

ACEC PROGRAM FOR THE PETAPAWAG DESIGNATION



PREPARED FOR THE GREAT POND ADVISORY COMMITTEE WILLIAM STRICKLAND CHAIRMAN BY CYNTHIA AND LAWRENCE SWEZEY NOVEMBER 2009



Introduction

Martins Pond is located smack in the middle of Groton.

In December, 2002 Robert Durand from the State Executive Office of Environmental Affairs designated two new areas of Critical Environmental Concern; the Squannassit and Petapawag Areas of Critical Environmental Concern (ACEC). Located within the Petapawag ACEC is Martins Pond and Martins Pond Brook. This report is a draft Resource Management Plan for Martins Pond. All lake front owners have reviewed Resource Management plan draft through personal contact or via the web site. The Groton Conservation Commission and Great Pond Advisory Committee have reviewed the draft.

Lake Identification

Martins Pond is located in Middlesex County, Groton; a small but growing town northwest of Boston. This pond lies cradled between the Chestnut hills and Gibbet hill.

The open water acreage has shrunk down to 19 acres. This ancient depression was formed as a remnant of the scouring ice, ten thousand years ago. Martins Pond Brook is the only outlet headed for the Merrimac River in a long and round about system. Appendix 1b, c will give you an idea of the watershed. The mouth of Martins Pond Brook is usually plugged with beaver wood. Limited flow and low wave action during the summer and winter months contributes to the low oxygen. Due to the low oxygen content during winter months fish kills have been seen on two occasions. This stagnant condition and limited wave action over the years has made the pond very shallow with a large border bog on the west side.

In 1897 Lawrence Brooks an attorney, acquired from former Governor George Boutwell and others, title to all of the land surrounding Martin's Pond. He had orchards and a dairy barn and built himself a brick home over looking the pond. Originally the outlet to Martins Pond was located at the corner of Martins Pond and Blossom Lane. This area was known as (the Causeway). The Brooks Farm road sliced the wooded marsh (Hog Swamp) on the Northwest side of the road. Swamp waters still seep under the road from the Merrimac watershed to the Nashua seesawing during spring floods Man made canals criss-cross the swamplands in this area. Cattle from the Potter Dairy Barn on Blossom Lane were fenced in this swampy area. Ice was harvested from Martins Pond to fill the icehouses. Mr. Martin and oxen were said to have fallen through the ice during a winter cutting. The result of this tragedy led to the naming of "Martin's Pond".

Charles Dix Fletcher bought the Brooks Estate in 1937. He ran the fruit orchards and logged the woods for his sawmill. He later gave the property to his daughter Evelyn Priest. Richard Priest received the 500 acres from his mother in 1944, after coming home from the Pacific Front in WW II.

One of father's first projects was to get rid of a pack of wild dogs that took over the apple farm property. At about this time he was told that special legislation exempted Martins Pond from the Commonwealths laws of Great Ponds. He assumed that he owned the pond privately. It was later learned that neither Governor Boutwell nor Senator Saltenstall passed legislation to exempt Martins Pond as a private pond. Martins Pond is a Great Pond.

Private landowners would allow fishing access to those who asked to enter private property.

Martins Pond has a very silty bottom row- boat oars could be pushed up to the handle in most places (much to the mischievous delight of older sisters) and disappear totally from view. Data gathered from the Massachusetts Fish and Game in Acton tells us that 4 to 5 feet is the deepest depth in Martins Pond.

Inventory of Physical Conditions

Martins Pond

The whole western shoreline of Martins Pond is a New England level border bog. A marsh is located around the outer edge. Then the freshwater marsh changes into a bog transition zone from white oak and red maple to black spruce and larch to leather leaf, sedges and spongy sphagnum. There are at least four species of sphagnum moss in the interior of the bog. This area is best explored during the frozen winter months. The bright red sphagnum carpets the ground. Many odd and interesting plants are listed in the end of the plant species on the plant chart. On the east side of the pond, one house lot has been proposed. This upland area has a old gravel cut, about 200 feet from the shoreline. Mixed hardwood and pine grow along with marsh growing in the lower hollows. The slope changes along the uplands gradually rising up. Along the shore beavers have been dropping trees. These deadfalls have created homes for mammals and a perch for snakes and water birds. In the most southern corner of the pond is the outlet and here Martins Pond Brook start's its way to Lost Lake.

Mud islands of white lily roots provide basking and resting areas for turtles and ducks. Martins Pond Road circles the southwest edge of the pond; all of the run-off inters the wetland at this point.

Structures and Human Use Inventory

About 60 % of the shoreline length of Martin's pond is thick marshy growth. The sediment in the littoral zone is silt, and mucky peat moss. This sediment creates extensive shallow areas, good for wading birds but determines the ponds carrying capacity at a very low potential for recreational use. In order to protect this resource a very limited recreational use would be the best plan. Row-boats, canoes, kayaking or any non-motorized boats would be considered appropriate for this small pond. At this time there are no public access sites, or public swimming beaches. Private landowners would only allow fishing access abutting the pond. There are only a few private wells on adjacent properties to Martins Pond and Brook. Most homes in the area are on town water. There are no water level controls or dams.

There are no structures located in or on the water. There is only one home within 200 feet of the pond.

Run off from the hills influences the wetland with sediment. The salt from sanding Martins Pond Road in the winter also runs into the pond. Sedimentation that washes into the wetlands from the road and uphill contributes to water quality problems.

Rare Species and Wildlife Inventory

There are no recorded species that have been discovered that would be considered endangered (E) threatened (T) or of special concern (SC) by the Natural Heritage and Endangered Species program.

However rare species have been seen within the watershed of Martins Pond. Nesting Wood turtles (SC), Spotted Turtles (SC), Blanding Turtles (T) have also been observed trekking the swamplands. On one "great night" congregating Mole Salamanders, Blue Spotted Salamanders (SC) and Jefferson Complex (SC) have been observed. In verifying updated rare species data with the Natural Heritage maps, I found no marked areas for animals or plants on the watershed of Martins Pond. The area does show that the wetlands connect core habitats and that this large area contributes to priority functional ecosystems.

Beaver have been very active over the decades. Many trees and shrubs have been chewed and girdled around the edge of Martins Pond. Two large lodges have been built (see Groton property map appendix 1d for locations. Otters, muskrats, fishers, fox, porcupines, raccoons, and mink have all been sighted. All the animals you would normally see around wooded forests and wet swamps including herds of deer, turkeys, and bobcats would be inventoried for Martins Pond.

The warm waters support a variety of fish. Bullheads, Pumpkin seeds, Bluegills and Chain Pickerel, all add to the thrill of a fishing expedition. Ice fishing is still a popular sport with locals. Please use appendix 3a to learn more.

Hunting for baby painted turtles became a favorite sport to me and other patient friends. We would row along the waters edge peeking under lily pads catching hatchlings. The turtles were groomed of bloodsuckers and fingernail clams allowed to clamber around the pram bottom and then were released in the proper spot.

Black water snakes were legendary critters reaching record lengths. Ernest Carkin wrote a story about them, in a three part series, on the Brooks Estate in The Groton Herald. Bird life is well fed by the flower nectar in the spring and berried shrubs in the fall. Redwing Blackbirds made use of the stands of cattails. Green heron, Blue heron, Wood ducks, mallards all live in the marshy areas around the pond. Migrating Canada geese, Swans, and Mergansers would stop over to rest and eat on Martins Pond, winging their way north or south depending on the season. (Please see appendix 3b for charts on amphibians and reptiles) In the future a local birder would like to participate in the bird and insect inventory for Martin's Pond.

Submerged/Emergent plant inventory

Plants offer food, shelter, stabilization and nesting materials. A diversity of aquatic plants is an indispensable part of a ponds ecosystem. It would be important to inventory plants for sustainability for a variety of wildlife.

There are no lake/pond committees that have taken any action on Martins Pond. There have been no management techniques for invasive plants on Martins Pond. Martins Pond has been isolated due to the surrounding private property and the inaccessibility of the shoreline. Martins Pond is also isolated from intensive recreation use. There are only two exotic invasive plants in the pond; Phragmites australis and Lythrum salicaria. The species of plant that has taken hold and covers 60% of the open surface in the summer is Nymphaea odorata, the white water lily.

Monitoring the pond at four stations next summer (2010) will get ahead of any more exotic invasive species of plant.

Future monitoring and action for the pond is in the planning stage.

List of Submerged and Emergent Plants in Martins Pond. Plant Taxa were classified as RARE= small populations, INFREQUENT= low numbers, and FREQUENT=Larger numbers abundant in most communities.

SCIENTIFIC NAME	COMMON NAME	ABBREV	FREQ
Acer rubrum	Swamp maple	Ar	F
Alnus spp.	Alder	Al	Ι
Asclepias incarnata	Swamp milkweed	Ai	R
Aster puncata	Swamp aster	Ар	F
Brassenia schreberi	Water shield	Bs	F
Celphalanthus occidentalis	Buttonbush	Со	Ι
Ceratophyllum dermersum	Coontail	Cd	F
Chamaedaphe calyculata	Leatherleaf	Cc	F
Cladium mariscoides	Twig rush	Cm	Ι
Clethra alnifolia	Sweet pepperbush	Ca	Ι
Cyperus spp.		С	Ι
Decodon verticillatus	Waterwillow	Dv	F
Eleocharis acicularis	Needle spike rush	Ea	F
Eleocharis robbinsii	Robbins spike rush	Er	F
Hypericum boreale	St.John`s wort	Hb	Ι
Ilex verticillata	Winterberry	Iv	Ι
Impatiens capensis	Jewelweed	Ic	F
Iris pseudacorus	Yellow Iris	Ір	Ι
Isoetes spp.	Quillwort	Ι	R
Lemna minor	Duckweed	Lm	F
Ludwigia palustris	Water Perslane	Lp	Ι
Lythrum salicaria	Purple Loostrife	Ls	F
Myrica gale	Sweetgale	Mg	F
Myriophyllum heterophyllum	Variable Milfoil <mark>NO</mark>	Mh	F
Nuphar varigata	Bull lily	Nv	F
Nymphaea odorata	White lily	No	F
Nymphaea odorata var. odorata	Bigger white lily	Noo	F
Osmunda regalis	Royal fern	Or	Fs
Polygonum hydropiperoides	Smartweed	Ру	Ι

Polygonum spp.	Smartweed	Pspp.	Ι
Pontederia cordata	Pickerelweed	Pc	Ι
Peltandra virginica	Water Arum	Wa	F
Potamogeton amplifolius	Big Leaf pondweed	Pa	Ι
Potamogeton crispus	Curly pondweed	Pc	Ι
Potamogeton gramineus	Variable pondweed	Pg	F
Potamogeton robbinsii	Robbins pondweed	Pr	F
Rosa palustris	Swamp Rose	Rp	F
Sagittaria latfolia	Arrowhead	S	Ι
Salix spp.	Willow	Sw	Ι
Sparganium spp.	Bur-reed	Sp	Ι
Toxicodendron vernix	Poison Sumac	Tv	F
Typha latifolia	Cattail	Ti	F
Utricularia intermedia	Flatleaf Bladderwort	Ui	F
Utricularia purpurea	Purple Bladderwort	Up	F
Utricularia spp.	Bladderwort	U	Ι
Vaccinium corymbosum	Blueberry	Vc	F
Vallisneria americania	Wild celery	Va	R
Wolffia columbiana	Water meal	W	F
Bog Plants			
Andromedia glaucophylla	Bog Rosemary	Ag	Ι
Carex stricta	Tussock Sedge	Cs	F
Pogonia ophioglosspides	Rose pogonia	Rp	R
Drosera rotundifolia	Round leaf Sundew	Dr	R
Eriophorum virginicum	Tawny Cotton Grass	Ev	R
Kalmia angustifolia	SheepLaurel		Ι
Larix laricina	Larch		R
Picea mariana	Black Spruce		R
Sarracenia purpurea	Pitcher Plant		Ι

	Algae		
Phylum Cyanophyta	Blue-green Algae	AB	
Anabaena	Filamentous Blue		

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Structured forms of Algae			
Chara	Muskgrass		
Nitella	Stonewort		

ACTION PLAN

Water quality must be protected from stormwater, soil erosion and nonpoint source pollution. Everyone should travel to Australia (after a six year drought) and see how important water is to that country. Make a list of realistic objectives and activities that can be accomplished within the watershed.

One new house lot, having lake-frontage on Martins Pond has been proposed by the Groton Land Foundation. The Groton Conservation commission would have to identify this area as sensitive enough to propose strict performance standards. It will be up to the D.E.P. and members of the Conservation Commission to make conditions sensitive enough to protect from runoff, heavy forest cutting and allowing no structures in the water. Vegetation in the buffer zone around the pond holds sediment, regulates water temperature and enhances habitat. Most of the shore line is not accessible due to bank structure, wet land vegetation and wetland soils. A project for future dock structures on Martins Pond should file a Notice of Intent under the Massachusetts Wetland Protection Act, M.G.L., c 131, sect. 40 and Chapter 91.

Monitoring the pond twice a year will help form base data. In the summer of 2010 all pond stations (check maps) on Martins Pond will be monitored for exotic invasive plant species and algae blooms. Water clarity will be tested with multiple Secchi disk drops. A dissolved oxygen monitor has been purchased. Volunteers will be organized to help collect data. A report will be written and sent into the Groton Con. Comm.; before the end of the year. Monitoring the pond will provide knowledge for management and information to help solve problems. A measurable objective with the data could be to decrease erosion, reduce sediment, and prevent exotic invasive species. Vernal pools surrounding the pond need to be certified. This could take place in the early spring. Update drains with a better filtering system or send water to settling basin before entering culvert. The outfalls should be riprapped with stone to prevent erosion of wetlands. In the spring someone needs to talk to highway manager and Groton Conservation Commission.

Start program to certify Advisory Committee members in the Standard Operating Procedure of Hand Pulling Exotic Invasive Vegetation. This program was prepared by Michelle Robinson and Jim Straub DCR, of the Department of Conservation and Recreation. Date: May 15 2003.

The last action plan would be for a member of the Advisory Team to go to the ACEC Stewardship Meetings.



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- 5. <u>Ecology of Inland Waters and Estuaries</u> by George K. Reid Copyright 1961 Van Nostrand Reinhold Company.
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- 9. Groton Conservation Commission information on Natural Heritage Rare Species Maps, Barbara Ganem, Tom Orcutt, Groton Water Department Supervisor
- 10. Natural Heritage Endangered Species Program NHESP.ORG

Appendix

- 1a. Picture of House
- 1b. Topo Map
- **1c. Martins Pond Watershed Map**
- 1d. Land use and Habitat Shoreline Map
- 1e. Google Earth Martins Pond Map
- 2a. Human Use Chart
- **2b. Human use Chart Future**
- 3a. Fish
- **3b.** Amphibians, Reptiles
- 4a. Historic Letter; Preliminary Summary Martins Pond Findings
- 5a. East Side of Martins Pond











etivity	Level	Trend	Comments:
loating (power)	0		NO public access
loating (Row)	100		
oating (kayaking)	low		
oating (canoe)	low		
loating (sail)	0		
et-skiing	0		
Vaterskiing, et. al.	0		
wimming	0		
ishing (boat / ecreational)	Low	Decressig	
ishing (boat / ournament)	0		- Landerson
ishing (Shore)	Low	Decreasing	
shing (Ice)	Low	Petrasy	
iving / Snorkeling	0		
nowmobiling	LOW		
-wheeling on ice	0		
e-skating	med		

Level: 0 = None/Negligible, Low, Med, High Trend: Increasing, Decreasing, "-" = Flat

			Martins Po	o. bn
			Appendix	2
Activity Inventor	y (anecdotal	observation)	Human use Fut	ure
Activity	Level	Trend C	omments:	Carlo Carlo
Boating (power)			Mastins and is 19	GCReal
Boating (Row)	High		There are Many Muy	1 ISLA
Boating (kayaking)	High		that Limit Sur face	area).
Boating (canoe)	High		Marsh Limits She	reline
Boating (sail)	how		accessablity NO P	ublic
Jet-skiing	0		access. d Maxim	2400
			depen of water a	1
			• •	_
Waterskiing, et. al.	0			
Swimming	Low			
Fishing (boat / recreational)	Med			
Fishing (boat / tournament)	Low			
Fishing (Shore)	Med			
Fishing (Ice)	Med			
Diving / Snorkeling	0			
Snowmobiling	8			
4-wheeling on ice	0			
Ice-skating	med			
Structures on	0	NO		

Level: 0 = None/Negligible, Low, Med, High Trend: Increasing, Decreasing, "-" = Flat In general, specific information on each fish for Knops Pond/Lost Lake is most complete and referenced. The presence of the Golden Shiner is more than likely through introduction as a bait fish, though, it is a species native to this region. White catfish, Largemouth Bass, and Bluegills are both introductions to the Northeast from elsewhere in the United States.

Trout (**) are periodically stocked into Knops/Lost Lake and Baddacook

LARGEMOUTH BASS NO	Micropterus salmoides (Lacepede, 1802)
BLUEGILL	Lepomis macrochirus Rafinesque, 1819
PUMPKINSEED	Lepomis gibbosus (Linnaeus, 1758)
YELLOW PERCH	Perca flavescens (Mitchill, 1814)
SWAMP DARTER No	Etheostoma fusiforme (Girard, 1854)
WHITE CATFISH NO	Ameiurus catus (Linnaeus, 1758)
BROWN BULLHEAD	Ameiurus nebulosus (Lesueur, 1819)
GOLDEN SHINER	Notemigonus crysoleucas (Mitchill, 1814)
CHAIN PICKEREL	Esox niger Lesueur, 1818
AMERICAN EEL	Anguilla rostrata (Lesueur, 1817)
RAINBOW TROUT NO	Oncorhynchus mykiss (Walbaum, 1792)**
BROWN TROUT NO	Salmo trutta Linnaeus, 1758**



Yellow Perch (Perca flavescens)

- Description: Golden-yellow with 6-8 broad dark vertical bands.
- · Habitat: Schools found in quiet, warm, weedy waters.
- · Food: Small aquatic insects, crustaceans, and small fishes.



Bluegill (Lepomis macrochirus)

- · Also known as "kibbie" this fish is not native to NH.
- Description: Conspicuous dark blotches at the back of the large, square-shaped, blue-black flap behind the eye.
- · Habitat: Quiet, warm, weedy waters.



Eastern Chain Pickerel (Esox niger)

- Description: Slender, long. Large mouth with teeth. Dorsal and anal fin placed far back near the tail. Pattern of dark, chain-like markings on th side distinguishes it from other members of the pike family.
- · Habitat: Quiet, warm, shallow, weedy, mud-bottomed waters.
- Food: Carnivorous and eats golden shiners, brown bullheads, yellow perch and sunfish.



Pumpkinseed (Lepomis gibbosus)

- Description: Resembles the bluegill but has a bright oral spot at the tip of the ear flap and lack of dark spot on the s portion of the dorsal fin.
- Color: Breeding males are especially colorful w iridescent blue radiating lines on their cheeks and | covers.

Amphibians of Massachusetts (From Mass Atlas of Amphibians and Reptiles, Mass Audubon, in press) SC - Special Concern; T - Threatened; E - Endangered (Regions 1 through 6 numbered consecutively west to east)

SALAMANDER	s
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Common Name	Relative Abundance	Best season Found	Habitat	Region(s)
Mudpuppy No	Locally common	Year-round	Rivers, lakes	1, 2, 3
Spotted salamander	Widespread, fairly common	Early spring	Mixed forests, vernal pools	All regions
Jefferson salamander complex & blue- spotted complex	Locally common, SC	Early spring	Mixed forests, vernal pools	All regions
Marbled salamander 40	Very localized, T	Late summer, early fall	Mixed forests, vernal pools	2, 3, 4, 5
Red-spotted newt	Fairly common	Year-round	Mixed forest, permanent ponds	1, 2, 3, 4, 5 Cape & Vin.
Redback salamander	Abundant	Spring to autumn	Mixed woods	All regions
Dusky salamander	Common	Late spring to early fall	Swamps, streams	1, 2, 3, 4, 5
Two-lines salamander	Common	Late spring to early fall	Streams, brooks	All regions exc. islands
Four-toed salamander No	Localized, SC	Early spring to mid-summer	Mixed woods, sphagnum swamps, sedge marshes	1, 2, 3, 5, 6
Spring salamander MØ	Localized, SC	Late spring to late summer	Cold mountain brooks	1, 2, N part of 3

FROGS AND TOADS

Common Name		Relative Abundance	Best season Found	Habitat	Region(s)
Spadefoot toad	NO	Very local, T	Late spring to late summer	Sand plains, farmland	2, 5, 6
American toad		Common	Spring	Mixed woods, suburbs	1-5, lower Cape, not islands
Fowler's toad	ŅО	Common	Spring to early summer	Sand plains, woodlands	2, 3, 4, 5, 6
Gray treefrog		Common	Late spring	Mixed woods, small ponds, flooded meadows	All regions exc. Vineyard Nantucket
Spring peeper		Abundant	Spring	Mixed woods, wet meadows	All regions
Bullfrog		Common	Summer	Permanent ponds, lakes, larger rivers	All regions exc. islands
Green frog		Common	Summer	Most wetlands	All regions
Wood frog	Maria -	Common	Early spring	Mixed woods, vernal pools	All regions exc. islands
Leopard frog complex	NO	Localized	Spring	Wet meadows, fields	1, 2, 3, 4, 5
Pickerel frog		Common	Spring	Wet meadows, fields	All regions

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Common name	Rel abund	Notes	Habitat	Region(s)
Eastern & midland painted turtle	Common	best found April-November	Logs, stumps in any fresh water	All regions
Common snapping turtle	Common	bottom dweller	Cattail marshes, ponds	All regions
Stinkpot or musk turtle	Locally common	needs permanent water bodies	Shallow rivers & streams, backwaters	Spotty dist. all regions
Eastern box turtle	sc 110	declined from habitat loss	Woods with water source	C, SE Mass
Spotted turtle	SC	needs unpolluted shallow water	Sedge marshes, buttoabush ponds, shallow stump ponds, vernal pools	All regions
Wood turtle	SC	needa open sandy nesting areas	Clean trout brooks, shallow rivers with sandy/gravelly bottoms, bank undercuts	Exc. Cape
Blanding's turtle	Т	will wander overland	Shallow waters	Spotty dist.
Diamondback terrapin	T NO	prefers brackish water, tidewater streams	Estuaries, salt marshes	Coastal
Plymouth red- belly turtle	E No	. nests in disturbed sites	Ponds, shallow coves	Plymouth County
Bog turtle	EAO	frequents shallow waterways	Alkaline bogs, fens, shrub swamps	Region 1

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TURTLES (after Brian O. Butler, pers comm 1993, and DeGraaf & Rudia 1986)

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Preliminary Summary of Fond Survey Findings

Martins Pond, Groton

Martins Pond, area _____ acres, has maximum and average depths of 5 feet and 2 feet, respectively, and lies at an altitude of 317 feet. This is a natural, landlocked pond. Shoreline is about 80% wooded, 20% swampy. Bottom is almost entirely soft muck. Emergent and submerged vegetation is common consisting mostly of water lilies, sedge and cattails, and potomogetous and Elodea (Auacharis), respectively.

Chemical analysis on 8/21/52 was made in hazy weather with an air temperature of 78°F. Transparency was about 3 feet, the water being light green in color. Water temperature ranged down gradually from 77.4°F. one foot below the surface to 75.7° at a depth of 5 feet (just bottom). At 6 feet (within the bottom muck itself) the temperature was 74.0°F. All water temperatures with electric resistance thermometer. The water was well aerated, with 7.4 ppm. D. O. at 2 feet and 7.5 ppm. D. O. at 4 feet; pH was 6.9 and 7.0 at these latter depths, respectively.

Fish sampling operations resulted in the following catch of fish: 23 chain pickerel 3.0 to 13.9" long, weighing 5.2 pounds; 5 yellow perch 5.5 to 6.9" long weighing 0.4 pounds; 1 brown bullhead (horned pout) 7.2" long, weighing 0.1 pound; 55 pumpkinseeds (sunfish) 1.0 to 5.9" long, weighing 0.8 pounds; and 32 golden shiners 1.5 to 5.4" long, weighing 0.6 pounds.

Tentative recommendations would be to manage for chain pickerel and yellow perch. The best procedure would probably involve removing all fish now present by poisoning and restocking chain pickerel and yellow perch only. This pond appears less well suited to management for largemouth bass because of the shallow depth.

RHS/Lmw

Ri Ha

R. H. S. 9/11/52 Richard H. stroud Chief Aquatic Biologist

