01	0.01	0.01
		All	0.08	0.06	0.17	0.07
	Both	All	0.12	0.13	0.37	0.21
	Other	All	0.02	0.01	0	0.01
	All	All	0.14	0.14	0.37	0.22
Hours to catch A legal BKT (all legal fish caught)	All	All	6.8	4.2	1.5	2.7
Estimated Total annual BKT harvest ± CI (@95%)	Kenn	I+	70±25	45±14	417±145	532
		II+	23±8	11±3	46±16	80
		III+	N/A	11±3	0	11
		All	93±33	67±3	463±161	623
	Sourd	I+	163±58	45±14	324±113	532
		II+	23±8	11±3	26±16	60
		III+	N/A	11±3	13±8	24
		All	186±66	67±21	394±137	616
	Both	All	279±99	145±45	856±298	1,239
	Other	All	47±17	11±3	0	58
	All	All	326±116	156±49	856±298	1,338

Table 9. Clerk creel survey summaries for Egypt Pond (con't).

		Brook trout		Year				
		Genetic		1998	1999	2000	All	
		group	Age					
Estimated total angler trips ±CI (@ 95%)				2,326±827	1,117±347	2,314±806	5,757	
Estimated total angler trips per acre				39±14	19±6	39±13	32	
Estimated weight (Lb) of BKT harvested	Kenn	I+		13.57	11.61	106.55	131.73	
		II+		11.91	7.75	15.10	34.76	
		III+		N/A	15.87	0	15.87	
		All		25.48	35.21	121.65	182.34	
	Sourd	I+		25.85	6.57	63.52	95.94	
		II+		8.11	4.24	8.13	20.48	
		III+		N/A	9.45	13.46	22.91	
		All		33.96	20.26	85.11	139.33	
	Both	All		58.38	55.49	206.76	320.63	
		Other	All	15.22	10.36	0	25.58	
	All	All		72.75	65.85	206.76	345.36	
	Estimated weight (Lb/a) of BKT harvested	Kenn	I+		0.23	0.19	1.78	2.20
			II+		0.20	0.13	0.25	0.58
			III+		N/A	0.26	0	0.26
All				0.43	0.58	2.03	3.04	
Sourd		I+		0.43	0.11	1.06	1.60	
		II+		0.14	0.07	0.14	0.35	
		III+		N/A	0.16	0.22	0.38	
		All		0.57	0.34	1.42	2.33	
Both		All		0.97	0.92	3.45	5.34	
		Other	All	0.25	0.17	0	0.42	
All		All		1.21	1.10	3.80	5.11	

Table 10. Clerk creel survey summaries for Kimball Pond.

	Brook trout		Year				
	Genetic group	Age	1998	1999	2000	All	
No. anglers surveyed			147	92	120	359	
No. angler hours Surveyed			327	183	263	773	
No. (%) anglers successful in catching a legal BKT	All	All	18 (12)	14 (15)	20 (17)	52 (14)	
No. legal BKT kept	Kenn	I+	0	0	1	1	
		II+	5	0	2	7	
		III+	N/A	3	0	3	
		All	5	3	3	11	
	Sourd	I+	0	0	0	0	
		II+	2	0	0	2	
		III+	N/A	1	0	1	
		All	2	1	0	3	
	Both	All	7	4	3	14	
	Other	All	4	5	10	19	
All	All	11	9	13	33		
No. (%) legal BKT released	All	All	41 (77)	15 (63)	19 (59)	75 (69)	
No. legal BKT caught per angler (kept + released)	All	All	0.34	0.26	0.32	0.30	
No. (%) sublegal BKT	All		199 (83)	199 (89)	256 (89)	654 (86)	
No. legal BKT per angler (only those kept)	Kenn	I+	0	0	0.01	0	
		II+	0.03	0	0.02	0.02	
		III+	N/A	0.03	0	0.01	
		All	0.04	0.03	0.03	0.03	
	Sourd	I+	0	0	0	0	
		II+	0.01	0	0	0.01	
		III+	N/A	0.01	0	0	
		All	0.01	0.01	0	0.02	
	Both	All	0.05	0.04	0.03	0.03	
	Other	All	0.03	0.05	0.08	0.03	
	All	All	0.08	0.10	0.11	0.09	
	Hours to catch a legal BKT (all legal fish caught)	All	All	6.5	7.6	8.2	7.2
	Estimated total annual BKT harvest ±CI (@95%)	Kenn	I+	0	0	1	0
II+			77±26	0	2	39	
III+			N/A	42±20	0	42	
All			77	42	4	81	
Sourd		I+	0	0	0	0	
		II+	19±7	0	0	10	
		III+	N/A	14±7	0	14	
		All	19	14	0	24	
Both		All	96±33	57±27	4	77	
Other		All	58±20	71±33	10	65	
All		All	115±39	142±66	13	148	

Table 10. Clerk creel survey summaries for Kimball Pond (con't).

		Brook trout		Year			
		Genetic					
		group	Age	1998	1999	2000	All
Estimated total angler trips \pm CI (@ 95%)				1,923 \pm 654	1,416 \pm 664	1,913 \pm 478	5,252
Estimated total angler trips per acre				35 \pm 12	26 \pm 12	34 \pm 87	32
Estimated weight (Lb) of BKT harvested		Kenn	I+	0	0	0.8	0.75
			II+	56.5	0	1.4	57.9
			III+	N/A	32.2	0	32.2
			All	56.5	32.2	2.8	91.54
		Sourd	I+	0	0	0	0
			II+	0	0	0	0
			III+	N/A	11.4	0	11.4
			All	0	11.4	0	11.4
		Both	All	70.4	43.6	2.8	116.8
		Other	All	60.4	49.3	.	109.7
		All	All	128.9	92.9	9.3	231.1
Estimated weight (Lb/a) of BKT harvested		Kenn	I+	0	0	0.01	0.01
			II+	0.03	0	0.03	0.06
			III+	N/A	0.59	0	0.59
			All	0.03	0.59	0.05	0.67
		Sourd	I+	0	0	0	0
			II+	0	0	0	0
			III+	N/A	0.21	0	0.21
		All		0	0.21	0	0.21
		Both	All	1.28	0.79	0.05	2.12
		Other	All	1.10	0.90	.	2.00
		All	All	2.34	1.69	0.17	4.20

Table 11. Clerk creel survey summaries for McIntire Pond.

	Brook trout		Year				
	Genetic group	Age	1998	1999	2000	All	
No. anglers surveyed			32	27	37	96	
No. angler hours surveyed			83	98	99	280	
No. (%) anglers successful in catching a legal BKT	All	All	2 (5)	10 (37)	10 (27)	22 (23)	
No. legal BKT kept	Kenn	I+	0	1	0	1	
		II+	N/A	0	1	1	
		III+	N/A	N/A	0	0	
		All	0	1	1	2	
	Sourd	I+	0	0	1	1	
		II+	N/A	2	1	3	
		III+	N/A	N/A	1	1	
		All	0	2	3	5	
	Both	All	0	4	4	8	
	Other	All	6	1	1	8	
	All	All	6	5	5	16	
No. (%) legal BKT released	All	All	23 (78)	9 (68)	12 (71)	44 (73)	
No. legal BKT caught per angler (kept + released)	All	All	0.91	0.52	0.46	0.61	
No. (%) sublegal BKT	All		30 (57)	36 (72)	38 (69)	104 (63)	
No. legal BKT per angler (only those kept)	Kenn	I+	0	0	0	0.01	
		II+	N/A	0.04	0.03	0.02	
		III+			0	0	
		All	0	0.04	0.03	0.02	
	Sourd	I+	0	0	0.03	0.01	
		II+	N/A	0.11	0.03	0.04	
		III+			0.03	0.03	
		All	0	0.11	0.08	0.05	
	Both	All	0	0.15	0.11	0.08	
	Other	All	0.19	0.04	0.03	0.08	
	All	All	0.19	0.19	0.14	0.17	
	Hours to catch a legal BKT (<u>all</u> legal fish caught)	All	All	2.5	7.0	19.8	4.7
	Estimated total annual BKT harvest \pm CI (@95%)	Kenn	I+	0	0	0	0
II+			N/A	15 \pm 5	18 \pm 6	33	
III+			N/A	N/A	0	0	
All			0	15 \pm 5	18 \pm 6	33	
Sourd		I+	0	0	18 \pm 6	18	
		II+	N/A	42 \pm 13	18 \pm 6	60	
		III+	N/A	N/A	18 \pm 6	18 \pm 6	
		All	0	42 \pm 13	54	96	
Both		All	0	57 \pm 17	72	129	
Other		All	68 \pm 28	15 \pm 5	18 \pm 6	101	
All		All	68 \pm 286	72 \pm 22	90	230	

Table 11. Clerk creel survey summaries for McIntire Pond (con't).

	Brook trout		Year			
	Genetic group	Age	1998	1999	2000	All
Estimated total angler trips \pm CI (@ 95%)			356 \pm 146	378 \pm 116	589 \pm 189	1,323
Estimated total angler trips per acre			18 \pm 7	19 \pm 6	29 \pm 9	22
Estimated weight (Lb) of BKT harvested	Kenn	I+	0	0	0	0
		II+	N/A	13.22	.	.
		III+	N/A	N/A	.	.
		All	0	13.22	.	.
	Sourd	I+	0	0	.	.
		II+	N/A	30.07	.	.
		III+	N/A	N/A	.	.
		All	0	30.07	.	.
	Both	All	0	43.29	.	.
	Other	All	56.17	.	.	.
	All	All	56.17	.	.	.
	Estimated weight (Lb/a) of BKT harvested	Kenn	I+	0	0.66	.
II+			N/A	0	.	.
III+			N/A	N/A	.	.
All			0	0.66	.	.
Sourd		I+	0	0	.	.
		II+	N/A	1.50	.	.
		III+	N/A	N/A	.	.
		All	0	1.50	.	.
Both		All	0	2.16	.	.
Other		All	2.81	0	.	.
All		All	2.81	0	.	.

Table 12. Clerk creel survey summaries for Egypt, Kimball, and McIntire ponds.

	Brook trout		Year				
	Genetic	Age	1998	1999	2000	All	
No. anglers surveyed			396	261	355	1,012	
No. angler hours surveyed			807	549	779	2,135	
No. (%) anglers successful in catching a legal BKT	All	All	78 (20)	49 (19)	111 (31)	238 (24)	
No. legal BKT kept	Kenn	I+	6	5	37	48	
		II+	9	3	7	19	
		III+	N/A	5	0	5	
		All	15	13	44	72	
	Sourd	I+	15	5	29	49	
		II+	4	5	4	13	
		III+	N/A	2	3	5	
		All	19	12	36	67	
	Both	All	34	25	80	139	
	Other	All	14	8	11	33	
	All	All	48	33	91	172	
	No. (%) legal BKT released	All	All	90 (65)	68 (67)	243 (73)	401 (70)
	No. legal BKT caught per angler (kept + released)	All	All	0.35	0.39	0.94	0.57
No. (%) sublegal BKT	All		469 (77)	332 (76)	361 (52)	1,162 (67)	
No. legal BKT per angler (only those kept)	Kenn	I+	0.02	0.02	0.10	0.05	
		II+	0.02	0.01	0.02	0.02	
		III+	N/A	0.02	0	0	
		All	0.04	0.05	0.12	0.07	
	Sourd	I+	0.04	0.02	0.08	0.05	
		II+	0.01	0.02	0.01	0.01	
		III+	N/A	0.01	0.01	0	
		All	0.05	0.05	0.10	0.07	
	Both	All	0.09	0.10	0.23	0.14	
	Other	All	0.04	0.03	0.03	0.03	
	All	All	0.12	0.13	0.26	0.17	
	Hours to catch a legal BKT (all legal fish caught)	All	All	5.8	5.4	2.3	3.7
	Estimated total annual BKT harvest \pm CI (@95%)	Kenn	I+	70	45	418	533
II+			100	26	66	192	
III+			N/A	53	0	53	
All			170	124	484	778	
Sourd		I+	163	45	342	550	
		II+	42	53	44	139	
		III+	N/A	25	31	56	
		All	205	123	448	776	
Both		All	375	259	932	1,556	
Other		All	173	97	28	298	
All		All	548	370	959	1,877	

Table 12. Clerk creel survey summaries for Egypt, Kimball, and McIntire ponds (con't).

	Brook trout		Year			
	Genetic group	Age	1998	1999	2000	All
Estimated total angler trips \pm CI (@95%)			4,605	2,911	4,816	12,332
Estimated total angler trips per acre			31	22	34	29
Estimated weight (Lb/a) of BKT harvested	Kenn	I+	0.10	0.09	1.79	1.98
		II+	0.59	0.16	0.28	1.03
		III+	N/A	0.36	0	0.36
		All	0.69	0.61	2.08	3.38
	Sourd	I+	0.19	0.05	1.06	1.30
		II+	0.07	0.25	0.14	0.46
		III+	N/A	0.15	0.22	0.37
		All	0.26	0.45	1.42	2.13
	Both	All	0.95	1.05	3.49	5.49
	Other	All	0.98	0.51	.	1.49
	All	All	1.91	1.38	3.97	7.26

Table 13. Mean length (mm) and weight (g) by genetic group of brook trout sampled during the **summer** months.

Year	Water	Sampling method	Age	Size variable	Genetic group			
					Kennebago	Sourdnahunk	All	
1998	Egypt P	Clerk survey	I+	Length	219±11 (6)	210±3 (15)	213±4 (21)	
				Weight	88±16 (6)	72±4 (13)	77±6 (19)	
			II+	Length	288±31 (3)	259±17 (2)	276±19 (5)	
				Weight	259±17 (2)	160 (1)	210±55 (3)	
			Kimball P	II+	Length	330±9 (6)	285±5 (2)	318±10 (8)
					Weight	333±41 (6)		333±41 (6)
	Monroe P (East)	Gillnet	II+	Length	355±16 (2)	353±14 (7)	354±11 (9)	
				Weight	535±5 (2)	557±65 (6)	551±48 (8)	
	1999	Egypt Pond	Clerk survey	I+	Length	206±7 (13)	205±7 (5)	206±5 (18)
					Weight	99±19 (6)	66±8 (4)	86±13 (10)
II+				Length	370±6 (2)	325 (1)	355±15 (3)	
				Weight	655±75 (2)	390 (1)	357±98 (3)	
III+				Length	300±90 (2)	247±57 (2)	274±46 (4)	
				Weight	320±250 (2)	176±75 (2)	248±122 (4)	
Kimball Pond		Clerk Survey	III+	Length	335±10 (3)	325 (1)	333±7 (4)	
				Weight	343±3 (3)	370 (1)	350±7 (4)	
McIntire Pond		Clerk Survey	II+	Length	329 (1)	323±7 (3)	325±5 (4)	
				Weight	400 (1)	325±35 (2)	350±32 (3)	
2000		Egypt Pond	Clerk survey	I+	Length	245±4 (36)	227±4 (28)	237±3 (64)
					Weight	116±11 (35)	89±9 (21)	105±7 (56)
	II+			Length	253±21 (4)	259±5 (3)	255±12 (7)	
				Weight	149±57 (4)	142±4 (3)	146±31 (7)	
	III+			Length		346±13 (2)	346±13 (2)	
				Weight		470±5 (2)	470±5 (2)	

Table 13. Mean length (mm) and weight (g) by genetic group of brook trout sampled during the **summer** months (con't).

Year	Water	Sampling method	Age	Size variable	Genetic group					
					Kennebago	Sourdnahunk	All			
2000 (con't)	Kimball P	Clerk Survey	I+	Length	343 (1)		343 (1)			
				Weight	340 (1)		340 (1)			
			II+	Length	325±5 (2)		325±5 (2)			
				Weight	315±15 (2)		315±15 (2)			
	Monroe P (East)	Gillnet	II+	Length	335±3 (5)	311±5 (8)	320±5 (13)			
				Weight	421±21 (5)	322±14 (8)	360±18 (13)			
			All	All	All	I+	Length	235±4 (56)	219±3 (48)	228±3 (104)
							Weight	115±10 (48)	80±5 (38)	100±6 (86)
All	All	All	II+	Length	318±9 (25)	312±8 (26)	315±6 (51)			
				Weight	358±33 (24)	359±37 (21)	358±24 (45)			
			III+	Length	321±30 (5)	302±29 (5)	312±20 (10)			
				Weight	334±79 (5)	332±29 (5)	333±52 (10)			
All	All	All	All	Length	264±6 (86)	255±6 (79)	260±4 (165)			
				Weight	205±18 (77)	191±22 (64)	199±14 (141)			

Table 14. Mean length (mm), and weight (g) by genetic group of brook trout sampled in the **fall**. Sample sizes in parentheses.

Water(s)	Year sampled	Age	Size variable	Genetic group		
				Kennebago	Sourdnahunk	All
Broken Bridge P	1999	III+	Length	445 (1)		445 (1)
			Weight	920 (1)		920 (1)
Egypt P	1998	I+	Length	277 (1)	210 (1)	244±34 (2)
			Weight	200 (1)	70 (1)	135±65 (2)
		II+	Length	400 (1)		400 (1)
			Weight	625 (1)		625 (1)
	1999	I+	Length	274±10 (3)	238±8 (7)	247±10 (10)
			Weight	183±32 (2)	93±16 (6)	116±20 (8)
		II+	Length	397 (1)	269±1 (2)	333±65 (3)
			Weight	540 (1)	165 (1)	353±188 (2)
	2000	I+	Length	247±9 (16)	236±8 (13)	238±5 (28)
			Weight	144±22 (16)	114±13 (13)	116±9 (28)
		II+	Length	336 (1)		336 (1)
			Weight	350 (1)		350 (1)
Jaybird P	1997	I+	Length	205±8 (3)	184±6 (5)	192±6 (8)
			Weight	67±12 (3)	38±3 (4)	50±8 (7)
	1998	I+	Length	223±24 (2)	211±7 (3)	216±9 (5)
			Weight	93±23 (2)	57±3 (3)	71±11 (5)
	1999	II+	Length	287 (1)		287 (1)
			Weight	190 (1)		190 (1)
		III+	Length		270 (1)	270 (1)
			Weight		145 (1)	145 (1)
Kimball P	1998	I+	Length	254±2 (57)	254±2 (55)	254±2 (112)
			Weight	140±4 (56)	137±4 (54)	139±3 (110)

Table 14. Mean length (mm), and weight (g) by genetic group of brook trout sampled in the **fall**. Sample sizes in parentheses (con't).

Water(s)	Year sampled	Age	Size variable	Genetic group			
				Kennebago	Sourdnahunk	All	
Kimball P (con't)	1999	I+	Length	266±1 (152)	259±2 (68)	264±1 (220)	
			Weight	160±3 (113)	139±4 (55)	152±2 (168)	
	1998	II+	Length	305±2 (86)	293±1 (88)	299±1 (174)	
			Weight	260±7 (86)	224±5 (85)	242±4 (171)	
	1999	II+	Length	321±2 (93)	310±3 (24)	318±2 (117)	
			Weight	310±8 (41)	259±12 (18)	295±7 (59)	
		III+	Length	362±5 (41)	351±4 (20)	358±4 (61)	
			Weight	451±34 (18)	378±38 (7)	430±27 (25)	
	2000	I+	Length	271±2 (119)	260±2 (65)	267±1 (184)	
			Weight	195±4 (119)	161±5 (65)	183±3 (184)	
		II+	Length	323±5 (28)	303±7 (18)	317±4 (46)	
			Weight	361±13 (27)	288±23 (18)	332±13 (45)	
		III+	Length	369±19 (5)	345±6 (3)	360±12 (8)	
			Weight	603±145 (4)	423±16 (3)	526±86 (7)	
		IV+	Length	415±22 (4)	350±10 (2)	393±20 (6)	
			Weight	894±162 (4)	432±33 (2)	740±142 (6)	
	McIntire P	1998	I+	Length	251±2 (35)	261±2 (50)	257±2 (85)
				Weight	159±5 (35)	172±4 (50)	167±3 (85)
1999		I+	Length	249±5 (18)	250±3 (45)	250±3 (63)	
			Weight	190±11 (18)	194±8 (45)	193±6 (63)	
1999		II+	Length	341±12 (5)	329±3 (8)	333±5 (13)	
			Weight	395±50 (5)	379±18 (8)	385±21 (13)	
2000		I+	Length	279±3 (40)	273±3 (55)	276±2 (96)	
			Weight	244±7 (40)	239±8 (55)	242±5 (96)	

Table 14. Mean length (mm), and weight (g) by genetic group of brook trout sampled in the **fall**. Sample sizes in parentheses (con't).

Water(s)	Year sampled	Age	Size variable	Genetic group		
				Kennebago	Sourdnahunk	All
McIntire P (con't)	2000	II+	Length	356±5 (13)	343±4 (10)	350±3 (23)
			Weight	505±22 (13)	452±21 (10)	482±16 (23)
		III+	Length	420±9 (2)	378±7 (3)	395±11 (5)
			Weight	753±43 (2)	625±32 (3)	676±38 (5)
Monroe P (East)	1997	I+	Length	274±7 (10)	236±9 (7)	258±7 (17)
			Weight	214±14 (10)	142±21 (7)	184±14 (17)
	1998	II+	Length		381±4 (4)	381±4 (4)
			Weight		653±25 (4)	653±25 (4)
	1999	I+	Length	276±11 (7)	272±6 (9)	274±6 (16)
			Weight	196±16 (7)	204±15 (9)	200±11 (16)
Monroe P (West)	1998	I+	Length	261±4 (42)	242±2 (24)	254±3 (66)
			Weight	149±7 (42)	110±3 (24)	135±5 (66)
	2000	I+	Length	280±11 (5)	227±4 (4)	256±11 (9)
			Weight	232±30 (5)	103±3 (4)	174±28 (9)
		III+	Length		414 (1)	414 (1)
			Weight		640 (1)	640 (1)
All	All	I+	Length	264±1 (468)	256±1 (485)	260±1 (953)
			Weight	174±2 (467)	164±3 (483)	169±2 (950)
		II+	Length	316±2 (184)	300±3 (154)	309±2 (338)
			Weight	306±8 (183)	266±9 (151)	288±6 (334)
		III+	Length	368±7 (26)	350±9 (15)	361±6 (41)
			Weight	518±41 (25)	438±39 (15)	488±30 (40)
		IV+	Length	415±22 (4)	350±10 (2)	393±20 (6)
			Weight	894±162 (4)	433±33 (2)	740±142 (6)

Table 14. Mean length (mm), and weight (g) by genetic group of brook trout sampled in the **fall**. Sample sizes in parentheses (con't).

Water(s)	Year sampled	Age	Size variable	Genetic group		
				Kennebago	Sourdnahunk	All
All (con't)	All	All	Length	283±1 (682)	269±1 (656)	276±1 (1,338)
			Weight	227±5 (679)	195±4 (651)	211±3 (1,330)

Table 15. Mean length (mm) and weight (g) of unmarked brook trout sampled at McIntire Pond in the fall of 2000. Sample sizes in parentheses.

Age	Length	Weight
II+	252±6 (16)	195±17 (16)

Table 16. T test for differences in sizes of ages I+ and II+ brook trout sampled from study lakes during the fall season, 1998-2000. Significantly larger values and $\text{prob} > |T|$ are **bolded**.

Genetic group	Age	Size variable	Value	N	Prob > T
Kennebago Sourdnahunk	I+	Length	264±1	455	0.0001
			257±1	385	
Kennebago Sourdnahunk	I+	Weight	174±2	454	0.0081
			164±3	247	
Kennebago Sourdnahunk	I+	Condition	0.927±0.007	454	0.2228
			0.943±0.010	384	
Kennebago Sourdnahunk	II+	Length	316±2	183	0.0001
			298±2	149	
Kennebago Sourdnahunk	II+	Weight	307±8	182	0.0093
			254±8	146	
Kennebago Sourdnahunk	II+	Condition	0.936±0.008	182	0.1308
			0.918±0.009	146	
Kennebago Sourdnahunk	III+	Length	364±7	25	0.3907
			356±8	14	
Kennebago Sourdnahunk	III+	Weight	501±39	24	0.4398
			459±36	14	
Kennebago Sourdnahunk	III+	Condition	0.991±0.025	24	0.8997
			0.996±0.030	14	

Table 17. Duncan's multiple range test for differences in sizes of age I+ and age II+ brook trout sampled from study lakes, 1998-2000. Means joined by vertical lines are not significantly different. Sample size in parentheses.

Age I+											
Mean length		Mean weight				Mean condition					
Kennebago		Sourdnahunk		Kennebago		Sourdnahunk		Kennebago		Sourdnahunk	
Kimball	266	McIntire	262	McIntire	202	McIntire	203	McIntire	1.098	McIntire	1.106
	(288)		(150)		(93)		(150)		(93)		(150)
Monroe	261	Kimball	258	Kimball	170	Kimball	146	Kimball	0.893	Kimball	0.846
(West)	(47)		(175)		(287)		(174)		(287)		(174)
McIntire	262	Monroe	240	Monroe	158	Monroe	109	Monroe	0.842	Monroe	0.798
	(93)	(West)	(28)	(West)	(47)	(West)	(28)	(West)	(47)	(West)	(28)
Egypt	247	Egypt	235	Egypt	130	Egypt	106	Egypt	0.830	Egypt	0.788
	(18)		(20)		(18)		(20)		(18)		(20)

Age II+											
Mean length		Mean weight				Mean condition					
Kennebago		Sourdnahunk		Kennebago		Sourdnahunk		Kennebago		Sourdnahunk	
McIntire	352	McIntire	337	McIntire	474	McIntire	419	McIntire	1.074	McIntire	1.092
	(18)		(18)		(18)		(18)		(18)		(18)
Kimball	313	Kimball	296	Kimball	290	Kimball	239	Kimball	0.923	Kimball	0.900
	(155)		(124)		(154)		(121)		(154)		(121)

Table 18. Mean length (mm), and weight (g) by genetic group of two genetic groups of age I+ brook trout sampled in the **fall**. Sample sizes in parentheses.

Waters	Years	Genetic group	Size variable	
			Length	Weight
Pike Brook Ponds (East and West), Pineo Pond	1988-92	Domestic (Maine hatchery strain; MHS x Assinica)	284±2 (355)	285±9 (347)
Egypt Pond, Kimball Pond, Jaybird Pond, Monroe Ponds (East and West)	1997-99	Kennebago and Sourdnahunk	257±1 (401)	145±2 (398)
T			42.0146	33.7606
P			0.0001	0.0001

Table 19. Post-season estimates of brook trout abundance and weight (lb) by genetic group.

Water	Year	Age	Variable	Genetic group			Other ¹²	All
				Kennebago	Sourdnahunk	Both		
Egypt P	2000	I+	Number	29 (17-111)	20 (13-45)	51 (33-117)		
			Number/acre	0.48	0.33	0.85		
			Lb	9.19	5.03	130.55		
			Lb/acre	0.15	0.08	2.18		
		II+	Number	1 captured	0			
			Number/acre					
			Lb	0.77				
			Lb/acre					
		All	Number	34 (20-125)	20 (13-45)	50 (33-101)		42 (31-65)
			Number/acre	0.57	0.33	0.83		0.70
			Lb	10.77	5.03	12.78		
			Lb/acre	0.18	0.08	0.21		
Kimball P	1998	I+	Number	94 (76-125)	97 (77-131)	192 (163-233)		
			Number/acre	1.71	1.76	3.49		
			Lb	28.99	29.27	58.61		
			Lb/acre	0.53	0.53	1.07		
		II+	Number	143 (114-188)	156 (124-210)	298 (253-362)		
			Number/acre	2.60	2.84	5.42		
			Lb	81.77	76.90	158.71		
			Lb/acre	1.49	1.40	2.89		
		All	Number	237 (190-313)	253 (201-341)	490 (416-595)	37 (24-78)	526 (450-631)
			Number/acre	4.31	4.60	8.91	0.67	9.56
			Lb	110.88	105.94	217.37	13.64	233.34
			Lb/acre	2.02	1.93	3.95	0.24	4.24
	1999	I+	Number	235 (178-347)	138 (90-303)	330 (270-425)		
			Number/acre	4.27	2.51	6.78		
			Lb	72.98	41.64	114.62		
			Lb/acre	1.33	0.76	2.09		
		II+	Number	47 (37-64)	25 (15-83)	71 (63-82)		
			Number/acre	0.85	0.45	1.31		
			Lb	32.09	14.26	46.35		
			Lb/acre	0.58	0.26	0.84		

¹²Wild and older-age stocked brook trout of various genetic groups planted prior to initiation of study.

Table 19. Post-season estimates of brook trout abundance and weight (lb) by genetic group (con't).

Water	Year	Age	Variable	Genetic group			Other ¹³	All
				Kennebago	Sourdnahunk	Both		
Kimball P (con't)	1999	III+	Number	16 (12-27)	6 (4-12)	25 (20-32)		
			Number/acre	0.29	0.11	0.40		
			Lb	15.89	5.00	20.89		
			Lb/acre	0.29	0.09	0.38		
	All	All	Number	237 (201-291)	128 (96-190)	366 (335-405)	12 (8-27)	396 (343-468)
			Number/acre	4.31	2.33	6.64	0.22	
			Lb	120.96	60.90	181.86		
			Lb/acre	2.20	1.11	3.31		
	2000	I+	Number	217 (196-244)	197 (145-310)	389 (339-455)		
			Number/acre	3.95	3.58	7.07		
			Lb	93.30	69.64	156.75		
			Lb/acre	1.70	1.27	2.85		
		II+	Number	37 (27-57)	40 (26-83)	71 (61-85)		
			Number/acre	0.67	0.73	1.29		
			Lb	29.41	25.36	51.87		
			Lb/acre	0.53	0.46	0.94		
		III+	Number	5 (4-6)	4 (3-7)	9 (6-20)		
			Number/acre	0.09	0.07	0.16		
			Lb	6.64	3.73	10.42		
			Lb/acre	0.12	0.07	0.19		
IV+	Number	10 (7-18)	1 captured	13 (9-28)				
	Number/acre	0.18		0.24				
	Lb	19.67	0.95	19.13				
	Lb/acre	0.36		0.35				
All	All	Number	259 (238-284)	229 (181-313)	461 (418-514)	26 (22-33)	477 (441-521)	
		Number/acre	4.71	4.16	8.38	0.47	8.67	
		Lb	149.02	98.73	238.17	5.85	491.77	
		Lb/acre	2.71	1.80	4.33	0.11	8.94	
All	I+	Number	165	118	283			
		Number/acre	3.00	2.15	5.15			
		Lb	50.99	35.46	86.62			
		Lb/acre	0.93	0.64	1.57			

¹³Wild and older-age stocked brook trout of various genetic groups planted prior to initiation of study.

Table 19. Post-season estimates of brook trout abundance and weight (lb) by genetic group (con't).

Water	Year	Age	Variable	Genetic group			Other ¹⁴	All
				Kennebago	Sourdnahunk	Both		
Kimball P (con't)	2000	II+	Number	95	91	185		
			Number/acre	1.73	1.65	3.36		
			Lb	56.93	45.58	102.53		
			Lb/acre	1.04	0.83	1.86		
		III+	Number	16	6	22		
			Number/acre	0.29	0.11	0.40		
			Lb	15.89	5.00	20.89		
			Lb/acre	0.29	0.09	0.38		
		All	Number	276	215	490		
			Number/acre	5.02	3.91	8.91		
			Lb	123.81	86.04	210.04		
			Lb/acre	2.25	1.56	3.82		
McIntire P	1998	I+	Number	147 (79-1096)	149 (92-382)	307 (180-1041)		
			Number/acre	7.35	7.45	15.35		
			Lb	51.58	56.55	112.86		
			Lb/acre	2.58	2.83	5.64		
		II+	Number				14 (9-26)	
			Number/acre				0.70	
			Lb				12.38	
			Lb/acre				0.62	
		All	Number					252 (181-416)
			Number/acre					12.60
			Lb					107.57
			Lb/acre					5.38
	1999	I+	Number	43 (27-100)	88 (63-142)	129 (93-210)		
			Number/acre	2.15	4.40	6.55		
			Lb	18.04	37.66	55.70		
			Lb/acre	0.90	1.88	2.78		
		II+	Number	14 (8-55)	13 (9-25)	28 (18-58)		
			Number/acre	0.70	0.65	1.35		
			Lb	12.19	10.87	23.06		
			Lb/acre	0.61	0.54	1.15		

¹⁴Wild and older-age stocked brook trout of various genetic groups planted prior to initiation of study.

Table 19. Post-season estimates of brook trout abundance and weight (lb) by genetic group (con't).

Water	Year	Age	Variable	Genetic group				All
				Kennebago	Sourdnaunk	Both	Other ¹⁵	
McIntire P (con't)	1999	III+	Number				5 (5-5)	
			Number/acre				0.25	
			Lb				7.25	
			Lb/acre				0.36	
	All	Number	56 (42-86)	100 (76-147)	155 (120-218)	5 (5-5)	128 (103-170)	
			2.80	5.00	7.8	0.25	8.05	
			30.23	48.53	78.76	7.25	80.01	
			1.51	2.42	3.94	0.36	4.30	
	2000	I+	Number	91 (61-179)	115 (86-173)	207 (156-307)		
			Number/acre	4.55	5.75	10.35		
			Lb	48.99	60.54	110.34		
			Lb/acre	2.45	3.03	5.52		
		II+	Number	16 (12-24)	25	34 (24-55)		
			Number/acre	0.80	1.25	1.70		
			Lb	17.78	24.86	36.06		
			Lb/acre	0.89	1.24	1.80		
		III+	Number	3 (2-3)	4 (3-6)	6		
			Number/acre	0.15	0.20	0.3		
			Lb	4.97	5.51	8.93		
			Lb/acre	0.25	0.28	0.45		
IV+	Number				1 (1-1)			
	Number/acre				0.05			
	Lb				2.13			
	Lb/acre				0.11			
All	Number	94 (72-134)	139 (102-219)	232 (187-304)		276 (241-325)		
		4.70	6.95	11.6		13.8		
		67.17	87.96	158.01				
		3.36	4.40	7.90				
All	I+	Number	95	119	219			
		Number/acre	4.75	5.93	10.95			
		Lb	34.81	47.11	84.28			
		Lb/acre	1.74	2.36	4.21			

¹⁵Wild and older-age stocked brook trout of various genetic groups planted prior to initiation of study.

Table 19. Post-season estimates of brook trout abundance and weight (lb) by genetic group (con't).

Water	Year	Age	Variable	Genetic group			Other ¹⁶	All
				Kennebago	Sourdnahunk	Both		
McIntire P (con't)	All	II+	Number	14 (8-55)	13 (9-25)	27		
			Number/acre	0.70	0.65	1.35		
			Lb	12.19	10.87	23.06		
			Lb/acre	0.61	0.54	1.15		
	All	All	Number	109	132	246		
			Number/acre	5.45	6.60	12.30		
			Lb	47.00	57.98	107.34		
			Lb/acre	2.35	2.90	5.37		
Monroe P (West)	1998	I+	Number	88 (54-232)	110 (46-284)	168 (107-387)		
			Number/acre	6.77	8.46	12.92		
			Lb	28.88	26.65	49.96		
			Lb/acre	2.22	2.05	3.84		
All	1998	I+	Number/acre	5.28	5.89	10.59		
			Lb/acre	1.78	1.80	3.52		
		II+	Number/acre	2.60	2.84	5.42		
			Lb/acre	1.49	1.40	2.89		
		All	Number/acre	7.88	8.73	16.01		
			Lb/acre	3.27	3.20	6.41		
	1999	I+	Number/acre	3.21	3.46	6.67		
			Lb/acre	1.12	1.32	2.44		
		II+	Number/acre	0.78	0.55	1.33		
			Lb/acre	0.60	0.40	1.00		
		III+	Number/acre	0.29	0.11	0.40		
			Lb/acre	0.29	0.09	0.38		
		All	Number/acre	4.28	4.12	8.40		
			Lb/acre	2.01	1.81	3.82		

¹⁶Wild and older-age stocked brook trout of various genetic groups planted prior to initiation of study.

Table 19. Post-season estimates of brook trout abundance and weight (lb) by genetic group (con't).

Water	Year	Age	Variable	Genetic group			Other ¹⁷	All	
				Kennebago	Sourdnahunk	Both			
All (con't)	2000	I+	Number/acre	2.99	3.22	6.09			
			Lb/acre	1.43	1.46	3.52			
		II+	Number/acre	0.49	0.66	1.00			
			Lb/acre	0.47	0.57	0.91			
		III+	Number/acre	0.08	0.09	0.15			
			Lb/acre	0.12	0.12	0.21			
	IV+	Number/acre	0.09	0	0.12				
		Lb/acre	0.18	0	0.18				
	All	Number/acre	3.65	3.97	7.36				
		Lb/acre	2.20	2.15	4.82				
	All		I+	Number/acre	3.83	4.19	7.78		
				Lb/acre	1.44	1.53	3.16		
			II+	Number/acre	1.29	1.35	2.58		
				Lb/acre	0.85	0.79	1.60		
III+			Number/acre	0.19	0.10	0.28			
			Lb/acre	0.21	0.11	0.30			
IV+	Number/acre	0.09	0	0.09					
	Lb/acre	0.18	0	0.18					
All	Number/acre	5.27	5.61	10.59					
	Lb/acre	2.49	2.39	5.02					

¹⁷Wild and older-age stocked brook trout of various genetic groups planted prior to initiation of study.

Table 20. Test results for significant differences between the capture rates by netting of Kennebago and Sourdnahunk brook trout from study lakes, 1998 and 1999. Sample size in parentheses. Significant differences bolded for emphasis.

Test and statistics	Genetic group	Age	Analysis variable	Population variable	Water			All
					Kimball P	McIntire P	West Monroe P	
Chi-square	Kennebago	I+	Number	Stocked	5600	600	500	6700
Percent captured				Captured	328	93	47	468
					5.9	15.5	9.4	7.0
	Sourdnahunk	I+	Number	Stocked	5600	600	500	6700
Percent captured				Captured	188	150	28	366
					3.4	25.0	5.6	5.5
X^2					39.819	16.765	5.204	13.303
P					0.001	0.001	0.023	0.001
Chi-square	Kennebago	II+	Number	Stocked	5600	600	500	6700
Percent captured				Captured	207	18	0	225
					3.7	3.0	0	3.4
	Sourdnahunk	II+	Number	Stocked	5600	600	500	6700
Percent captured				Captured	130	18	0	148
					2.3	3.0	0	2.2
X^2					18.139	0		16.351
P					0.001	1		0.001
Chi-square	Kennebago	III+	Number	Stocked	5600	600	500	6700
Percent captured				Captured	46	2	0	48
					0.8	0.3	0	0.7
	Sourdnahunk	III+	Number	Stocked	5600	600	500	6700
Percent captured				Captured	23	3	1	27
					0.4	0.5	0.2	0.4
X^2					7.714			5.913
P					0.005			0.015
Chi-square	Kennebago	All	Number	Stocked	5600	600	500	6700
Percent captured				Captured	581	113	47	741
					10.4	18.8	9.4	11.1
	Sourdnahunk	All	Number	Stocked	5600	600	500	6700
Percent captured				Captured	341	171	29	541
					6.1	28.5	5.8	8.1
X^2					68.077	15.518	4.614	34.502
P					0.001	0.001	0.032	0.001

Table 21. Results of Chi-square test for differences between Kennebago and Sourdnahunk brook trout from study lakes, 1998-2000. Percent in parentheses. Significant differences bolded for emphasis.

Genetic Group	Statistic	Age	Analysis variable	Populaltion variable	All (%)
Kennebago		I+	Number	Mature	269 (84)
				Immature	52 (16)
Sourdnahunk				Mature	172 (59)
				Immature	122 (41)
	X ²				48.404
	P				0.001

Kennebago		II+	Number	Mature	139 (100)
				Immature	0 (0)
Sourdnahunk				Mature	127 (100)
				Immature	0 (0)

Kennebago		III+	Number	Mature	12 (92)
				Immature	1 (8)
Sourdnahunk				Mature	18 (100)
				Immature	0 (0)
	X ²				1.431
	P				0.232

Both		I+	Number	Mature	441 (72)
				Immature	174 (28)

Domestic ¹⁸		I+	Number	Mature	70 (74)
				Immature	21 (26)

¹⁸Sampled 1988-92.

Table 22. Relative size and proportion of brook trout with hooking injuries sampled during the fall by trapnetting.

Water	Genetic group	Year(s)	Age	Size variable	Hooking injury noted		Percent With hooking injury	
					No	Yes		
Egypt P	Kennebago	1999-2000	I+	Length	247±9 (16)	277±14 (2)	11.1	
				Weight	143±22	188±38 (2)		
				Cond	0.888±0.072	0.874±0.049		
			II+	Length	397 (1)	336 (1)	50.0	
				Weight	540	350 (1)		
				Cond	0.863	0.923		
	All	Length	256±12 (17)	296±21 (3)	15.0			
		Weight	166±31 (17)	242±58 (3)				
		Cond	0.886±0.067	0.890±0.033				
	Sourdnahunk	I+		Length	236±7 (16)	238±14 (3)	15.8	
				Weight	107±11 (16)	113±36 (3)		
				Cond	0.791±0.049	0.784±0.100		
II+			Length		268 (1)	100.0		
			Weight		165 (1)			
			Cond		0.857			
All		Length	236±7 (16)	246±12 (4)				
		Weight	107±11 (16)	126±28 (4)				
		Cond	0.791±0.049	0.802±0.073				
Kimball P	Kennebago	1998-2000	I+	Length	266±1 (219)	266±2 (71)	24.5	
				Weight	171±3 (217)	170±5 (71)		
				Cond	0.895±0.009	0.916±0.039		
			II+		Length	313±2 (97)	313±3 (59)	37.8
					Weight	293±8 (95)	287±9 (59)	
					Cond	0.950±0.019	0.934±0.036	
			III+		Length	365±8 (16)	348±10 (7)	30.4
					Weight	507±47 (16)	402±62 (6)	
					Cond	1.005±0.032	0.944±0.048	
			IV+		Length	450±20 (2)	380±7 (2)	50.0
					Weight	1,150±150 (2)	638±63 (2)	
					Cond	1.255±0.003	1.163±0.055	
	All		Length	285±2 (334)	292±3 (139)	29.4		
			Weight	228±7 (330)	237±9 (138)			
			Cond	0.918±0.008	0.928±0.025			
	Sourdnahunk	1998-2000	I+		Length	258±1 (125)	256±3 (50)	28.6
					Weight	145±3 (124)	149±6 (50)	
					Cond	0.835±0.012	0.870±0.019	
II+				Length	298±2 (80)	293±2 (44)	35.5	
				Weight	248±8 (77)	223±5 (44)		
				Cond	0.911±0.011	0.881±0.010		
III+				Length	341±9 (7)	347±7 (3)	30.0	
				Weight	384±36 (7)	408±43 (2)		
				Cond	0.952±0.036	0.972±0.047		
IV+				Length	340 (1)	360 (1)	50.0	
				Weight	400 (1)	465 (1)		
				Cond	1.018	0.997		

Table 22. Relative size and proportion of brook trout with hooking injuries sampled during the fall by trapnetting (con't).

Water	Genetic group	Year(s)	Age	Size variable	Hooking injury noted		Percent with hooking injury			
					No	Yes				
Kimball P (con't)		1998-2000	All	Length	276±2 (213)	276±3 (98)	31.5			
				Weight	192±6 (209)	193±7 (98)				
				Cond	0.868±0.009	0.879±0.011				
McIntire P Kennebago		1998-2000	I+	Length	262±2 (92)	263 (1)	1.1			
				Weight	202±6 (92)	200				
				Cond	1.097±0.016	1.099				
			II+	Length	354±4 (17)	311 (1)	5.6			
				Weight	484±23 (17)	310 (1)				
				Cond	1.077±0.024	1.031				
		III+	Length	420±9 (2)	(0)	0				
			Weight	753±43 (2)						
			Cond	1.015±0.008						
		All				Length	279±4 (111)	287±24 (2)	1.8	
						Weight	255±13 (111)	255±55 (2)		
						Cond	1.092±0.013	1.065±0.034		
Sourdnahunk		1998-2000	I+	Length	263±2 (142)	250±7 (7)	4.7			
				Weight	204±5 (142)	169±21 (7)				
				Cond	1.108±0.014	1.056±0.058				
		II+	Length	337±3 (17)	338 (1)	5.5				
			Weight	422±17 (17)	370 (1)					
			Cond	1.099±0.019	0.958					
		All				Length	273±3 (162)	261±12 (8)	4.7	
						Weight	235±8 (98)	194±31 (8)		
						Cond	1.108±0.012	1.044±0.052		
All	Kennebago	All	I+	Length	259±1 (186)	262±2 (38)	17.0			
				Weight	158±4 (184)	154±5 (38)				
				Cond	0.909±0.015	0.884±0.074				
			II+	Length	312±4 (85)	312±3 (48)	36.1			
				Weight	286±13 (84)	272±8 (48)				
				Cond	0.931±0.031	0.933±0.012				
			III+	Length	363±9 (12)	345±11 (6)	33.3			
				Weight	475±41 (12)	402±62 (6)				
				Cond	0.965±0.032	0.944±0.048				
			All				Length	283±2 (462)	292±3 (144)	23.8
							Weight	232±7 (458)	237±8 (143)	
							Cond	0.959±0.008	0.929±0.020	
Sourdnahunk		All	I+	Length	256±1 (171)	255±4 (34)	16.6			
				Weight	163±3 (170)	140±8 (34)				
				Cond	0.959±0.020	0.836±0.034				
			II+	Length	300±3 (75)	294±2 (39)	34.2			
				Weight	252±17 (72)	221±7 (39)				
				Cond	0.907±0.038	0.873±0.012				
III+				Length	340±12 (5)	345±12 (2)	28.6			
				Weight	367±49 (5)	405±75 (2)				
				Cond	0.909±0.033	0.974±0.081				

Table 22. Relative size and proportion of brook trout with hooking injuries sampled during the fall by trapnetting (con't).

Water	Genetic group	Year(s)	Age	Size variable	Hooking injury noted		Percent with hooking injury
					No	Yes	
All (con't)	Sourdnahunk	All	All	Length	273±2 (391)	274±3 (110)	22.0
				Weight	207±6 (387)	191±7 (110)	
				Cond	0.965±0.009	0.888±0.010	
All	All	All	I+	Length	262±1 (610)	261±2 (134)	18.0
				Weight	176±2 (607)	161±4 (134)	
				Cond	0.960±0.025	0.908±0.030	
			II+	Length	313±2 (212)	305±2 (107)	33.5
				Weight	304±5 (207)	261±6 (107)	
				Cond	0.957±0.010	0.912±0.020	
			III+	Length	364±8 (28)	348±7 (10)	26.3
				Weight	506±30 (28)	404±42 (9)	
				Cond	1.008±0.030	0.954±0.034	
			IV+	Length	413±38 (3)	373±8 (3)	50.0
				Weight	900±265 (3)	580±68 (3)	
				Cond	1.176±0.079	1.107±0.064	
All	All	All	All	Length	279±1 (853)	284±1 (254)	22.9
				Weight	219±2 (840)	216±3 (253)	
				Cond	0.961±0.020	0.914±0.025	

Table 23. Test results for significant differences between the capture rates by netting of Kennebago and Sourdnahunk brook trout from study lakes, 1998-2000. Sample size in parentheses. Significant differences bolded for emphasis.

Test and statistics	Genetic group	Age	Analysis variable	Populaltion variable	All
T test	Both	I+	Condition	With hooking injuries Without hooking injuries	0.908±0.226 (135) 0.963±0.008 (615)
T value					2.301
P					0.023
	Both	II+	Condition	With hooking injuries Without hooking injuries	0.898±0.008 (108) 0.974±0.011 (222)
T value					5.422
P					0.001
	Both	III+	Condition	With hooking injuries Without hooking injuries	0.954±0.024 (9) 1.037±0.024 (33)
T value					2.013
P					0.061
Chi-square	Kennebago	I+	Number	With hooking injuries Without hooking injuries	75 326
	Sourdnahunk	I+	Number	With hooking injuries Without hooking injuries	59 284
X ²					0.282
P					0.595
Chi-square	Kennebago	II+	Number	With hooking Injuries Without hooking injuries	60 115
	Sourdnahunk	II+	Number	With hooking injuries Without hooking injuries	47 96
Without hooking injuries					
X ²					0.071
P					0.790
Chi-square	Kennebago	III+	Number	With hooking injuries Without hooking injuries	7 18
	Sourdnahunk	III+	Number	With hooking injuries	3 10
Without hooking injuries					
X ²					0.107
P					0.744

Table 23. Test results for significant differences between the capture rates by netting of Kennebago and Sourdnahunk brook trout from study lakes, 1998-2000. Sample size in parentheses. Significant differences bolded for emphasis (con't).

Test and statistics	Genetic group	Age	Analysis variable	Population variable	All (%)
Chi-square	Kennebago	All	Number	With hooking injuries	92 (25)
				Without hooking injuries	283 (75)
	Sourdnahunk	All	Number	With hooking Injuries	75 (23)
				Without hooking injuries	251 (77)
X ²					0.224
P					0.636

Chi-square	Both, Kimball P (Artificial lures only)	I+	Number	With hooking injuries	66 (23)
				Without hooking injuries	215 (77)
	Both, McIntire P (Fly fishing only)	I+	Number	With hooking injuries	6 (4)
				Without hooking injuries	142 (96)
X ²					26.214
P					0.001

Table 24. Growth increments (mm) of brook trout stocked at study ponds by water, genetic group, and age. Sample size in parentheses.

Water	Genetic group	Year stocked	Rearing station	Age when sampled	Size variable	Mean size when stocked	Months post stocking	Mean size when sampled	Growth increment	
									Total	Per month
Egypt P	Kennebago	2000	Embden	I+	Length	217	6	247±9 (16)	30	5
					Weight	104	6	144±22 (16)	40	7
	Sourd-nahunk	2000	Embden	I+	Length	195	6	236±8 (13)	41	7
					Weight	81	6	114±13 (13)	33	6
Kimball P	Kennebago	1999	Embden	I+	Length	150	12	271±2 (119)	121	10
					Weight	33	12	195±4 (119)	162	14
					Length	157±2 (120)	12	266±1 (152)	109	9
		1998	Embden	I+	Weight	37 (120)	12	160±3 (133)	123	10
					Length	157±2 (120)	24	323±5 (28)	166	7
					Weight	37 (120)	24	361±13 (27)	324	14
	1997	Embden	I+	Length	149±2 (60)	12	254±2 (57)	105	9	
				Weight	31 (60)	12	140±4 (56)	109	9	
				Length	149±2 (60)	24	321±2 (93)	172	7	
			II+	Weight	31 (60)	24	310±8 (41)	279	12	
				Length	149±2 (60)	36	369±19 (5)	220	6	
				Weight	31 (60)	36	603±145 (4)	572	16	

Table 24. Growth increments (mm) of brook trout stocked at study ponds by water, genetic group, and age. Sample size in parentheses (con't).

Water	Genetic group	Year stocked	Rearing station	Age when sampled	Size variable	Mean size when stocked	Months post stocking	Mean size when sampled	Growth increment			
									Total	Per month		
Kimball P (con't)	Kenne- bago	1996	Palermo	II+	Length	139¹⁹	24	305±2 (86)	166	7		
					Weight	29 (30)	24	260±7 (86)	231	19		
				III+	Length	139	36	362±5 (41)	223	6		
					Weight	29 (30)	36	451±34 (41)	422	12		
		IV+	Length	139	48	415±22 (4)	276	6				
			Weight	29 (30)	48	894±162 (4)	865	18				
		Sourd- nahunk	1999	Embden	I+	Length	143	12	260±12 (65)	117	10	
						Weight	32	12	161±5 (65)	129	11	
	1998				Embden	I+	Length	163±2 (120)	12	259±2 (68)	96	8
							Weight	45 (120)	12	139±4 (55)	94	8
	1997		Embden	II+	Length	163±2 (120)	24	303±7 (18)	140	6		
					Weight	45 (120)	24	288±23 (18)	243	10		
				I+	Length	174±3 (60)	12	254±2 (55)	80	7		
					Weight	54±3 (60)	12	137±4 (54)	83	7		
	III+	Length	174±3 (60)	24	310±3 (24)	136	6					
		Weight	54±3 (60)	24	259±12 (18)	205	9					

¹⁹Bolded numbers represent estimated sizes determined from "Hatchery fish mean total length and number per weight, brook trout and rainbow trout", prepared by Owen Fenderson, May 30, 1975.

Table 24. Growth increments (mm) of brook trout stocked at study ponds by water, genetic group, and age. Sample size in parentheses (con't).

Water	Genetic group	Year stocked	Rearing station	Age when sampled	Size variable	Mean size when stocked	Months post stocking	Mean size when sampled	Growth increment			
									Total	Per month		
Kimball P (con't)	Sourd- nahunk	1997	Embden	III+	Length	174±3 (60)	36	345±6 (3)	171	5		
					Weight	54±3 (60)	36	423±16 (3)	369	10		
		1996	Enfield	II+	Length	133 (30)	24	293±1 (83)	160	7		
					Weight	18 (30)	24	224±5	206	9		
				III+	Length	133 (30)	36	351±4 (20)	218	6		
					Weight	18 (30)	36	378±38 (7)	360	10		
				IV+	Length	133 (30)	48	350±10 (2)	217	5		
					Weight	18 (30)	48	432±33 (2)	414	9		
		Mcintire P	Kenne- bago	2000	Embden	I+	Length	217	6	279±3 (40)	62	10
							Weight	104	6	244±7 (40)	140	23
1999	Embden			I+	Length	187 (90)	6	249±5 (18)	62	10		
					Weight	65 (90)	6	190±11 (18)	125	21		
				II+	Length	187 (90)	18	356±5 (13)	169	9		
					Weight	65 (90)	18	505±22 (13)	440	24		
1998	Embden			I+	Length	191±3 (30)	6	251±2 (35)	60	10		
					Weight	76	6	159±5	83	14		
				II+	Length	191±3 (30)	18	341±12 (5)	150	8		
					Weight	76	18	395±50 (5)	319	18		

Table 24. Growth increments (mm) of brook trout stocked at study ponds by water, genetic group, and age. Sample size in parentheses (con't).

Water	Genetic group	Year stocked	Rearing station	Age when sampled	Size variable	Mean size when stocked	Months post stocking	Mean size when sampled	Growth increment	
									Total	Per month
McIntire P (con't)	Kennebago	1998	Embden	III+	Length	191±3 (30)	30	420±19 (2)	229	8
					Weight	76	30	753±43 (2)	677	23
	Sourd-nahunk	2000	Embden	I+	Length	195	6	273±3 (55)	78	13
					Weight	81	6	239±8 (55)	158	26
		1999	Embden	I+	Length	203 (60)	6	250±3 (45)	47	8
					Weight	82 (60)	6	194±8 (45)	112	19
			Embden	II+	Length	203 (60)	18	343±4 (10)	140	8
					Weight	82 (60)	18	452±21 (10)	370	21
		1998	Embden	I+	Length	208±3 (60)	6	261±2 (50)	53	9
					Weight	99	6	172±4 (50)	73	12
			Embden	II+	Length	208±3 (60)	18	329±3 (8)	121	7
					Weight	99	18	379±18 (8)	280	16
				III+	Length	208±3 (60)	30	378±7 (3)	170	3
					Weight	99	30	625±32 (3)	526	18
Monroe P (West)	Kennebago	1997	Embden	I+	Length	149±2 (60)	12	261±4 (42)	112	9
					Weight	31 (60)	12	149±7 (42)	118	10
	Sourd-nahunk	1997	Embden	I+	Length	174±3 (60)	12	242±2 (24)	68	6
					Weight	54±3 (60)	12	110±3 (24)	56	5

Table 25. Summary of brook trout incremental growth for all waters by genetic group, rearing station, and age. Sample size in parentheses.

Genetic group	Rearing station	Brood year	Stocking	Size variable	Mean size when stocked	Size at months post stocking													
						6	12	18	24	30	36	42	48	54	60				
Kennebago	Palermo	1995	FF	Length	139														
				Increment			258±10 (13)	306±2 (87)	362±8 (19)	415±22 (4)									
				Weight	29 (30)	180±21 (13)	261±8 (87)	451±34 (18)	894±162 (4)										
				Increment		151	81	190	443										
				Embden	1996	FF	Length	149±2 (60)	257±2 (102)	323±3 (43)	369±19 (5)								
							Increment		108	66	46								
	Weight	31 (60)	144±4 (101)				313±10 (43)	603±145 (4)											
	Increment		113				169	290											
	SY						Length	191±3 (30)	251±2 (35)	341±12 (5)									
							Increment		60	90									
				Weight	76²⁰	159±5 (35)	395±50 (5)												
				Increment		83	236												
	1997	FF	Length	157±2 (120)	268±1 (121)	328±3 (30)													
			Increment		111	60													
			Weight	37 (120)	161±3 (121)	363±12 (29)													
			Increment		124	202													

²⁰ Estimated (see previous footnote).

Table 25. Summary of brook trout incremental growth for all waters by genetic group, rearing station, and age. Sample size in parentheses (con't).

Genetic group	Rearing station	Brood year	Stocking age	Size variable	Mean size when stocked	Size at months post stocking										
						6	12	18	24	30	36	42	48	54	60	
Kennebago	Embden	1997	SY	Length	187	249±5										
					(90)	(18)										
				Increment		62										
		Weight	65	190±11												
			(90)	(18)												
		Increment		125												
		1998	FF	Length	150		268±4									
						(55)										
	Increment					118										
			SY	Length	217	273±2										
				(159)												
	Increment			56												
		FF	Length	104	207±3											
			(159)													
Increment			103													
All	All		FF	Length	151		262		313		362±5					
					(210)	(251)	(179)	(41)								
				Increment		109	60	54								
				Weight	34	154	276	451±34								
	(210)	(250)	(179)	(41)												
Increment		119	136	167												

Table 25. Summary of brook trout incremental growth for all waters by genetic group, rearing station, and age. Sample size in parentheses (con't).

Genetic group	Rearing station	Brood year	Stocking age	Size variable	Mean size when stocked	Size at months post stocking										
						6	12	18	24	30	36	42	48	54	60	
Kennebago	All	All	SY	Length	188 (120)	250 (53)	341 (5)									
				Increment		61	89									
				Weight	68 (120)	170 (53)	395 (5)									
				Increment		104	287									
Sourd-nahunk	Enfield	1995	FF	Length	133 (30)		214±9 (12)		293±1 (88)		333±12 (8)		350±10 (2)			
				Increment			81		79		40		17			
				Weight	18 (30)		104±21 (11)		224±4 (85)		349±44 (8)		433±33 (2)			
				Increment			86		120		125		84			
	Embden	1996	FF	Length	174±3 (60)		248±2 (83)		310±3 (24)		363±18 (4)					
				Increment			74		56		53					
				Weight	54±3 (60)		126±4 (82)		306±4 (19)		478±55 (4)					
				Increment			72		252		172					
			SY	Length	208±3 (60)	261±2 (50)		329±3 (8)								
				Increment		53		68								
				Weight	99	172±4 (50)		379±18 (8)								
				Increment		73		134								

Table 25. Summary of brook trout incremental growth for all waters by genetic group, rearing station, and age. Sample size in parentheses (con't).

Genetic group	Rearing station	Brood year	Stocking	Size variable	Mean size when stocked	Size at months post stocking																
						6	12	18	24	30	36	42	48	54	60							
Sourd-nahunk	Embden	1997	FF	Length	163±2 (120)																	
				Increment			259±2 (70)		303±7 (18)													
				Weight	45 (120)		143±5 (70)		288±23 (18)													
			Increment			96		44														
			SY	Length	203 (60)		250±3 (45)															
				Increment			47															
		Weight		82 (60)		194±8 (45)																
		1998	FF	Length	143		266±3 (68)															
				Increment			123															
				Weight	32		214±9 (68)															
			Increment			182																
			SY	Length	195		266±2 (120)															
Increment					71																	
Weight	81			197±6 (120)																		
Increment			116																			

Table 25. Summary of brook trout incremental growth for all waters by genetic group, rearing station, and age. Sample size in parentheses (con't).

Genetic group	Rearing station	Brood year	Stocking age	Size variable	Mean size when stocked	Size at months post stocking									
						6	12	18	24	30	36	42	48	54	60
Sourd-nahunk	All	All	FF	Length	162 (210)	254 (202)	297 (112)	351±4 (20)							
				Increment		98	50	70							
				Weight	44 (210)	134 (187)	230 (103)	378±38 (7)							
				Increment		96	110	154							
			SY	Length	206 (120)	256 (95)	329±3 (8)								
				Increment		50	71								
				Weight	91 (120)	182 (95)	379±18 (8)								
				Increment		92	115								

Table 26. Relative trapnet capture rates of Kennebago, Sourdnahunk, and domestic (Maine Hatchery and F₁ strains) hatchery-reared brook trout.

Waters sampled	Reg. sev.	Compe- tition category	Age at stocking ²¹	Age at sampling	Genetic group	Number stocked	Captured					
							Number	Percent				
Kimball	High	Low	FF	I+	Kennebago	5,600	328	5.9				
					Sourdnahunk	5,600	188	3.4				
					Both	11,200	516	4.6				
				II+	Kennebago	4,200	114	2.7				
					Sourdnahunk	4,200	106	2.5				
					Both	8,400	220	2.6				
				III+	Kennebago	2,800	46	1.6				
					Sourdnahunk	2,800	23	0.8				
					Both	5,600	69	1.2				
				IV+	Kennebago	1,400	4	0.3				
					Sourdnahunk	1,400	2	0.1				
					Both	2,800	6	0.2				
McIntire	High	Low	SY	I+	Kennebago	600	93	15.5				
					Sourdnahunk	600	150	25.0				
					Both	1,200	243	20.3				
				II+	Kennebago	400	18	4.5				
					Sourdnahunk	400	36	9.0				
					Both	800	54	6.8				
				III+	Kennebago	200	2	1.0				
					Sourdnahunk	200	3	1.5				
					Both	400	5	1.3				
				Jaybird	Mod.	Mod	FF	I+	Kennebago	1,050	5	0.5
									Sourdnahunk	1,050	8	0.8
									Both	2,100	13	0.6
II+	Kennebago	700	1					0.1				
	Sourdnahunk	700	0					0				
	Both	1,400	1					0.1				
III+	Kennebago	350	0					0				
	Sourdnahunk	350	1					0.3				
	Both	700	1					0.1				
Broken Bridge	High	High	FF					I+	Kennebago	1,200	0	0
									Sourdnahunk	1,200	0	0
									Both	2,400	0	0
				II+	Kennebago	800	0	0				
					Sourdnahunk	800	0	0				
					Both	1,600	0	0				
				III+	Kennebago	400	1	0.3				
					Sourdnahunk	400	0	0				
					Both	800	1	0.1				
				Egypt	Mod.	Severe	FF	I+	Kennebago	6,200	4	<0.1
									Sourdnahunk	6,200	8	0.1
									Both	12,400	12	0.1

²¹ FF = fall fingerling (6 months old); SY = spring yearling (1 year old)

Table 26. Relative trapnet capture rates of Kennebago, Sourdnahunk, and domestic (Maine Hatchery and F₁ strains) hatchery-reared brook trout (con't).

Waters sampled	Reg. sev.	Compe- tition category	Age at stocking ²²	Age at sampling	Genetic group	Number stocked	Captured		
							Number	Percent	
Egypt (con't)	Mod.	Severe	SY	I+	Kennebago	2,200	16	0.7	
					Sourdnahunk	2,200	13	0.6	
					Both	4,400	29	0.7	
				FF	II+	Kennebago	6,200	3	<0.1
						Sourdnahunk	6,200	2	<0.1
						Both	12,400	5	<0.1
			FF	III+	Kennebago	4,400	0	0	
					Sourdnahunk	4,400	0	0	
					Both	8,800	0	0	
			FF	IV+	Kennebago	2,200	0	0	
					Sourdnahunk	2,200	0	0	
					Both	4,400	0	0	
Pike Brook Ponds (East and West); Pineo Pond ²³	Low	Low	FF	I+	Domestic	5,500	355	6.4	
					Domestic	5,500	16	0.3	

²² FF = fall fingerling (6 months old); SY = spring yearling (1 year old)

²³ Data collected 1988-90.

Table 27. Relative abundance of brook trout and competing species captured during post-season in study waters.

Competition	Water	Year	Fish caught		Competing species									Percent brook trout					
			BKT		WHS	MIN	SLT	PKS	SKB	BUL	PKL	SMB	EEL		All				
Low	McIntire P	1998	No	96			590								686	14			
			Lb	41			68								109	38			
		1999	No	169			644								813	21			
			Lb	95			161								256	37			
		2000	No	207			92								299	69			
Lb	85				11								96	89					
		Mean	No	157		442							599	26					
			Lb	74		80							154	48					

Moderate	Jaybird P	1997	No	23			13								2791	3	2830	1.8	
			Lb	3			<1								123	8	134	2	
		1998	No	20		2	4		4						1672		1702	1	
			Mean	No	22		9		2		2232		2		2266	1			

High	Broken Bridge P	1997	No	3			11		243					1181	8	3	1449	<1	
			Lb	<1			<1		5					114	3	5	127	<1	

Severe	Egypt P	1998	No	4	114	7	10	19						1036		2	1192	<1	
			Lb	2.41	69.26	.	.	.						126.89		.	199	1	
		1999	No	11	190	195	342	951							2220		2	3911	<1
			Lb	3.96	139.78	20 ²⁴	37.67	23.25							82.15		.	307	1
				Mean	No	8	152	101	176	485					1628		2	2552	<1
			Lb	3.19	104.52	10	19.39	11.86					104.52		.	253	1		

²⁴Estimated.

Table 28. Population estimates of competing fish species, brook trout study ponds.

Year	Species	Water	Population estimate	Per acre	
				No.	Weight (lb)
1997	Bullhead	Broken Bridge P	4,733 (3,759-6,389)	237	.
		Jaybird P	13,354 (11,369-16,178)	954	.
1999	Creek chub	McIntire P	1,131 (947-1,405)	57	14.3
2000	Creek chub	McIntire P	276 (241-325)	14	1.6

Appendix 1. Percent eye-up of eggs from Phillips Hatchery brook trout brood, 1976-99.

Year	Genetic group					
	MHS	Maine Hatchery/ Assinica	Assinica/ Tomah	Assinica	Kennebago	Sourdnahunk
1976	86					
1977	65					
1978	42					
1979	65	73				
1980	62	80				
1981	74	79				
1982	82	89				
1983	86	89				
1984	78	76	59			
1985	76	36	52			
1986	85		34			
1987	75	46	24			
1988	42	22	14			
1989	26	38	14			
1990	63		60			
1991	27	36				
1992		60				
1993		45				
1994	20	34				
1995	24			48	76	80
1996	37			41	92	91
1997	27			57	77	75
1998	49				82	60 ²⁵
1999 ²⁶					63	63
2000					60	56

²⁵Future brood lot 89% eye-up; Production lot 31% eye-up; mean = 60%.

²⁶1999 was the first year of using hatchery broodstock to make future brood.

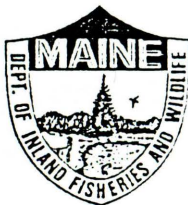
Appendix 2. Ratings of fish species as brook trout competitors.

Species	Species code	Rating	Category
Stickleback species	SKB	1	Low
Slimy sculpin	SCL	1	
Finescale dace	FSD	2	
Blacknose dace	BND	2	
Northern redbelly dace	NRD	2	
Blacknose shiner	BNS	3	
Pearl dace	PRD	3	
Common shiner	CMS	3	
Fathead minnow	FHM	4	Moderate
Banded killifish	BKF	4	
Lake whitefish	LWF	4	
Burbot	CSK	4	
Lake trout	LKT	4	
Golden shiner	GLS	5	
Lake chub	LCB	5	
American eel	EEL	6	
Rainbow smelt	SLT	6	
Longnose sucker	LNS	6	
Pumpkinseed sunfish	PKS	6	
Creek chub	CCB	7	
Largemouth bass	LMB	9	Severe
White sucker	WHS	9	
Brown bullhead	BUL	9	
Chain Pickerel	PKL	10	

COOPERATIVE STATE FEDERAL PROJECT

This report has been funded in part by the Federal Aid in Sport Fish Restoration Program. This is a cooperative effort involving federal and state government agencies. The program is designed to increase sport fishing and boating opportunities through the wise investment of anglers' and boaters' tax dollars in state sport fishery projects. This program which was funded in 1950 was named the Dingell-Johnson Act in recognition of the congressmen who spearheaded this effort. In 1984 this act was amended through the Wallop-Breaux Amendment (also named for the congressional sponsors) and provided a threefold increase in Federal monies for sportfish restoration, aquatic education and motorboat access.

The Program is an outstanding example of a "user pays-user benefits", or "user fee" program. In this case, anglers and boaters are the users. Briefly, anglers and boaters are responsible for payment of fishing tackle excise taxes, motorboat fuel taxes, and import duties on tackle and boats. These monies are collected by the sport fishing industry, deposited in the Department of Treasury, and are allocated the year following collection to state fishery agencies for sport fisheries and boating access projects. Generally, each project must be evaluated and approved by the U.S. Fish and Wildlife Service (USFWS). The benefits provided by these projects to users complete the cycle between "user pays — user benefits".



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