MONTANA DEPARTMENT OF FISH, WILDLIFE AND PARKS

FISHERIES DIVISION
JOB PROGRESS REPORT

STATE: MONTANA PROJECT TITLE: STATEWIDE FISHERIES INVESTIGATIONS

PROJECT NO.: F-46-R-3 STUDY TITLE: SURVEY AND INVENTORY OF WARMWATER LAKES

JOB NO.: IV-a JOB TITLE: NORTHWEST MONTANA WARMWATER LAKES INVESTIGATIONS

PROJECT PERIOD: JULY 1, 1989 THROUGH JUNE 30, 1990

ABSTRACT

The Montana Department of Fish, Wildlife and Parks (DFWP) cooperated with Washington Water Power Company to document effects of drawdown on benthic organisms and fish in Noxon Rapids Reservoir (Huston 1990). Complete mortality of the adult largemouth bass (Micropterus salmoides) and partial loss of the smallmouth (Micropterus dolomieui) bass brood stock in the Miles City Hatchery led to the collection of replacement stock during the study period. Electrophoretic analysis from samples of largemouth bass collected for brood stock (Noxon Rapids Reservoir and Lee Metcalf Refuge ponds) showed no detectable genetic variation. An additional sample of largemouth from Ninepipe Reservoir also contained no genetic diversity. The Department and local clubs transplanted surplus largemouth bass to waters with poor recruitment. Habitat improvement structures were placed in six regional waters to benefit largemouth bass. An environmental assessment entitled, "Effects of Potential Introductions of Smallmouth Bass into Waters of the Clark Fork, Flathead, and Kootenai Drainages of western Montana" is in preparation. Champion International donated 4,000 acres of land containing 17 lakes and numerous recreational areas to the State of Montana. There is growing concern over the impacts of fishing tournaments on specific fish populations. Illegal introduction of exotic species continues to be a problem.

OBJECTIVES AND DEGREE OF ATTAINMENT

1. Establish and maintain fishable populations (catch rate = 0.25 fish/hour of smallmouth bass and burbot in Noxon and Cabinet Gorge reservoirs. Objectives partially accomplished and submitted in special segment report: Northwest Montana Coldwater Lakes Investigations, Noxon Rapids and Cabinet Gorge Reservoirs Segment, Project No. F-46-R-3 (Huston, 1990).

2. Identify populations with surplus fish that can be used for transplants. Objectives accomplished using state funding.

3. Attempt to acquire and develop access sites on all lakes and reservoirs with the potential for more than 500 mandays of fishing annually. First priority should be given to Lake Blaine and those lakes with adjoining Champion International or Plum Creek Timberlands property. Objectives were accomplished using state funding.

4. Minimize the impacts of land and water use on fisheries. Objectives were accomplished using state funding.

5. Define the impacts of fishermen use on specified fisheries and provide an increased opportunity to catch large bass (>12-14 inches) and northern pike (>28 inches). Objectives were accomplished using state funding.

6. Address the demand for new species introductions. Define the parameters of interspecific competition, participate in a walleye introduction EIS, halt the illegal spread of northern pike. Objectives were partially accomplished. Illegal northern pike introductions continue.

7. Enhance fish populations through the placement of artificial habitat. Objectives were accomplished using state funding.

8. Define the mechanisms of predator/prey relationships in area lakes. Reduce competition with game fish and reduce overabundant populations of nongamefish. Objectives were accomplished.

9. Encourage increased public knowledge and participation in resource decisions. Objectives were accomplished.

PROCEDURES

Standard floating and sinking monofilament gill nets 125-feet long by 6-feet deep were used for fish collection. Nets contained 25-foot panels of 3/4, 1, 1 1/2, 1 3/4, and 2-inch bar mesh. One-hundred foot by 6-foot beach seines were used primarily for juvenile fish collection. An 18-foot jon boat with boom mounted electrodes operating on a Coffelt VVP-IIC electrofishing box powered with 110 volt current was also used for sampling. We weighed and measured collected fish and extracted scales and stomach samples for future analysis. A list of waters with available species has been progressively compiled and updated (Appendix A).

Water quality and aquatic habitat were protected or enhanced by participation in the Lakeshore Protection Act (LPA), the Army Corps of Engineers (COE) 404 permit program, and Montana Pollution Discharge Elimination System (MPDES). Proposed projects were reviewed and mitigative measures recommended where appropriate.

Pre-spawning adult largemouth bass were collected from Lee Metcalf Refuge [U. S. Fish and Wildlife Service (USFWS)] ponds and both largemouth and smallmouth bass were collected from Noxon Rapids Reservoir to supplement hatchery brood stock. Fish were obtained either by hook and line or electrofishing and

transported by hatchery truck to the Miles City Hatchery. Samples from these largemouth bass populations and one other sample from Ninepipe Reservoir were analyzed electrophoretically to determine genetic composition.

A proposal for a Master of Science (M.S.) degree research project was drafted cooperatively by the U. S. Forest Service (USFS), DFWP, and the University of Montana to identify factors limiting largemouth bass production in Echo and Seeley lakes. Baseline data were collected to aid in the study design. Data included water temperature profiles and thermograph recordings, secchi disc readings, and largemouth bass spawning surveys.

A stratified creel census was conducted on Smith Lake during winter 1989-1990 to determine effort and success during the yellow perch ice fishery. Pressure estimates were derived from car counters and harvest estimated through angler interviews.

RESULTS AND DISCUSSION

Species Introductions

Several warmwater lakes in Region 1 have been identified as having a surplus of warmwater fish species available for transplant into other waters. Lakes with the greatest potential for procuring surplus largemouth bass are Rattlebone, Parker, Savage, and Carpenter lakes. In the past, largemouth bass transplants have been made to re-establish populations following a natural disaster or to introduce a predator fish species in a lake inhabited by an overabundance of prey species. In most instances, warmwater lakes are self-sustaining and do not require augmentation. In recent years we have made exceptions where "stunted" largemouth populations are transferred with assistance from local bass clubs to waters where recruitment is limited. As a club project, the Western Montana Bassmasters reconstructed a surplus 200 gallon fish tank for this sole purpose.

Overabundant yellow perch appear to limit bass recruitment in Murphy Lake. During August, 1989, bass were transferred from Rattlebone to Murphy Lake. Fifty largemouth bass averaging 8 inches in length and ranging from 6 to 11 inches were collected by hook and line. Prior to the transplant the USFS and the local bass club cooperated in placing brush shelters and whole tree cover in Murphy Lake to optimize habitat conditions that would aid in recruiting fish to older year classes.

During the winter of 1989-1990 all adult largemouth bass and a portion of the adult smallmouth bass brood stock were lost at the Miles City warmwater hatchery. Region One assisted in the collection of replacement brood stock. A northern latitude bass stock was desired for its ability to withstand harsh winter conditions. During April, 1990, a five-person crew captured by hook and line 343 pre-spawning largemouth bass ranging from 12-16 inches long from the Lee Metcalf Wildlife Refuge ponds near Stevensville, Montana. Fish were held overnight in live cars and trucked to Miles City the following day with only one fish lost.

Twenty-five smallmouth and 15 largemouth bass were additionally collected for the Miles City hatchery by hook and line and electrofishing from Noxon Rapids Reservoir. These bass ranged in size from 12-18 inches. Fifty largemouth bass were additionally sacrificed from each of the above waters for health examination and electrophoretic analysis. Length, weight, and stomach content evaluations were also conducted. Laboratory analysis revealed no bacterial or viral pathogens. Genetic analysis showed no genetic variation within the samples. This is probably a result of the populations being founded by a small number of fish and extensive inbreeding. Therefore these fish are probably not suitable for brood stock use. As a result of these findings, a sample of 50 largemouth bass was collected from Ninepipe Reservoir, a well-established fishery on the Confederated Salish and Kootenai Reservation near Pablo, Montana. These fish also contained no genetic variation. It is known that in past years largemouth from Ninepipe Reservoir were added to the Miles City brood stock. Largemouth bass genetic data from the three aforementioned lakes and from at least two additional lakes will be reported later by personnel from the Department and the University of Montana Population Genetics Laboratory. Additional populations will be tested for inclusion in the brood stock.

Western Montana contains several lakes and streams that presently support marginal trout fisheries. The introduction of smallmouth bass to enhance these fisheries is currently under review. During the project period a request for proposal was prepared and a contract awarded to Dr. David Bennett from the University of Idaho. The project will include a literature review and environmental assessment on the effects of potential introductions of smallmouth bass into waters of the Clark Fork, Flathead, and Kootenai drainages of western Montana. The final report is scheduled for completion by December, 1990. The project is jointly funded by DFWP, Lolo National Forest, and the Confederated Salish and Kootenai Tribe.

The region confirmed additional waters containing illegal introductions of exotic fish. Smallmouth bass were documented into Upper Thompson Lake, providing access for invasion into Middle and Lower Thompson lakes and the Thompson River. Yellow perch were documented in Rogers Lake, a designated brood lake for arctic grayling (Thymallus arcticus). It is likely that yellow perch predation will eliminate grayling recruitment. DFWP will evaluate whether the lake will be rehabilitated and restored to grayling or left in its present condition. There is currently strong public sentiment to retain the yellow perch fishery because of the presence of large (10"-14") fish. However, it appears likely the population will stunt within a few years, so management decisions will be delayed until that time. Reports of illegal walleye (Stizostedion vitreum) and northern pike (Esox lucius) introductions continue to surface without confirmation. A pamphlet entitled "Exotic Introductions, A Fishery Manager's Nightmare" was published and distributed by the Department. An article entitled "Illegal Aliens" was also submitted to the DFWP magazine Montana Outdoors during this report period.

Access

The Department acquired a fishing access site on Horseshoe Lake near Ferndale by purchasing land from Plum Creek Timberlands. Horseshoe Lake contains

smallmouth bass and pumpkinseeds. An access site was created on Lake Blaine where an adjoining county road and culvert project was modified to facilitate boat launching and public access. Lake Blaine contains largemouth bass, northern pike, and yellow perch as well as trout and kokanee.

Champion International generously donated about 4,000 acres of land to the State of Montana including several miles of shoreline and recreational area on 17 lakes extending from Lower Thompson Lake on the east to Loon Lake on the west. These lakes contain largemouth and smallmouth bass, northern pike, yellow perch, trout, and salmon. The Department is excited about the donation, but very concerned over management without additional funding.

Habitat Protection and Enhancement

Lakeshore protection applications, some requiring Department recommendations for mitigation, were processed through regional county agencies. There were a total of 10 COE 404 permits and applications for regional lakes and streams. Approximately 20 MPDES applications were reviewed, and numerous Water Quality Bureau turbidity exemptions were processed for the region.

A COE regional 404 permit was modified and approved to account for various structure types and expand the list of waters where habitat improvement may be permitted.

Fish populations were enhanced and habitat loss mitigated by enlisting the aid of Washington Water Power, the USFS, Western Montana Bassmasters, Clark Fork Bassmasters, and other local sportsmen groups to place habitat improvement structures. Waters receiving structure improvements include: Noxon Rapids Reservoir, Murphy Lake, Echo Lake, Middle Thompson Lake, Sophie Lake, and Triangle Pond. Warmwater fish spawning habitat was naturally improved during this water year after increased precipitation raised water levels well above recent drought levels.

DFWP cooperated with Washington Water Power to document effects of reservoir drawdown on benthic organisms and fish in Noxon Rapids Reservoir. The results of that study are reported in a special report segment by Huston (1990).

Smith Lake Creel Census

Smith Lake is a shallow 443 surface acre lake located nine miles west of Kalispell that supports good numbers and catches of yellow perch (Perca flavescens). Up to two-thirds of the fishing pressure occurs during winter months through the ice (Table 1). Preliminary data from field surveys are shown in Table 2. Final data will be reported following computer analysis.

Table 1. Annual fishing pressure (angler-days) estimates for Smith Lake from the statewide mail creel survey, 1982-1985.

Year	Total Pressure	Summer (%)	Winter (%)
1982	6315	2199 (34.8)	4116 (55.2)
1983	7178	3048 (42.5)	4130 (47.5)
1984	6535	2874 (44.0)	3661 (66.0)
1985	2756	1703 (61.8)	1053 (38.2)

Table 2. Smith Lake winter creel census 1989-1990.

				Yellow Perch		
Creel Period	No.Anglers Interviewed	Hr. Fished	Angler Catch	Catch Per Hr.	Mean Lgth	Std. Dev.
12/14/89-3/3/90 (79 days)	118	341	1457	4.27	7.7 in.	.65

Fishermen Impacts on Specified Fisheries

Fish tournaments are becoming increasingly popular in regional lakes. Four large scale DFWP registered bass tournaments were conducted during the period in addition to numerous unregistered smaller club derbies. To compile additional data from these tournaments a specific creel card was developed and distributed to local clubs (Appendix B). Concern is developing over potential injury and undue stress to fish caught and released during tournaments. The major concerns involve: 1) time of tournament in regard to spawning; 2) surface water temperature upon release; 3) prolonged holding and transportation of fish in live wells for scoring purposes; 4) transport of fish from home range. These issues are presently being discussed and will potentially result in a more conservative tournament policy.

RECOMMENDATIONS

There is an increasing demand for baseline population and habitat data on the 114 warmwater lakes within the region. As time allows we need to collect population indices for prioritized waters.

The number of bass fishermen and interest among them is ever increasing. Tournament requests, requests for special regulations, and concern over specific fisheries continue to come in at a greater frequency. Complaints about illegal

spear fishing are also more frequent as are complaints about mortality or injury to fish during tournaments. A more conservative policy will need to be evaluated that will reduce potential impacts from the above issues.

Habitat enhancement structures need additional evaluation. It is the intent of the aforementioned M. S. graduate study to incorporate the evaluation of different structure types.

LITERATURE CITED

Huston, Joe E. 1990. Northwest Montana coldwater lakes investigations, Noxon Rapids and Cabinet Gorge Reservoirs segment, July 1, 1989 through June 30, 1990, Project No. F-46-R-3, Job No. II-a, Montana Dept. of Fish, Wildlife and Parks, Helena, MT.

Prepared by: Scott Rumsey

Date: August 30, 1990

Waters referred to:

Cabinet Gorge Reservoir 5-8512
Horseshoe Lake 7-6800
Lee Metcalf Ponds
Lower Thompson Lake 5-9152
Murphy Lake 11-9280
Noxon Rapids Res. 5-9328
Rogers Lake 7-8400
Sophie Lake 11-9620
Triangle Pond 5-9685
Echo Lake 7-6180
Lake Blaine 7-5380
Loon Lake 11-8940
Middle Thompson Lake 5-9232
Ninepipe Reservoir 7-8100
Rattlebone Lake 11-9430
Smith Lake 7-8700
Thompson River 5-7248
Upper Thompson Lake 5-9760

Key Words: warmwater lakes; artificial habitat structures, smallmouth bass, largemouth bass, northern pike, exotic species introductions, water level fluctuation, fishing access acquisition

Appendix A

KNOWN SPECIES DISTRIBUTIONS - REGION 1
September, 1990
x = present xx = fishable population

Waterbody Name	River Drainage	Location T R S	Blue-gill	Brook Trout	Crappie	Grayling	Kokanee	Largemouth Bass	Smallmouth Bass	Northern Pike	Perch
Abbott Lake	Flathead	27 19 07						xx		xx	x
Alvord Lake	Kooteani	32 34 36						xx			xx
Ashley Lake	Flathead	28 23 01					xx				xx
Blanchard Lake	Flathead	30 22 02						xx		xx	xx
Blue Lake	Flathead	27 19 06						x			
Bowman Lake	Glacier Pk	37 21 00					xx				
Bull Lake - Troy	Kootenai	29 33 15					x	xx		x	
Burke Lake (Yaak Dist.)	Kootenai	37 33 07		xx							
Burnt Lake	Flathead	33 24 17		x							
Cabinet Gorge Reservoir	Clark Fork	27 34 19			x			xx	x	x	x
Church Slough	Flathead	28 20 31						xx		xx	x
Clark Fork Rv (FH to ID)	Clark Fork	27 34 24						x		x	
Crystal Lake	Kootenai	18 17 07					xx	x			xx
Dickey Lake	Kootenai	34 25 14						x		xx	
Dog Lake	Flathead	33 23 31		x						xx	
Double Lake	Flathead	28 19 23						x			
Duck Lake	Flathead	33 24 15		xx						x	
Echo Lake	Flathead	27 19 08						xx		xx	x
Egan Slough	Flathead	28 20 19								xx	x
Eli Lake	Clark Fork	27 27 32						x			
Estes Lake	Flathead	26 19 20						x			
Fennon Slough	Flathead	27 20 16						xx		xx	x
Finger Lake	Flathead	33 24 22		xx							
Fire Lake	Flathead	33 24 07		x							
Fish Lake	Kootenai	34 24 29		xx							
Flathead Lake	Flathead	22 19 00					x			x	
Flathead Lake (Polson Bay)	Flathead	22 20 00						x			xx
Flathead River - lower	Flathead	19 25 34						x		xx	x
Flathead River -Lk to OSB	Flathead	27 20 34								x	
Flathead Rv Sinkholes-Lower	Flathead	18 22 15						xx		xx	
Flathead Rv Sloughs-Lower	Flathead	19 23 00						x		xx	
Glen Lake	Kootenai	36 26 21					xx				
Graves Creek	Flathead	27 17 06				xx					
Grouse Lake	Kootenai	30 34 11		xx							
Half Moon Lake	Flathead	31 19 03						x			xx
Handkerchief Lake	Flathead	27 18 01				xx					x
Hidden Lake	Flathead	22 18 19								x	
Holland Lake	Flathead	20 16 35					x				
Horseshoe Lake - Ferndale	Flathead	26 19 15						x	xx	x	
Horseshoe Lake - Hwy. 2	Kootenai	27 28 23						x	x		x
Hungry Horse Reservoir	Flathead	29 18 00				x					
Island Lake	Kooteani	29 26 30						xx			xx
Jessup Mill Pond	Flathead	28 20 11		xx							
Kicking Horse Reservoir	Flathead	20 19 30						xx			
Kilbrennan Lake	Kootenai	33 33 28		xx							
Kintla Lake	Glacier Pk	36 20 00					xx				
L.Flathead Rv Sinkholes	Flathead	18 22 15						xx		xx	
L.Flathead Rv Sloughs	Flathead	19 23 00						x		xx	

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Waterbody Name	River Drainage	Location T R S	Blue-gill	Brook Trout	Crappie	Grayling	Kokanee	Largemouth Bass	Smallmouth Bass	Northern Pike	Perch
Lagoni Lake	Flathead	33 24 26								x	xx
Lake Blaine	Flathead	29 20 25					x	xx		xx	x
Lake Five	Flathead	31 19 09						x			xx
Lake Mary Ronan	Flathead	25 22 11					xx	xx			
Lake McDonald	Glacier Pk	32 18 00					x				
Lake Monroe (L. Ashley)	Flathead	27 23 04								xx	
Lindbergh Lake	Flathead	18 17 02					x				
Lion Lake	Flathead	30 19 09						x		xx	x
Little Bitterroot River	Flathead	20 22 00								xx	
Little Loon Lake - Hwy.2	Kootenai	27 28 14						xx	x		
Little McGregor Lake	Flathead	26 25 04		xx				x			x
Logan Creek	Flathead	31 23 29								x	
Lone Lake (Mid.Ashley Lk)	Flathead	28 24 36					x			x	
Lonepine Reservoir	Flathead	22 24 00								xx	x
Loon Lake - Ferndale	Flathead	26 19 10						x	x	x	xx
Loon Lake - Hwy. 2	Kootenai	27 28 22						xx	x		
Lost Coon Lake	Flathead	30 22 02						x		xx	
Lost Lake	Flathead	26 21 08		x							
Lost Lake	Clark Fork	27 27 26		x							
Lost Lake - Happy's Inn	Kootenai	27 27 07		x							
Lower Blossom Lake	Clark Fork	21 32 30		xx							
Lower Martin Lake	Flathead	32 24 10								x	x
Lower Stillwater Lake	Flathead	32 23 00								xx	x
Lower Thompson Lake	Clark Fork	26 27 11					x	xx		x	xx
Lynch Lake	Kootenai	28 26 14		x				x			xx
Marl Lake	Flathead	34 26 03								x	
Martin Lake - Stryker	Kootenai	34 25 04		x							
McCaffery Lake	Flathead	27 19 18						xx			
McWenneger Slough	Flathead	28 20 06								xx	xx
Middle Thompson Lake	Clark Fork	26 27 04					xx	xx		x	xx
Miller Lake	Kootenai	25 29 00		x							
Milnor Lake	Kootenai	31 33 28						x		x	
Moran Lake	Kootenai	37 27 21						xx			
Mud Lake	Flathead	27 19 10		x				x		x	
Murphy Lake - Fortine	Kootenai	34 25 05						xx		x	x
Ninepipes Reservoir -I.R.	Flathead	19 20 02						xx			xx
Noxon Rapids Reservoir	Clark Fork	26 33 00						xx	xx	x	x
Pablo Reservoir	Flathead	22 20 27						xx			
Parker Lake	Flathead	26 20 30						xx			
Peterson Lake	Flathead	27 19 07						xx		xx	x
Pothole Lakes	Flathead	27 19 00						xx			
Rainbow (Dog) Lake	Clark Fork	20 25 03								xx	x
Rainbow Lake - Hwy. 2	Kootenai	27 27 30						x			
Rattlebone Lake	Flathead	34 25 22						xx			
Red Meadow Lake	Flathead	34 23 34				xx					
Rogers Lake	Flathead	27 23 31		xx		xx					xx
Savage Lake	Kootenai	31 33 27		x				xx			
Skyles Lake	Flathead	31 22 33						xx			

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September, 1990
x = present xx = fishable population

Waterbody Name	River Drainage	Location T R S	Blue-gill	Brook Trout	Crappie	Grayling	Kokanee	Largemouth Bass	Smallmouth Bass	Northern Pike	Perch
Slee Lake - private	Kootenai	31 33 00						x			
Smiley's Slough	Clark Fork	20 26 28			x			x			xx
Smith Lake	Flathead	27 22 00		x							
Smith Lake - Whitefish	Flathead	32 22 32		x							
Smokey Lake	Flathead	33 24 17		x							
Sophie Lake	Kootenai	37 27 15						xx		x	
Spar Lake	Kootenai	29 34 21		x			xx				
Spill Lake	Flathead	27 19 07						x			
Spoon Lake	Flathead	31 20 03		x							
Stillwater River	Flathead	28 21 00								xx	xx
Sunrise Lake	Flathead	30 23 13								x	
Swan Lake	Flathead	25 18 14					xx	x		xx	x
Swan River - Porcupine Cr	Flathead	27 20 36								x	
Swan River - backwaters	Flathead	27 19 32								x	
Swimming Lake	Flathead	28 20 14						x			
Swisher Lake	Kootenai	37 27 17		x							
Sylvan Lake	Kootenai	25 29 24		x							
Sylvia Lake	Flathead	30 25 20				xx					
Tally Lake	Flathead	30 23 00					x			xx	
Tamarack Lake	Flathead	36 24 36						x			
Tetrault Lake (Carpenter)	Kootenai	37 27 27	xx					xx			
Thompson Falls Reservoir	Clark Fork	21 29 08						x		x	
Troops Lake - private	Kootenai	31 33 16						x			
Upper Blossom Lake	Clark Fork	21 32 30		xx							
Upper Foys Lake	Flathead	28 22 23						x			x
Upper Martin Lake	Flathead	32 24 10								x	
Upper Red Meadow Creek	Flathead	35 21 05				x					
Upper Slee Lake - private	Kootenai	31 33 06						x			
Upper Stillwater Lake	Flathead	33 23 00								xx	x
Upper Sunday Lake	Flathead	33 24 07						x			
Upper Thompson Lake	Flathead	27 27 30						xx	x	xx	xx
West Lake (private)	Flathead	31 19 16						x			
Whitefish Lake	Flathead	31 22 00								xx	
Whitefish River	Flathead	28 21 00								xx	

Appendix B

(front of card)

ANGLER REPORT FORM
***For ALL Fish Caught or Released**

Name_____ Date ___/___/___ No. Anglers____ Total Hrs. Fished_____Completed Trip ___Y ___N

Fish Species	Length/Weight	Time	Kept Y N	Cover*	Depth

Fish Species	Length/Weight	Time	Kept Y N	Cover*	Depth

(over)

(back of card)

Fish Species	Length/Weight	Time	Kept Y N	Cover*	Depth

Fish Species	Length/Weight	Time	Kept Y N	Cover*	Depth

Species	No. Fish Observations <6"	6-11.9"	12-16"	>16"

Conditions
Water Temp_____ Air Temp_____
Circle: clear cloudy
rain partly cloudy

*Most fish caught or observed were in what cover type (circle 1 or more)?

1. in or near weeds
2. open shoreline
3. near natural structure (submerged trees)
4. near placed structure--Christmas trees, cribs, docks
5. in shade
6. in open sunlight
7. other (specify) _____

Ref: SR74.90 5/8/90