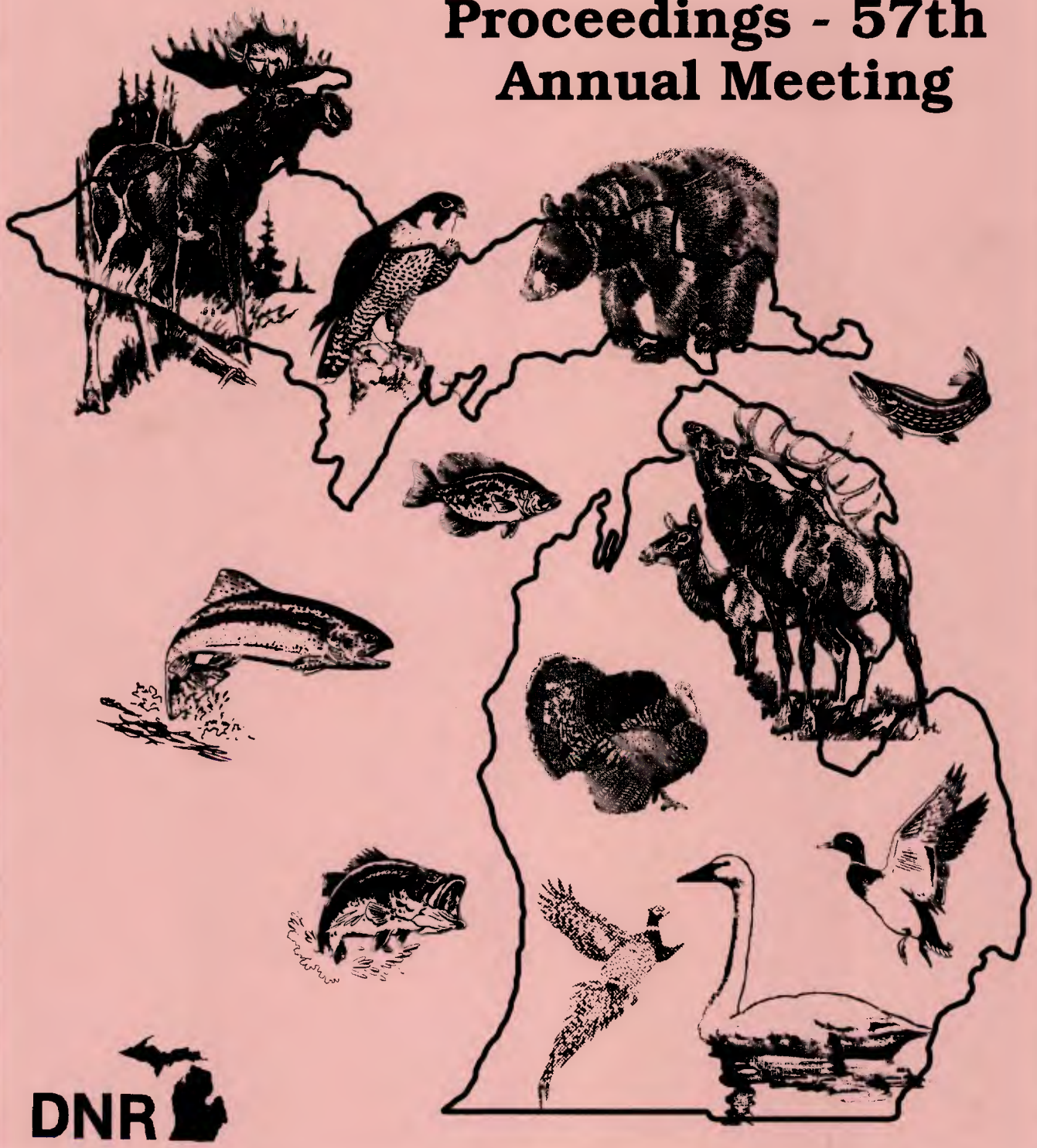
Association of Midwest Fish & Wildlife Agencies

Proceedings - 57th Annual Meeting



DNR

PROCEEDINGS OF THE 57th ANNUAL MEETING

ASSOCIATION OF MIDWEST FISH AND WILDLIFE AGENCIES

JULY 16-19, 1990

AMWAY GRAND PLAZA HOTEL
GRAND RAPIDS, MICHIGAN

ASSOCIATION MEETING PLACES AND DATES

1. Des Moines, Iowa 1934
2. St. Paul, Minnesota 1935
3. Madison, Wisconsin 1936
4. Sioux Falls, South Dakota . 1937
5. Omaha, Nebraska 1938
6. Madison, Wisconsin 1939
7. Mason City, Iowa 1940
8. St. Louis, Missouri 1941
9. Duluth, Minnesota 1942
10. Fox Lake, Illinois 1943
11. Bismarck, North Dakota . . . 1944
12. Indianapolis, Indiana . . . 1945
13. Rapid City, South Dakota . . 1946
14. Roscommon, Michigan 1947
15. Put-in-Bay, Ohio 1948
16. Lincoln, Nebraska 1949
17. Milwaukee, Wisconsin 1950
18. Wichita, Kansas 1951
19. Des Moines, Iowa 1952
20. Dorset, Ontario 1953
21. St. Louis, Missouri 1954
22. Estes Park, Colorado 1955
23. Springfield, Illinois . . . 1956
24. Park Rapids, Minnesota . . . 1957
25. Bismarck, North Dakota . . . 1958
26. West Lafayette, Indiana . . 1959
27. Rapid City, South Dakota . . 1960
28. Higgins Lake, Michigan . . . 1961
29. Omaha, Nebraska 1962
30. Columbus, Ohio 1963
31. Milwaukee, Wisconsin 1964
32. Toronto, Ontario 1965
33. Wichita, Kansas 1966
34. Des Moines, Iowa 1967
35. Chicago, Illinois 1968
36. St. Louis, Missouri 1969
37. Winnipeg, Manitoba 1970
38. Aspen, Colorado 1971
39. Wichita, Kansas 1972
40. Bismarck, North Dakota . . . 1973
41. Duluth, Minnesota 1974
42. Traverse City, Michigan . . 1975
43. Rapid City, South Dakota . . 1976
44. Lincoln, Nebraska 1977
45. Madison, Wisconsin 1978
46. Nashville, Indiana 1979
47. Columbus, Ohio 1980
48. Des Moines, Iowa 1981
49. Springfield, Illinois . . . 1982
50. Lexington, Kentucky 1983
51. Hannibal, Missouri 1984
52. Wichita, Kansas 1985
53. Vail, Colorado 1986
54. Winnipeg, Manitoba 1987
55. Bismarck, North Dakota . . 1988
56. Duluth, Minnesota 1989
57. Grand Rapids, Michigan . . 1990

REGISTRANTS AT 1990 MIDWEST CONFERENCE
Grand Rapids, Michigan

Adams, Lyle L.
314 Fairway
Taylorville, IL 62568

Alexander, Gaylord R.
Michigan Dept. of Natural Resources
P. O. Box 30028
Lansing, MI 48909

Allen, James
Illinois Dept. of Conservation
524 South Second Street
Springfield, IL 62706

Babcock, Kenneth M.
Missouri Dept. of Conservation
P. O. Box 180
Jefferson City, MO 65102-0180

Bails, Jack D.
Michigan Dept. of Natural Resources
P. O. Box 30028
Lansing, MI 48909

Burgoyne, George E., Jr.
Michigan Dept. of Natural Resources
P. O. Box 30028
Lansing, MI 48909

Christian, John I.
U. S. Fish & Wildlife Service
Federal Building, Fort Snelling
Twin Cities, MN 55111

Colpitts, Lorne
Manitoba Dept. of Natural Resources
1495 St. James Street
Winnipeg, Manitoba R3H 0W9

Duffy, Joan
Michigan Dept. of Natural Resources
P. O. Box 30028
Lansing, MI 48909

Eadie, John R.
U. S. Fish & Wildlife Service
Federal Building, Fort Snelling
Twin Cities, MN 55111

Elden, Richard C.
Michigan Dept. of Natural Resources
P. O. Box 30028
Lansing, MI 48909

Feldt, Robert
Indiana Dept. of Natural Resources
608 State Office Building
Indianapolis, IN 46204

Hales, David F.
Michigan Dept. of Natural Resources
P. O. Box 30028
Lansing, MI 48909

Hansen, Doug
South Dakota Game, Fish and Parks
445 East Capital
Pierre, SD 57501

Hawks, Steve
Kansas Dept. of Wildlife and Parks
Box 54A, Rural Route 2
Pratt, KS 67124

Hess, Robert E.
Michigan Dept. of Natural Resources
P. O. Box 30028
Lansing, MI 48909

Holmes, Roger
Minnesota Dept. of Natural Resources
500 Lafayette Road, Box 7
St. Paul, MN 55155

Hosford, Karl R.
Michigan Dept. of Natural Resources
P. O. Box 30028
Lansing, MI 48909

Houghton, Walter C.
Michigan Dept. of Natural Resources
P. O. Box 30028
Lansing, MI 48909

Kammer, Kerry
Commissioner
Michigan Dept. of Natural Resources
P. O. Box 30028
Lansing, MI 48909

Lange, Robert E., Jr.
U. S. Fish & Wildlife Service
Federal Building, Fort Snelling
Twin Cities, MN 55111

LaPointe, George
International Association
of Fish & Wildlife Agencies
Hall of the States
444 North Capitol Street, NW, Suite 534
Washington, DC 20001

Lowry, Gerald R.
U. S. Fish & Wildlife Service
Federal Building, Fort Snelling
Twin Cities, MN 55111

McCloskey, Bruce L.
Colorado Division of Wildlife
6060 Broadway
Denver, CO 80216

McMullin, Steve
Oregon of Wildlife Planners

Milne, Barbara A.
U. S. Fish & Wildlife Service
Federal Building, Fort Snelling
Twin Cities, MN 55111

Moriarty, Marvin
U. S. Fish & Wildlife Service
Federal Building, Fort Snelling
Twin Cities, MN 55111

Nielsen, Larry
Oregon of Wildlife Planners

Pierce, Richard
Ohio Division of Wildlife
Fountain Square
Columbus, OH 43224

Robertson, John M.
Michigan Dept. of Natural Resources
P. O. Box 30028
Lansing, MI 48909

Scherschligt, O. J.
Michigan Dept. of Natural Resources
P. O. Box 30028
Lansing, MI 48909

Schmeler, Lori A.
Michigan Dept. of Natural Resources
P. O. Box 30028
Lansing, MI 48909

Schmeler, Rex A.
Michigan Dept. of Natural Resources
P. O. Box 30028
Lansing, MI 48909

Seelbach, Paul W.
Michigan Dept. of Natural Resources
P. O. Box 30028
Lansing, MI 48909

Squibb, (Pete) Harry W.
Michigan Dept. of Natural Resources
P. O. Box 30028
Lansing, MI 48909

Sylvester, Joseph R.
Michigan Dept. of Natural Resources
P. O. Box 30028
Lansing, MI 48909

Talsma, Art R.
215 South Lincoln
Pierre, SD 57501

Urbain, John W.
Michigan Dept. of Natural Resources
P. O. Box 30028
Lansing, MI 48909

Westers, Harry
Michigan Dept. of Natural Resources
P. O. Box 30028
Lansing, MI 48909

Whalen, Gary
Michigan Dept. of Natural Resources
P. O. Box 30028
Lansing, MI 48909

Williams, Jane A.
Michigan Dept. of Natural Resources
P. O. Box 30028
Lansing, MI 48909

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Illinois O
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Michigan O
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Nebraska O
North Dakota O
Ohio ✓
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✓ = not present
O = present

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Association of Midwest Fish and Wildlife Agencies

Agenda

Monday, July 16, 1990

1:00 p.m. - 5:00 p.m.	**Registration** - North Concourse
6:00 p.m. - 8:00 p.m.	**Welcome Reception**-Pearl Room

Tuesday, July 17, 1990

8:00 a.m. - 8:30 a.m.	**Continental Breakfast/Registration** - Vandenberg B Room
8:30 a.m. - 9:00 a.m.	**Welcome** - *David F. Hales*, Director, Michigan Department of Natural Resources
9:00 a.m. - 10:30 a.m.	**Species Introduction** - Moderator *Karl Hosford*, Chief of Wildlife Division Sichuan Pheasant Moose Peregrine Falcon Questions and Answers
10:30 a.m. - 10:45 a.m.	**BREAK**
10:45 a.m. - 11:15 a.m.	**Management Of Southern Michigan Game Areas** - Wildlife Division
11:15 a.m. - 12:00 Noon	**Trails Management And Funding**- Moderator - *O. J. Scherschligt*, Chief of Recreation Division
12:00 Noon - 1:30 p.m.	**LUNCH** - ***Natural Resources Challenges of the 90's***-Education and Youth Moderator- *Tom Washington*, Executive Director of Michigan United Conservation Clubs Vandenberg A Room
1:30 p.m. - 2:30 p.m.	**Management Issues Of The Great Lakes** - Moderator-*J. D. Snyder*, Chief of the Office of the Great Lakes
2:30 p.m. - 2:45 p.m.	**BREAK**
2:45 p.m. - 4:00 p.m.	**Fishery Issues** -Moderator *John Robertson*, Chief of Fisheries Division Watershed Management FERC Relicensing Warm Water River Project Hunt Creek Erosion Project
4:00 p.m. - 4:15 p.m.	**Overview of Tour** - *Karl Hosford/John Robertson*
4:15 p.m. - 5:30 p.m.	Organization of Fish and Wildlife Planners
6:00 p.m. - 8:00 p.m.	**President's Reception** - Pearl Room

Wednesday, July 18, 1990

10:00 a.m.	**Board Buses**
11:00 a.m. - 11:30 a.m.	**Wolf Lake Fish Hatchery Tour**
11:30 a.m. - 12:00 Noon	**Great Lakes Fishery Management**
12:00 Noon - 1:00 p.m.	**LUNCH**
1:00 p.m.	**Board Buses**
1:30 p.m. - 2:30 p.m.	**Tour Of Allegan State Game Area**
3:15 p.m.	**Arrive At Hotel**
4:30 p.m.	**Leave For Grand Haven**
5:00 p.m.	**Trolley Tour Of Grand Haven**
6:00 p.m.	**DINNER** - On the beach

Thursday, July 19, 1990

8:00 a.m. - 8:30 a.m.	**Continental Breakfast** - Pearl Room
9:00 a.m. - 12:00 Noon	**Business Meeting**

THE SICHUAN PHEASANT, MICHIGAN'S NEWEST PIONEER

Harry W. Squibb
Michigan Department of Natural Resources
Wildlife Division
Box 30028, Lansing, Michigan 48909

Ringneck pheasant populations in Michigan have followed the downward trend experienced in other midwestern and eastern states during the past 30 years. Populations, which provided Michigan hunters with more than a million roosters annually during the 1940s and 1950s, dropped to record low levels in the 1980s. Pheasant hunter numbers have declined by more than 60 percent.

Everyone with an interest--the hunter, the farmer, the wildlife biologist--has their theory on what caused the ringneck decrease. Some say it was pesticides, others insist it was fall plowing, still others think it was the clearing of fence rows and enlargement of farm fields to operate modern farm machinery, or the natural cycle of an introduced species. One thing is sure, ringneck pheasant populations dropped dramatically, as habitat changed, not just in Michigan but throughout the North American range. The stately ringneck simply has not been able to survive direct competition with modern farming methods.

In an attempt to boost Michigan's dwindling pheasant numbers, the Wildlife Division considered many alternatives. One, which has been on the list of many states and the United States Fish and Wildlife Service for more than 30 years, was the possibility of acquiring wild pheasants from their native range in China. It was thought that one of the 40 or so subspecies of common pheasant found in China might adapt to the habitat now available in the Great Lakes states. In Michigan, this is marginal farmlands where brush, idle fields, and woodlots prevail.

Michigan pheasants, and pheasants in the eastern half of the United States, are not direct descendants of wild Chinese stock. Only one or two original shipments of pheasants came directly from China to North America. The exact source of Michigan's original ringneck stock, released here in the early 1900s, is not known. What is known is that those birds, and others released east of the Mississippi, had a European game farm background, as they were imported to England and France from their native China several hundred years

earlier. In Europe, pheasants were propagated by feudal lords on game farms for aesthetic reasons. We feel that this long-term, artificial selection reduced the genetic flexibility of the birds enough to limit their ability to adapt to changing natural habitats.

Since the 1940s, when the first major decline of pheasants in North America was observed, many states and the federal government have tried to secure wild birds from China. Those efforts were unsuccessful, due mainly to the political climate between the two countries. In 1972, relations warmed to the point where trade and exchanges of technology and knowledge became common.

Under a sister-state arrangement, Michigan sent a request for pheasants to the Sichuan Province Foreign Affairs Office in October 1983. In December 1983, a hoped-for "yes" was received from the Chinese. Specifically, they offered Michigan a gift of 200 wild pheasants to promote friendly relations and initiate the exchange of scientific knowledge.

During a visit in 1984 to enhance the exchange of scientific knowledge, we were told that wild pheasant eggs could be collected in the remote, mountainous areas of northern Sichuan Province. We agreed to initiate an egg collecting operation in spring 1985, hoping to obtain up to 1,000 eggs from wild nests.

In May 1985, a team of three biologists from Michigan spent the next three weeks observing pheasant habitat during a 1,200-mile trip through northwest Sichuan Province. This trip allowed the observation of common pheasants in just about every conceivable habitat, from sub-tropical rice paddies to 13,000-foot, sub-alpine meadows. The team was able to collect valuable information from observing pheasants in the wild; much was learned about the life requirements and feeding habits of the Sichuan birds.

The area selected for egg collection and subsequent research was marginal farm country at an elevation of 4,000 to 6,000 feet. The habitat and climate conditions closely match the northern coastal lakes region in the United States, which we feel can support pheasant

populations. The sub-species of pheasant in this area is the Strauch pheasant. Phasianus strauchii is very similar in appearance to the North American ringneck but lacks the distinct white neck ring.

Egg collections were carried out in a remote, 300 square mile area of northern Sichuan Province during the spring of 1985 and 1988. A subsequent research trip was carried out in 1987 to intensely study nesting and brood rearing habitat of the Sichuan pheasants. In total, approximately 3,600 eggs were collected during the combined two periods from over 750 nests. A total of nearly 900 chicks were hatched from these eggs.

Each clutch of eggs was individually marked and tracked throughout the collection, packaging, shipping, and incubation process. Individual chicks were wing banded, when they were a day old, as permanent identification for future breeding purposes.

From the arrival of the first chicks in 1985, dramatic changes have been made in the traditional game farm management at the Mason Wildlife Facility. The breeding and rearing of these birds were carried out to achieve two objectives. The first objective was to develop a pen management scheme which would limit genetic selection due to the birds inability to adapt to a penned situation. The second was to develop a breeding management scheme which would allow the highest possible egg production without sacrificing the genetic diversity which has allowed these birds to adapt to such a wide spectrum of climatic and habitat situations in China.

The first release of 335 birds into a 35 square mile area of southeastern Michigan in 1987 has grown to a release of approximately 9,000 birds into a 1,000 square mile area involving portions of nine southeastern counties.

Long-term objectives are to raise and release up to 60,000 birds annually into all identified habitat areas of the state by 1993. Spring production in 1990 should allow for the release of 20,000 birds in 1991.

Since the first acquisition of eggs/chicks in 1985, much has been learned about this bird through extensive research in penned conditions and in the wild. Since 1987, telemetry data has been gathered from more than 700 birds. Data on dispersal, production, and habitat selection and use have been used each year to develop future management decisions and direction.

Three very important points continue to make us optimistic for the future of this program. The high nesting success of the hens (50 to 80 percent), the good survival of chicks from hatching to fall (40 to 50 percent), and the selection of nonagricultural habitat types for nesting and early brood rearing, makes us optimistic that these birds may hold the key for increased pheasant numbers in Michigan and many midwestern and eastern states.

6/22/90

The Reintroduction of Moose to Michigan

George E. Burgoyne, Jr.
Wildlife Division
Michigan Department of Natural Resources

The moose (Alces alces), is not only the largest surviving member of the deer family, it is found on each of the northern continents, Europe, Asia, and North America. The moose was once native to Michigan, reported by early French explorers in both the Upper and Lower Peninsulas.

Although given full protection in 1889, moose disappeared from both of Michigan's peninsulas. The changes brought about by extensive logging in the 19th century drove the moose in Michigan to near if not actual extinction. First, the extensive logging destroyed millions of acres of habitat. Second, the loggers almost certainly exploited the moose for enlivening logging camp cuisine. Third, and perhaps most devastating was the brain worm, a nematode, carried by the white-tailed deer as they expanded rapidly into the disturbed habitat which followed logging and associated fires.

This parasite, (Parelaphostrongylus tenuis), produces almost no significant clinical disease in the white-tailed deer but is thought to always be fatal in moose. Infected moose, display weakness in the hind quarters, holding the head to one side, circling, blindness, paralysis, and death.

From 1935 to 1937, the Michigan Department of Conservation attempted reintroducing the moose to the Upper Peninsula by through capturing, crating, and shipping 69 moose from Isle Royale to the mainland for release in Keweenaw, Marquette, and Schoolcraft counties. This reintroduction attempt failed because the moose were in poor condition, poaching, and high deer numbers in the release areas. Many of these moose died from what was described as "Circling disease," most likely the brain worm parasite. Some reports suggest that a few moose survived in the Keweenaw Peninsula where deer numbers were somewhat lower until the institution of meat rationing in World War II.

During the 1960s moose were occasionally observed coming into the Upper Peninsula across the St. Mary's River. However, it appeared that these moose were too few and too scattered to establish a breeding population and calves were seldom reported. In addition, it appeared that these natural immigrants were often taken by poachers.

In the 1970s, MDNR Regional Wildlife Biologist, Ralph Bailey, recognized that natural forest succession had changed the forest in much of the Lake Superior watershed portion of the Upper Peninsula from deer habitat into potential moose habitat. On two different occasions, the Department brought moose management specialists from Ontario to evaluate areas of the Upper Peninsula for potential moose habitat. The moose specialists agreed that Michigan again had moose habitat and might support a population of about 1,000 moose.

Mr. Bailey's recommendation to seek moose for restocking the Upper Peninsula "sat on the back burner" for a number of years. But in the early 1980s the Division took a serious interest in the project. Since the connection between brain worm carried by deer and moose mortality had been identified, the Wildlife Division carried out several winter surveys to determine the proportion of deer carrying the brain worm. Although it was estimated from the surveys that the vast majority of deer were infected with the brain worm, other expert advice suggested that if the deer population was below 10 deer per square mile, the frequency of transmission to moose would be low enough that the reproductive capacity of the moose would more than counterbalance these losses.

Since the average deer population in the Lake Superior watershed portion of the Upper Peninsula was certainly less than 10 per square mile, the Department began to explore potential sources for moose to be introduced. Although several states were considered, the Province of Ontario was first to step forward with a serious offer of a source of moose for transfer.

The Canadians identified three potential sites to obtain the moose. A task force of wildlife managers from Ontario and Michigan reviewed each site on the ground and from the air and settled on Algonquin Provincial Park, located east of Lake Huron. The park is a single block of almost 3,000 square miles with an unhunted moose population of between 4,000 and 6,000 animals. A similar review of potential release sites in the Upper Peninsula led to the selection of the area north of Lake Michigamme, located about 40 miles west of Marquette.

Midwinter was selected for the operation to take advantage of several factors. The frozen lakes would provide open areas for capture and handling sites since we had decided to use helicopters to capture and transport moose in the roadless areas of Algonquin Provincial Park. In addition, the cow moose would be carrying calves as small embryos, providing the opportunity for getting two and sometimes three moose for the effort required to capture and move one. Finally, the cold temperature would help the moose cope with the drugs used for their capture and the general stress associated with being handled by humans.

Held in late January and early February of 1985, the first "Moose Lift" as it became known, resulted in the release of 29 moose in Michigan, 19 cows and 10 bulls. Since we knew that a single bull moose can breed several cows, we believed that the ratio of two cows per bull was a prudent sex structure for the initial population. Calf production and survival that spring was excellent with the 19 cows producing 21 calves. However, that spring 3 bulls died of unknown causes and another headed east across the peninsula, leaving only 6 widely scattered bulls to breed the 19 cow moose. That fall, a number of the cows were left unbred.

When these same cow moose produced only 10 calves in the Spring of 1986 we consulted again with our moose experts in Ontario. The combined Michigan and Ontario team decided that the newly introduced moose population could be successful without additional translocated moose, but a second translocation of 60 moose would be advisable.

That operation, which came to be know as "Moose II," took place in early February, 1987, and resulted in the translocation of 30 moose, 15 bulls and 15 cows. The animals were released in the same area as the first group. As predicted, these translocated moose have prospered in spite of loosing a few each year to brain worm and a variety of natural causes from falling off cliffs, rutting injuries, to birthing problems. Calf survival through their first year has been a surprising 82%. In addition, poaching losses have been virtually nonexistent, because the citizens of the Upper Peninsula were involved with the project and adopted the new moose population as their own.

In addition the moose which have continued to cross the St. Mary's River have received new respect and have not been subject to the same poaching problems to

which their predecessors succumbed. The total population across the Upper Peninsula now numbers about 250 animals. The biggest threat to the moose population is the growing population of deer. Deer numbers have increased significantly as a result of the several mild winters which have blessed the midwest. We expect that the Michigan moose population will come very close to our original goal of 1,000 animals by the year 2000.

A large portion of the funding for the project came from private funds. While the Michigan Involvement Committee, of the state chapters of Safari Club International, was the major private contributor, other groups such as Michigan's Loyal Order of the Moose, the Upper Peninsula Sportsmens' Club, several Lions Club chapters, and Michigan United Conservation Clubs contributed. All of those who have been involved are very honored to have been a part of the reintroduction of this magnificent, if somewhat homely, part of Michigan's natural heritage.

June 1, 1990

MICHIGAN'S PEREGRINE FALCON RESTORATION PROGRAM

Robert E. Hess
Department of Natural Resources
Wildlife Division
Box 30028, Lansing, Michigan 48909

Michigan has been involved in the peregrine restoration program since 1986 with the first releases occurring in Grand Rapids. Since that first release, 74 falcons have been released at five sites: two urban sites, Grand Rapids and Detroit, and three sites in the Upper Peninsula (U.P.).

This summer, our fifth year in the program, has been an exciting year. We have four nesting pairs in the state, one in Detroit and three in the Upper Peninsula. If any of these pairs are successful, they will produce the first Michigan peregrines to fledge from a wild nest in more than 30 years.

Our goal in Michigan is to have ten nesting pairs of peregrines by the year 2000. Statewide plans call for the release of a total of 125 falcons through 1993.

This summer we had planned to release 20 falcons from three sites in the Upper Peninsula with releases occurring from an interior cliff near Bergland in the western U.P., from cliffs along Lake Superior at Pictured Rocks National Lakeshore near Munising, and on Isle Royale National Park. Because of our early success at having falcons return to Bergland and Pictured Rocks this year, and the threat of these adult, territorial falcons killing newly released falcons, we moved the two mainland releases to Isle Royale. We are encouraged by this early success despite the inconvenience it has caused.

The peregrine is one of three falcons species native to Michigan, the others being the merlin and kestrel. Populations of all three species were seriously reduced by the use of DDT and other hard pesticides. As was the case in other Midwestern states, peregrines were completely eliminated as a nesting species by the mid-1960s. Twelve historic nest sites, or eyries, have been recorded in Michigan, all on cliffs in the U.P. except for one site on a 300-foot sand dune on North Fox Island in northern Lake Michigan. The last successful nest known to occur in Michigan was recorded in 1957 on a cliff on the north shore of Lake Michigan in Delta County.

Our restoration program in Michigan is part of a larger Midwest effort coordinated through the University of Minnesota Raptor Research and Rehabilitation Center. As with other states in the region, Dr. Pat Redig and Dr. Bud Tordolf from the University have been our mentors, helping establish our program, requisitioning falcons, and providing much technical assistance and advice.

The Michigan peregrine program has been coordinated by Natural Heritage Program staff in the Department of Natural Resources (DNR) Wildlife Division. Much of the funding has been provided by the Michigan Nongame Wildlife Fund through citizen contributions to a checkoff on the state income tax form.

The Grand Rapids and Detroit Audubon Societies raised matching funds to co-sponsor the urban releases. The Upper Peninsula releases have been a cooperative effort among the DNR, U.S. Forest Service (USFS)-Ottawa National Forest, and the National Park Service (NPS)-Isle Royale National Park and Pictured Rocks National Lakeshore. The Michigan United Conservation Clubs, Upper Peninsula Sportsman's Alliance, Detroit Audubon, and other private organizations and corporations also provided major funding for the U.P. project.

The first Michigan releases were made in urban areas. During these releases, special emphasis was placed on involving the public and local organizations in an effort to increase awareness of the plight of the peregrine and to raise support for the statewide recovery effort. News conferences were held when the falcons arrived and again when they were released. Video cameras were set up to photograph the falcons at the release site with T.V. monitors installed in building lobbies and downtown malls allowing the public to view the activities of the falcons. The releases were heavily covered by local news media throughout the release period.

In June 1988, a pair of falcons appeared in Detroit just one year after the first release. The male, named Solo, was from a 1987 release in Grand Rapids and the female, Bogey, was from the 1987 Detroit release. Because they were only one-year old and not nesting, it was decided to continue with the release of six falcons that year. No aggression was shown toward the young falcons by the one-year-old pair while the young falcons were in the hack box. However, when

the young began to fly, Solo attacked and killed one of the young males. Four of the other five young were quickly live trapped. We were unable to trap the last young falcon and it died from injuries after being knocked to the ground by Solo. The four trapped falcons were moved to release sites in Grand Rapids and the Upper Peninsula and released there.

Solo and Bogey remained in Detroit for much of that winter. In February, Bogey was observed in Toronto. A new female appeared in Detroit the next spring. This female was from a 1984 release in Montreal, Quebec. She mated with Solo. They were the first pair to nest in Michigan since the restoration program began. However, they failed to raise any young after two nesting attempts. Both falcons remained in Detroit during the winter of 1989-90. In March of this year, the Montreal female was replaced by an unbanded female. Breeding activity by this new pair was observed for several weeks in April and May, but no nest has been located in Detroit.

The first releases in northern Michigan occurred in 1987 on Isle Royale. Five falcons were released from Feldtman ridge, a cliff on the interior of the island. Releases have continued in 1988 and 1989. Although individual falcons have returned, no falcons have returned to nest on Isle Royale thus far. A female released on Isle Royale in 1988, nested in Milwaukee in 1989 and raised two young. This Isle Royale female is nesting in Milwaukee again this year.

Releases on the mainland of the Upper Peninsula began in 1988. Release sites were selected after conducting a comprehensive study of six cliff sites. The DNR, USFS, and NPS contracted the study. Data was collected at each site on prey abundance and diversity, quantity of hunting habitat available, great horned owl populations, human disturbance levels, and contaminant levels in prey species. Four cliff sites were selected and releases scheduled based on the priority established by the study.

Trap Hills on the Ottawa National Forest was the first site chosen. In 1988, five falcons were released from this 300-foot cliff site near Bergland in the western U.P. In 1989, ten more falcons were released here. Three falcons returned in the mid-summer of 1989 from the five released here in 1988. They fed at the release site with the young falcons and were not aggressive toward them. In anticipation of falcons returning this spring, an alternate site was developed on the Ottawa

National Forest for use in 1990. Two falcons returned to the Trap Hills site this spring and are nesting too close to either site to allow its use as a safe release site. The falcons scheduled for release at Trap Hills were transferred to Isle Royale and released there this June.

In 1989, the Pictured Rocks National Lakeshore near Munising became the second mainland release site to be used in the Upper Peninsula. Ten falcons were released from a double hack box on a cliff above Lake Superior. This spring, after just one year, a pair of falcons has returned and is nesting two miles from the release site. Because of this early success, this year's release of seven falcons at Pictured Rocks has been rescheduled for Isle Royale.

It is very satisfying to see such success, having three pairs of falcons nesting in the Upper Peninsula after just two years of releases, and a pair of falcons in Detroit. We expect to reach our Michigan goal of ten nesting pairs by the summer of 1995 and are hopeful that by the year 2000 the magnificent peregrine will be well established in the Michigan wilderness as well as several cities.

6/22/90

MANAGEMENT OF MICHIGAN'S STATE GAME AND WILDLIFE AREAS

Richard C. Elden
Michigan Department of Natural Resources
Wildlife Division
Box 30028, Lansing, Michigan 48909

Michigan has over six million acres of public land available for general outdoor recreation. This includes federal forest lands, state forest lands, federal wildlife refuges, state parks, recreation areas, and state game and wildlife areas. Most state lands are located in the northern two-thirds of the state. However, 80 percent of Michigan's nine million people live in the southern one-third of the state. This southern one-third is where the Michigan state game and wildlife areas are located.

The population of southern Michigan grew in the 1920s, 1930s, and 1940s as people moved to the industrial cities. The increase in population as well as an increase in leisure time developed a strong demand for public lands, particularly for public hunting in southern Michigan.

Fortunately for Michigan hunters, federal legislation was passed and implemented at the same time. The passage of the Pittman-Robertson (P-R) Act in 1938 accelerated our land acquisition, particularly in southern lower Michigan. Throughout the 1940s, 1950s, and the early 1960s, the State of Michigan had a strong P-R land acquisition program. The State acquired more than 250,000 acres in 57 units scattered throughout the southern one-third of the state. Most of the lands were dedicated as state game areas managed by the Game Division (now the Wildlife Division). After 1952, additional funds from the Dingell-Johnson (D-J) Act were used to acquire water access sites within or adjacent to game areas. These areas were designated as state wildlife areas, as both P-R and D-J funds were used for acquisition.

One of the primary objectives for the newly acquired state game and wildlife areas was the creation and maintenance of wetlands. The major objectives for the wetland areas are to provide stable breeding habitat, waterfowl migration habitat, and attract waterfowl for hunting. Several hundred drainages were blocked, creating waterfowl production impoundments from one-fifth of an acre to 200 acres in size. Most were small and

constructed without spillways or water control structures. Four major wetland units adjacent to the Great Lakes shoreline were developed with the use of dikes and water control structures. The largest developed wetland area was created by damming and diking the Shiawassee River.

Upland areas were dedicated to management and hunting of farmland wildlife species. Pheasants, rabbits, and squirrels were of primary concern. To help these species, fields with better soils were planted to grain crops, and lesser quality fields were managed for hay or grasslands. Only a few large management areas were dedicated for forest wildlife species, primarily grouse, woodcock, squirrel, and raccoon.

Over the past 50 years, the state game and wildlife areas and adjacent private land experienced land use and vegetative succession changes. Private farmland adjacent to the game and wildlife areas changed from dairy- or livestock-oriented agriculture to either large cash crop farms or reverted to brush lands. Much of the farmland was subdivided into residential development. The state lands converted to brush and forest lands. Pines that were planted to break up old fields or to create low evergreen cover grew into mature trees. Open fields became young woods. The areas were no longer suited for pheasants or farm game species management. Today, nearly all game areas are 70 percent or greater woody vegetation.

Increased use of off-road vehicles, horseback riding, and cross country skiing, especially by people living in nearby subdivisions, began to create user conflicts on these public lands. In 1973, State land use rules were adopted which restricted access to foot traffic only. Only specific areas are open to motorized activity. Activities that conflict with wildlife restoration or wildlife-oriented recreation are not allowed.

Historically, most funds to manage southern Michigan game and wildlife areas came from either Pittman-Robertson or the State Game and Fish Protection funds. These funds also acquired 95 percent of the lands within the state game and wildlife areas. State Game and Fish Protection Funds have been paid the $3 million "tax" bill (payments in lieu of taxes) to local units of government. The annual budget to operate these state lands is about $4

million. About $1.32 million is P-R, and the balance is General Game and Fish Protection Funds. The Wildlife Division also has a P-R income budget derived from the sale of forest products or sand-gravel and gas-oil leases, which amounts to $300,000 annually. These moneys are used for special maintenance needs, such as repairing parking lots, roads, trails, bridges, dikes, and dams.

The Wildlife Division also has $3.76 million of Recreation Bond moneys available over the next four years for much needed renovation and upgrading of the infra-structure on our state game and wildlife areas. Deterioration of the infra-structure has had a significant, adverse impact on wildlife-related, outdoor recreation. Recreation Bond funds will be used to restore water management control facilities; improve handicapper accessibility; and develop facilities for education and interpretation, parking lots, and water access.

The State game and wildlife areas are managed primarily for game species. In recent years, public interest in state game and wildlife areas has increased. More groups and individuals are expressing their desires to "help" the state in wildlife management on these areas. The Wildlife Division is now working with interested groups and citizens in the development of our management plans. Groups such as Ducks Unlimited, North American Waterfowl Alliance, Michigan Duck Hunters Association, Pheasants Forever, Wildlife Unlimited, Michigan Wildlife Habitat Foundation, Ruffed Grouse Society, National Turkey Federation, Michigan United Coon Hunters Association, The Nature Conservancy, Audubon Society, and numerous others have assisted in financing habitat development projects and land acquisition.

The addition of a Natural Heritage Section within the Wildlife Division is adding still another dimension in game area management. The Section is helping in the transition from target-species management to an ecosystem management approach. Likewise, computers are assisting in selecting management options. The computerized mapping, using cover-type identification and automatic cover-type updates, makes land management more comprehensive and easier.

Michigan has also been fortunate in developing a new land acquisition program. In 1986, Michigan voters established the Michigan Natural Resources Trust Fund with proceeds from Michigan's gas and oil extracted from state land. In recent years, the Natural Resources Trust Fund Board has approved purchases of key lands in the state game and wildlife areas. One purchase was the acquisition of 6,893 acres in Michigan's "Thumb," which created the Verona State Game Area. Others have been for major acquisitions within existing state game areas. Two significant purchases totaled 3,408 acres in one state game area. More importantly, in recent years the Natural Resources Trust Fund Board has approved $5 million annually to block-in ownership within the state game areas. Since 1985, more than 25,000 acres have been acquired. Put in perspective, this is two square miles larger than a township. (A township is 36 square miles.)

Paralleling the progress toward a computerized land management system was the development of a new set of land management guidelines based on Habitat Evaluation Procedures (HEP) produced by the United States Fish and Wildlife Service. Using habitat parameters from associated species, the Wildlife Division set up three general land management strategies. One strategy was developed for each of the three major cover types found in southern Michigan: farmland, forested cover, and wetland systems. In general, each land management unit (game or wildlife area) is identified to be managed as either farmland, forest, or wetland, based on present vegetation type and recreational opportunities.

The forest wildlife management strategy, which covers most of our areas, emphasizes successional timber types with oak and aspen as preferred types. Herbaceous openings are to be maintained on 10 to 15 percent of the area, and brush is to represent 20 to 25 percent of each unit. Therefore, 60 to 70 percent will be in forest stands. Stand sizes are to be one to ten acres in size. Cutting rotations are to be managed to produce a variety of timber age classes. All openings are bordered by a minimum of two chains of natural or planted brush species.

The farmland management strategy limits wooded tracts to 15 percent of the unit. These woods are to be five acres or less. The area immediately adjacent to the woods is to be maintained in a brushy condition at least two chains wide. Field sizes are not to exceed ten acres and will be at least three chains wide. Shrubs and brush will make up 20 to 40 percent of each farmland game area. Herbaceous cover will be 45 to 80 percent of the area. The herbaceous type will be in 20 percent permanent winter cover, 25 percent nesting-brood rearing cover, 50 to 55 percent idle fields, and 2 to 5 percent in annual agricultural grain crops for wildlife food.

The wetland management strategy is to combine brood rearing habitat, nesting habitat, and migration habitat for waterfowl and associated wetland species. Some flooded and non-flooded agricultural crops are planted in fields to attract waterfowl as a viewing spectacle and for hunting. Greater emphasis will be placed on management practices to attract greater year-round use by waterfowl and shorebirds.

Game area master plans are being prepared every five years using new computer mapping, planning, and record keeping capabilities, melded with our newly established management guidelines and strategies for southern Michigan wildlife. In addition, public information meetings and local input are incorporated into each individual master plan.

The southern Michigan game and wildlife areas are a unique, heavily used, intensively managed wildlife recreational resource that are easily accessible to great numbers of people. In the future, the goal is to make these lands even more productive for a variety of wildlife and a more enjoyable place for wildlife recreation without conflicting with the traditional wildlife recreation use that made these areas possible--hunting.

6/22/90

MIDWEST FISH AND WILDLIFE DIRECTOR'S MEETING

Tuesday, July 17, 1990

Recreational trail corridors, or linear parks, provide unique opportunities in expanding outdoor recreation activities in Michigan.

Travelways -- both terrestrial and aquatic -- have a long history of existence in the nation. Native Americans developed and utilized trails to meet the needs of human life and engage in commercial ventures. The settlement of remote areas and the industrial revolution was made possible through the construction of a system of railways frequently following trails utilized for pedestrian or equestrian travel. The appearance and subsequent mass production of the automobile has resulted in the construction of a system of roadways and highways linking almost each place of human habitation with one another.

Trails and pathways have also been developed exclusively for recreational purposes on publicly owned lands by those agencies responsible for natural resource management program objectives. Those agencies represent the federal government (U.S. Forest Service, National Park Service and U.S. Fish and Wildlife Service), the Michigan Department of Natural Resources, and local units of government including counties, townships, and municipalities. Private organizations, such as the Nature Conservancy and the Michigan Nature Association, also provide public trail facilities on lands under their ownership.

Trail related recreational activities include both motorized and nonmotorized uses. Dominant uses are snowmobiling, hiking, cross-country skiing, horseback riding, off-road vehicle riding, and bicycling. Linear parks also include opportunities for water-oriented recreational pursuits through the use of water courses -- primarily, rivers and streams -- as travelways.

Of particular relevance is the fact that linear parks serve as a linkage interconnecting residential areas to those lands managed specifically for recreational purposes. They frequently include river frontage in highly developed and densely populated urban areas in metropolitan regions of the state.

Trail use during winter months -- snowmobiling and cross-country skiing -- is an extremely important component in the tourism industry enjoyed by communities located in the northern portions of the state. In fact, many villages rely heavily on these types of winter outdoor recreation for their economic well being. Northern Michigan maintains the reputation as being one of the finest areas nationwide for these types of recreational pursuits.

The conversion of abandoned railroad rights-of-way to recreational trail uses continues to receive broad based support from the public. The maintenance of these corridors in public trust assures their long-term availability for use as utility corridors, future transportation needs (rail service or other), as well as recreational purposes. In numerous instances, local units of government have pursued the acquisition of rights-of-way for the inclusion of such properties into their respective recreation plans and programs. In addition, many miles of abandoned rights-of-way are utilized as snowmobile trails in the northern portion of Michigan.

Recreational trails, or linear parks, are truly a valuable natural resource and present a unique opportunity to diversify outdoor recreational experiences for Michigan residents and visitors to our state.

Therefore, management decisions of the Department shall be guided by the primary objective of enhancing and expanding trail-related opportunities and facilities for the long-term use and enjoyment of present, as well as, future generations. The purpose of this policy is to guide the operation and public land management activities of the Department of Natural Resources in recreational trails and linear park facilities.

The Department of Natural Resources recognizes that recreational trail corridors, facilities, and linear parks provide outstanding opportunities for diversified forms of outdoor recreation that are readily accessible to Michigan citizens.

It is vitally important to acquire and protect trail corridors and linear parks for present and future generations. In accord with the following policy statements, Department operations shall encourage the development of trail facilities and make every effort to manage, protect, enhance, and preserve their natural and physical character. In addition, the Department shall take all steps necessary to encourage the acquisition and development of trails by other units of government and the private sector.

The term "recreational trail" which is used in this policy means a travelway suitable for appropriate public use which serves as a linkage interconnecting points of destination. It may include an abandoned railroad right-of-way, a forest road, a body of water, river, or stream, a public roadway, a utility corridor, or a route of travel located on the surface of land administered by a public agency or a unit of government.

1. Acquisition and Disposal of Land.

A. Acquisition: The Department shall place a high priority on the acquisition of land, particularly abandoned railroad rights-of-way, including interests in land less than fee simple, for use as recreational trail corridors or linear parks. The factors listed in paragraph B, as well as offers and suggestions for acquisition, shall be used to determine the suitability of land for acquisition.

B. Offers and Suggestions for Acquisition: The Department shall consider all offers of land or suggestions for acquisition that may be utilized for recreational trail or linear park purposes. Land managing divisions, as well as those administering programs which affect or include recreational trails, shall be afforded the opportunity to review and comment on the proposed acquisitions prior to pursuing acquisition.

Factors to consider when reviewing acquisition shall include:

- potential as a recreational resource
- proximity to population centers
- proximity to other public owned land
- size and linear length
- threat of loss or development
- relevance or relationship to locally approved recreation plans
- extent of local/regional public support
- cultural and historical significance
- proximity to water features or environmentally sensitive ecosystems
- other factors as may be appropriate

For those parcels which exhibit several of the above factors, the Department shall pursue acquisition regardless of parcel size and geographical location, except where the director has recommended that acquisition should not be pursued. The Department shall also pursue the acquisition of interests in land including easements, leases, or ownership in less than fee simple for use as recreational trails.

C. Disposal: The Department may dispose of land by specific commission action only if one or more of the following criteria is met:

- It is demonstrated that the land in question does not exhibit the physical or natural qualities of a significant linear park or recreational trail and does not possess the potential to serve as an integral component in the statewide trails system.

- The land is not part of an integrated trail system and is too small to be effectively administered by the Department with little prospect for the expansion of public ownership or access in the future.

- The owner or lessee of the land will be a governmental unit which shall be capable of managing, administering, and protecting the land to an equal or greater degree than under Department administration.

- The Department finds that the requested use of the land is of such important value to public welfare that it exceeds the benefits derived from state ownership. Any decisions to dispose of land on the basis of this criteria shall be made only after opportunities for public comment.

Where the Department has initiated the proposal for the disposal of land exhibiting qualities as a recreational trail or linear park, it shall be required that the land be offered first to a governmental agency, unit of government, or nonprofit organization which will accept conveyance conditions which will protect the physical and public use values of the land.

In considering proposals to dispose of such lands and assemblages of acreage, the purpose and intent of this policy shall be recognized, as well as the commission's responsibility to protect, manage, and maintain recreational trail corridors.

2. Management of Linear Parks and Recreational Trails.

A. Division Procedures and Standards: All division procedures and management standards for state owned lands or interests in lands exhibiting the characteristics or qualities as linear parks or recreational trail corridors shall be developed or revised to be consistent with this policy.

B. Management Objectives: In establishing management objectives for state owned or controlled lands exhibiting qualities as recreational trails or linear parks, the Department shall recognize a wide range of purposes for maintaining these lands in public ownership. The purposes may vary or range from the maintenance of the corridor for high quality hiking and backpacking wilderness recreation with strict limitations on any disruption, to the provision of opportunities for intensive recreational activities such as off-road recreational vehicle use. The management objectives for recreational trails and the corresponding intensity of use shall be established on the principle of multiple use wherever possible. The Department shall strive to accommodate as many types of trail-use activities within a recreational trail corridor (both motorized and non-motorized) to the extent that the primary goal of maintaining the corridor is preserved as well as provisions for public health, safety, and welfare. Decisions on amount of significant use, both quantitatively and qualitatively, shall be based on criteria developed by Department staff and approved by the Natural Resources Commission.

C. Management Plans: Lands designated or dedicated as linear parks or recreational trail corridors shall be developed, administered, and managed in accordance with a specific management plan prepared by the Department and approved by the Natural Resources Commission. The plan shall establish the management objectives for the recreational trail corridor; the values both natural and social

which are being maximized or protected through the management objectives; development plans for the corridor, including maps depicting facility locations; and construction and use guidelines. The plan shall be developed with formal opportunity for participation by other divisions in the Department, affected governmental agencies and local units of government, and citizens.

D. Motorized and Nonmotorized uses: Conflicts between motorized and nonmotorized user groups within a recreational trail corridor or linear park frequently occur. In some instances, public safety concerns may require a primary single-purpose use during a seasonal period of time. In other instances, conflicts may be of a social or aesthetic nature necessitating the implementation of certain management or administrative action to assure the preservations of a quality-type outdoor recreational experience. To the extent possible, shared use of recreational trail corridors shall be pursued and encouraged. Individual trail management plans shall be prepared, and approved, in those instances where conditions justify such actions. Department staff shall utilize the broadest range of innovative management techniques in accommodating as many types as user groups as possible within a trail corridor. The "mountain" or "all-terrain" bicycle does present a likelihood of conflicts of use with other trail user groups during periods of high trail use. Instances of this nature necessitate special management and trail design considerations toward minimizing these conflicts.

E. Competitive Events: Organized competitive events contemplated on public recreational trail corridors may be accommodated with advance written approval of the appropriate land managing division. The Department shall inform the general public as to the dates, location, and nature of the competitive event, including the posting of informational signs, prior to the event in minimizing conflicts of use.

3. Department Administered Grants, Financial Assistance, and Revenue Matters:

The Department administers a number of financial assistance programs which provide revenues to local units of government, agencies and organizations for a broad variety of activities related to recreational program purposes. The activities include land acquisition and development programs. The activities enabled by grants and other financial assistance can have direct and indirect effects on recreational trails or linear parks.

Consistent with the applicable statutes, grants and other financial assistance awarded by the Department the enhancement and expansion of the trails program as referenced in this policy shall recognize recreational trails and linear parks as a priority objective for funding consideration. Funding of the operational and administrative responsibilities directly related to recreational trails and linear parks must be addressed and resolved to assure the long-term viability and success of this important program objective. Trail user fees and registration fees support, in part, this program objective. Other means of resolving this problem must be addressed. The Department shall interact with trail user groups toward the development of the alternatives available in remedying this situation, including new or amendatory legislation. This goal shall receive priority consideration.

4. Snowmobiling:

The snowmobile has impacted outdoor recreational opportunities in Michigan to a most significant degree. Many communities in the northern portion of the state enjoy employment opportunities and economic gains of major proportions that are directly related to the snowmobile industry. Michigan does have the potential to offer opportunities for the finest system of snowmobile trails in the United States. Therefore, the Department shall recognize snowmobiling as a priority program objective and shall place emphasis on maintaining these types of trails at a standard of highest quality through grooming and other appropriate practices.

5. Research, Education, Technical Assistance and Information Dissemination:

The Department shall actively pursue opportunities for research and special studies into the environmental or recreational qualities of linear parks or trail corridors which has application to recreation programs, technical assistance, land and user management plans, and decisions on acquisition or disposal.

Through the diverse programs offered by the Department, opportunities shall be identified and exercised to implement educational programs and publications concerning recreational trail corridors.

The Department shall identify and publicize a source of technical assistance where government agencies, local units of government, and citizens may receive advice concerning recreational trails which may include construction standards, signing, management techniques, and other relevant subjects.

6. Commission Policies:

The Department shall review all Commission policies which affect recreational trail corridors or linear parks and recommend revisions to the Commission which are necessary for consistency with this policy.

TRAILS MANAGEMENT AND FUNDING

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3. Recreation trends in the 1950's and 60's
4. Appearance and production of the snowmobile

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3. Planning initiatives of the DNR
   a. expansion of the outdoor education/interpretive program
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4. The trails program
   a. consolidation of trail functions within the Recreation Division.
   b. establishment of the recreation improvement fund

c. rails-to-trails conservancy

d. ORV program for southeast Michigan

e. ORV trails on state forest lands

f. new linear parks established

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h. ATB (mountain bicycles) grow in popularity

i. commitment to the preparation of a statewide trails plan

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5. Urban outreach initiatives
6. Communications - multi-media (maps, videos, publications, etc.)
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8. A Michigan trails manual
9. Funding - operation and development
10. New legislation
11. Economic impacts
12. Technical assistance

MANAGEMENT ISSUES OF THE GREAT LAKES

J. D. Snyder, Moderator
Director, Office of the Great Lakes
Michigan Department of Natural Resources
P.O. Box 30028
Lansing, Michigan 48909

Great Lakes Areas of Concern.....Diana Klemans
Surface Water Quality Division

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- B. IJC
- C. GLWQA - 1972
- D. 1973 problem areas
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Nonpoint Source.....Deb Allen
Surface Water Quality Division

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Air Quality Division

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A. Great Lakes governors' toxic substances control agreement

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IV. 1990 Priorities - Great Lakes Air Toxics Action Plan

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D. Amendments to the federal clean air act to incorporate Great Lakes protection measures

Watershed Management in Michigan: Challenges and Opportunities

Joseph R. Sylvester
Michigan Department of Natural Resources
Fisheries Division
Lansing, Michigan 48909

A watershed can be simply defined as a land area drained by a river or river systems. The Michigan Department of Natural Resources (MDNR) has identified 297 watersheds statewide that merit special consideration and attention.

Michigan's water resources are of immense value to the state's citizens. Over the years significant progress has been made in improving water quality in the Great Lakes, inland lakes and streams. Resolution of problems associated with water quality and land use, although continuing, is becoming more complex. To effectively address these challenges, Michigan will redefine its basic policy framework for water quality management towards a watershed basic formula.

The watershed has been advocated as the logical unit for comprehensive water and land management in Michigan due to several factors. The quantity and quality of water depend upon how it moves over the land, through the soil and into streams, lakes and ground water reservoirs. Water is also affected by its use for industry, agriculture and the public water supply. Managing these resources on a watershed basis is the most effective and efficient means of integrating water quality and water quantity concerns.

Watershed management is also the most logical approach for pollution prevention, water supply management, and particularly for fisheries recreation management.

Watershed Management Techniques

A variety of water and agricultural management practices can be used to protect water quality (Table 1). Best management practices (BMPs) are procedures that can be used by landowners, farmers and others to limit or eliminate sources of pollution entering a particular water body.

Agricultural BMPs may include vegetation strips, conservation tillage, contour plowing, fertilizer management and animal waste management.

Water resource BMPs include stormwater runoff management, comprehensive or master land use planning, septic maintenance and wetlands management.

MDNR Goal of Watershed Management

The goal of the Department's water management initiative is the protection and support of multiple uses of public waters in an equitable manner across political boundaries. Watershed management is an ongoing dynamic process involving management of surface water, ground water and wetlands. Department programs which impact water quality, development of recreational opportunities, and fish/game management are coordinated to achieve mutual goals and to avoid duplication of effort.

Integrated Watershed Management

Integrated watershed management can be clearly demonstrated in two areas of management concern: fisheries and recreation.

Fisheries management, in streams and reservoirs, involves watersheds in two respects: fish move around and within watersheds, and fish habitat features at any place in a watershed are largely determined by conditions upstream. Consequently, most fisheries management activities should be carried out within a watershed context.

Fishery managers can do little to maintain good fish populations if fish cannot survive and grow well. Because fish live in such intimate contact with water, there is considerable exchange of constituents between the water and the fish. These exchanges include oxygen and other gasses, and a wide variety of dissolved ions and chemicals. Fish growth and survival depend greatly on water quality. Water quality in a lake or any part of a stream is largely determined by what flows in from upstream.

Fish populations are generally proportional to the low flows in a stream. If a given volume of water is to flow through a stream over a year, a more stable pattern of flow will

support larger and more desirable fish populations. The pattern of flow in a stream is influenced by land use and water management upstream. land managers influence the amount of water which percolates into groundwater or runs off on the surface during rainfall. Wetlands are important in the recharge of groundwater from surface runoff. Dam operations, especially for hydropower, induce flow fluctuations. Drains are managed to move water downstream as rapidly as possible and thereby increase the variation in stream flow.

Recreation has become increasingly focussed on water resources in Michigan. The state has some 7,500 inland lakes of five acres or more; some 5,000 artificial lakes, pond and reservoirs; and over 36,000 miles of rivers and streams (Figure 1). These resources are used by anglers, boaters and canoeists. They are important features for campers and cottage owners or renters. In urban areas, they are the focus of many parks and public spaces.

By managing water resources throughout a watershed, the potential for improved recreational opportunities will be significant. Maintaining high quality waters will insure that streams an lakes meet recreational and tourism needs. This, in turn, will improve both the economic base and the quality of life for the citizens of the state.

MDNR Initiatives

The Department is currently involved in a number of watershed initiatives:

The National Pollution Discharge Elimination Systems Permits are being converted to issuance along a watershed basis.

The joint evaluation of facilities along a stream makes it possible to track water quality effects and make appropriate permit restrictions throughout the whole river basin.

New water quality standards now require watershed studies to determine the total pollutant loadings as they affect dissolved oxygen levels.

The Department's nonpoint source pollution control strategy recognizes and recommends implementation of nonpoint programs on a watershed basis. During this fiscal

year the Department twill focus its efforts on three demonstration watersheds, developing appropriate plans and implementation strategies.

The Clean Water Incentives Program for urban areas has been reinstituted in this fiscal year. Funding will be provided for implementation of clean water incentive grants as part of a Great Lakes initiative.

The Natural Rivers Program provides for the development of natural river management plans and the adoption of local and state zoning ordinances to protect the natural rivers system.

The Michigan Clean Water Strategy adopted by the Natural Resources Commission establishes an important agenda for pollution prevention and improving water quality. The strategy includes recommendations in five key policy areas including watershed management.

Other Agency Initiatives

There are also a number of initiatives outside of the Department based upon watershed boundaries: The Michigan Department of Agriculture analyzes drainage projects on a watershed basis. They also are implementing the rural clean water incentives program on a watershed basis.

The U. S. Soil Conservation Service (SCS) has over the years been involved with watershed studies and improvements. The SCS is currently implementing a watershed plan for the Elk River watershed. There is currently a major study of northwest lower Michigan river basins, particularly directed toward water quality concerns.

Grand Valley State University Water Resources Institute was awarded a one million dollar grant from the Grand Rapids Foundation to undertake a watershed project for the Grand River. This project will emphasize the importance of watershed information to increase public awareness of the watershed management process. This project will also develop procedures to integrate geographic information system technology into Grand River watershed management.

Grants under the 205(j)1 of the Clean Water Act have been provided for watershed studies at the substate level. These include efforts on the Clinton, Elk and St. Joe rivers.

The Watershed Challenge

Since watershed boundaries do not correspond to political boundaries, it has been a challenge to implement watershed management programs (Table 2 at the local level, governments have had few incentives to consider the effects of their development beyond their immediate jurisdiction. Yet they are influenced by the actions of every community upstream, and in turn, their actions affect every community downstream. Too often, the results have been increased flooding, erosion, and degraded water quality from nonpoint source pollution and combined sewer overflows (Grand Rapids and Clinton River watersheds are examples).

At the state level, watershed management has also been a difficult challenge. There have been a number of initiatives over the years. However, we have yet to effectively focus the wide range of technical and management tools at our disposal toward integrated watershed management. To implement a successful program within the Department will require the coordination of several divisions - including Fisheries, Land and Water Management, Surface Water Quality, and Office of Water Management. Other state departments such as Agriculture and Public Health will clearly need to be involved.

Table 1. Selected watershed management techniques and remedial actions.

Technique	Application	Procedure
Vegetation strips	Agriculture and construction	Plant grass, shrubs and trees in strips between fields, ditches or streams.
Conservation tillage	Agriculture	Stalks and stems are left on fields as mulch.
Contour plowing	Agriculture	Furrows are plowed across the slope of land.
Contour strip cropping	Agriculture	Permanent crops are alternated with shorter season crops.
Integrated pest management	Agriculture and residential	Verifies problems of pest infestations before chemical.
Fertilizer management	Agriculture and residential	Controls amount and timing of application based on soil testing.
Animal waste management	Agriculture and other	Animal wastes are placed in animal husbandry treatment tanks or ponds prior to discharge.
Livestock exclusion	Agriculture	Fencing of streams and ditches to prevent animal entry.
Stormwater management	Residential and urban areas	Filtering stormwater, reduction of hard surfaces, maintaining wetlands, construction of retention basins.
Comprehensive planning	Residential and urban areas	Regulating land use, establish and zoning subdivision standards, develop improvement programs.

Table 2. Partial list of federal, state, and substate agencies with watershed management and protective responsibilities.

Federal

U. S. Forest Service
U. S. Park Service
U. S. Fish and Wildlife Service
U. S. Geological Survey
U. S. Department of Agriculture
U. S. Corps of Engineers

State

County Soil Conservation Districts
Department of Natural Resources
Department of Agriculture
Department of Public Health
Department of Transportation
Department of Management and Budget
Department of Environmental Quality
Michigan Environmental Council

Substate

Association of County Drain Commissioners
Michigan Council of Governments
Michigan Municipal League
Michigan Townships Association
Michigan Association of Counties
County Health Departments
County Road Commissions
County Department of Public Works
County Planning Agencies
Local Fire Departments
Watershed Councils
Regional Planning Agencies
Various Townships, Villages, and Cities

Potential Funding Sources

Clean Water Act
EPA Clean Lakes Program
Great Lakes Protection Fund
Great Lakes Protection Fund

The F.E.R.C. Licensing Process

Walter C. Houghton
Michigan Department of Natural Resources
Fisheries Division
Lansing, Michigan 48909

The Federal Energy Regulatory Commission (FERC) has regulatory control over all hydroelectric facilities and their operation which impact interstate trade, contain reservoirs in excess of 2,000 acres, utilize surplus water or water power from a federal dam, occupy federal lands, or are located on navigable rivers. The Michigan Department of Natural Resources (MDNR) has some jurisdiction and considerable management responsibility on rivers that have hydroelectric facilities located on them. Hydro facilities impact both the riverine environment and the aquatic ecosystem which, in turn, limits our management options on these watersheds. The MDNR's role, as a state resource agency, is to: 1) recommend data needs to evaluate these facilities; 2) recommend the needed mitigation for impacts; and 3) recommend license conditions for each project. FERC, as the regulatory authority, is the ultimate decision maker in this process.

There are 113 hydro facilities operating in the State of Michigan. They impact 49 river systems which includes almost every major river in the state. They directly impound 467 river miles and impact, through their operation, 733 river miles. Reservoir area created by these facilities is approximately 123,000 acres. These facilities produce, in net, 1.5% of the electricity in the State of Michigan.

This is a critical time period as over the next 5 years 30 facilities will be relicensed and 26 facilities will be licensed for the first time. This licensing will be conducted in a regulatory climate where environmental concerns are treated equally to power production. Decisions made now will impact many of Michigan's most important fisheries for at least 30 years.

HYDROELECTRIC IMPACTS

Hydroelectric dams impact river systems in seven major areas. The Michigan Department of Natural Resources has the following objectives in regards to hydroelectric impacts.

Project Operation

a. To operate all facilities with riverine tailwaters in a run-of-the-river mode which creates near natural river conditions.

b. To operate all facilities with reservoir tailwaters in a fashion that minimizes both tailwater and headwater fluctuations to gain a stable lake-like condition.

c. To provide adequate flows to protect and maintain aquatic resources in diverted or bypassed river channels.

Fish Passage

To provide fish passage for both anadromous and resident fish around hydroelectric facilities as determined necessary for the appropriate management of the river. The department also will recommend license articles to install fish passage at projects if deemed necessary in the future.

Fish Entrainment and Mortality

To minimize and mitigate for the loss of fish at every hydroelectric facility from either turbine or spillway passage. Protective devices will be installed and/or studies will be conducted at each facility.

Water Quality

To minimize water quality impacts from hydroelectric development. Water quality studies will be conducted at all facilities prior to granting a Section 401 certification which guarantees that state water quality standards will be met by each facility.

Recreation

To optimize the utilization of hydroelectric facilities for recreation by securing assured public access and appropriate facilities on all waters impacted by hydro which support or have the potential to support public fisheries and aquatic recreation.

Terrestrial Management

To minimize and mitigate the impact of hydroelectric development on wildlife species and to optimize the terrestrial management of all project lands for wildlife.

THE F.E.R.C. LICENSING PROCESS

Hydroelectric facilities have a wide range of important impacts for our state. Almost all our facilities were constructed before 1954 in a social climate where environmental impacts of their activities was not considered. Presently we have the opportunity to address this oversight and change, if necessary, the operation of these facilities and their lands to meet natural resources needs for the next 30-50 years.

The FERC has regulatory control of the hydropower industry under the Federal Power Act. The licensing process consultation is conducted in conjunction with other resource agencies such a the U.S. Fish and Wildlife Service and the U. S. Forest Service. Our role as an agency is to recommend license conditions, based on a combination of existing and data collected from our recommended studies, that will ensure that the resources of the state are protected. The present regulatory climate, where power and non-power interests are considered equally, has greatly enhanced our role.

The FERC licensing process is a three stage consultation process which will take five years for relicensing projects and 1.5 years for new license. this is a mandatory consultation process with the resource agencies and general public involved. The process for all relicensing projects started in December, 1988, and will end in December, 1993. The following outlines the FERC licensing process.

State One.--This is the initial consultation stage which begins with the distribution of the initial consultation package (I.C.P.) which is a summary of the project's engineering data, environmental data and proposed mitigation. During this stage, MDNR and other resource agency concerns and project study and data needs are identified.

Stage Two.--This is the data gathering and license application preparation stage. During this phase, study designs are determined, data collected, and the draft application and study data is reviewed by the agencies. Once FERC accepts an application, stage 3 is initiated.

Stage Three.--This stage consists of the evaluation by FERC of the application and the determination of license articles that will govern the operation of the facility. After the application is accepted, it is public noticed for 60 days. During this 60 day period, agencies and the pubic make their final recommendations for license conditions. All interventions, which make the intervenor a formal party to all additional actions, must be filed in this time period.

The FERC, during this time, write the necessary environmental assessment or environmental impact statement, determines necessary mitigative measures and writes and issues the license by December, 1993.

In summary, the FERC licensing process provides a historic opportunity to safeguard, through our recommendations and input, the aquatic environment of 24 river systems for the next 30-50 years.

Warmwater River Research in Michigan

Paul W. Seelbach
Michigan Department of Natural Resources
Institute for Fisheries Research
212 Museums Annex Building
Ann Arbor, Michigan 48109-1084

Michigan contains a large number of warmwater rivers which traverse a variety of geologic and climatic regions and contain a wide variety of fish species. Michigan's warmwater rivers have historically been ignored by fishery biologists. These rivers did not have the appeal of coldwater trout streams; in addition, many were seriously degraded by human activities following early settlement of the state. The federal clean water legislation of the 1970s has resulted in substantial improvements in the water quality of many of the more degraded rivers and warmwater rivers currently present a large, untapped resource for fishery development. Many of the state's southern warmwater rivers provide potential for developing fisheries near the large population centers of southern Michigan, Indiana, and Illinois. Today the considerable recreational potential of these rivers is recognized by management agencies and public alike.

During the past few years, fisheries management activities on warmwater streams have increased dramatically both in Michigan and throughout the midwest. During this period Michigan began its warmwater river research program. Last year, we also began a large watershed management initiative which includes several warmwater rivers. The Federal Energy Regulatory Commission's (FERC) hydropower relicensing program has generated fisheries research activity on nearly all of our major warmwater streams and rivers. The American Fisheries Society (AFS), North Central Division (13 states and provinces) has formed an active rivers and streams committee which focuses largely on warmwater rivers (this committee has greatly increased interstate actions). The AFS Michigan Chapter also now has an active rivers and streams committee.

The first step in our research program is to inventory our warmwater river fish resources and classify them into meaningful groups. Inventory is needed to describe and document aquatic community makeup and population characteristics of major species. Classification will organize the data into a logical, functional framework which will: (1) allow

extrapolation of knowledge to unstudied areas; (2) aid planning and decision-making processes; (3) provide a description of a given area's fishery potential based on proven relationships between physical conditions and fish communities; and (4) aid identification of local management opportunities. Finally, community structure in rivers is believed to be shaped to a large degree by limitations imposed by the physical environment. Investigation of the relationships between community groupings and associated physical habitat characteristics will provide an initial test of the importance of these in defining community structure.

We are midway through an inventory of the physical and fish community characteristics of our major warmwater (and coolwater) river systems. We are developing a database at 250 sites on 21 river systems. Data on physical characteristics is being collected at both the watershed and local scale. Fish communities are being sampled with rotenone (a fish toxicant) applied to a 700-foot stretch of river. The rotenone is then detoxified with potassium permanganate. Rotenone sampling is by far the best method available for sampling these often large and turbid rivers; rotenone yields excellent data on species presence, and is the only way to obtain estimates of relative abundance, size and age structure, and standing crop. Summarizing to date, the sample data fish are abundant and diverse (30 species per site is typical); fish communities vary from site to site; and good populations of game fish such as smallmouth bass, rock bass, northern pike, walleye, channel catfish, and flathead catfish are found at many sites. Key habitat variables influencing community structure appear to be the relative importance of groundwater to stream flow, stream size, and stream gradient.

In order to calibrate rotenone sample data collected under a variety of conditions, we have been conducting a study of the efficiency of the sampling technique. This involves capturing fish by electrofishing, marking them, and releasing them into the sampling site prior to rotenone application. The proportion of marked fish recovered is a measure of sampling efficiency. We have done efficiency estimates at 40 sites to date. Efficiency is almost never 100%, as was previously assumed; it is typically 30% for sunfish and bass, and 90% for suckers. Efficiency varies with species, size, turbidity, and velocity.

The smallmouth bass is the most abundant and widespread game fish in our warmwater rivers. We have begun to develop long-term databases on smallmouth bass populations and their associated fisheries in three rivers: the Huron (6th year), the Shiawassee (3rd year), and the Clinton (3rd year). We are estimating the size of the populations each fall by electrofishing. We are estimating the catch and fishing pressure each summer with a creel

census. Our aim is to: (1) collect baseline data on these rivers for 3-5 years; (2) implement some management action (such as special regulations or habitat improvement) to try and improve the smallmouth population; and (3) collect follow-up data for an additional 3-5 years to evaluate bass population and fishery responses to our action. Five years of baseline data on the Huron River show that it contains abundant small smallmouth bass but few over legal size (12 inches). Fishing pressure and exploitation rates are very high (exploitation rate is near 100% for legal-sized bass). A catch-and-release regulation was first implemented last summer and was very popular.

Suckers make up the major portion of the fish biomass in our warmwater rivers. We know little about the ecology of these abundant and diverse (there are nine species) fish. We are conducting a study of the habitat and diet preferences of suckers and smallmouth bass in two contrasting rivers. This information will help us understand how these fishes fit into river fish communities and whether they compete for space or food with smallmouth bass. Improved understanding of the ecology of individual sucker species will also aid in our use of these fishes as indicators of habitat quality.

The withdrawal of water from streams, primarily for agricultural irrigation, is rapidly increasing in southern Michigan. The percentage of agricultural acreage under irrigation in Michigan increased fourfold from 1970 to 1980 and is expected to double during the 1980s. A study of consumptive water uses in the River Raisin watershed found that, under summer drought conditions, current levels of withdrawal for irrigation reduce flow from a normal 10 cubic feet per second (cfs) to approximately 1 cfs. We are concerned that flow reductions will harm fish populations and reduce the river's potential for recreation. We are beginning an experimental study of the effects of flow reductions on the behavior of smallmouth bass. The study will be conducted in the bypass channel of an old mill where stream flow can be controlled. We will monitor changes in the behavior of bass as flow is varied, and examine how these changes may influence bass standing crop, growth, and survival. Water withdrawal from trout streams is also a concern, and we are currently examining the effects of water withdrawal on a brook trout population by diverting water around a portion of a stream, and following the responses of the population.

Negative Effects of Sediment on Streams and their Fish Populations: Corrective Measures that Mitigate these Effects

Gaylord R. Alexander
Hunt Creek Fisheries Station
Route 2, Box 2299
Lewiston, Michigan 49756

Sedimentation is the biggest pollution problem facing fish in northern Michigan streams. This is probably true for most streams in the mid-western states. Sediment is soil and detrital material that gets into our water courses. I will be talking today mostly about research findings from sediment experiments on trout streams in Michigan, but the results, I believe, apply generally to all streams and to fish communities other than trout.

Stream sediments may be classified into two types: (1) suspended and (2) bed load. Suspended sediments are particles that are carried by the stream throughout the water column. These particles are very small (less than 0.062 mm). In Michigan streams these particles are typically clay or silt size.

Bed load is composed of soil particles carried in close proximity to the stream bottom. These particles bounce, tumble, and slide along the stream bottom as they are transported downstream. Bed load is usually composed of particles of sand size, but at higher water velocities may be composed of gravel or even cobble.

Sources of sediment are numerous: streambank cutting, road crossings, agricultural activities, urbanization, construction sites, forest cutting activities, geological sheet erosion, or any land disturbance. In addition to new sediment inputs, much sand sediment is presently in storage in the channels of our larger streams of Michigan as a result of logging activities that caused major erosion in the late 1800's and early 1900's.

How can sediment problems be detected? Turbid, dirty water indicates a high suspended sediment load. However, the presence of sand bed load is deceiving because it does not produce the turbidity lay-persons commonly associate with severe stream sedimentation. Even substantial amounts of moving sand bed load are not readily apparent, particularly in steep-gradient streams. Only when the gradient is low enough for deposition does the sediment become evident by the presence of sand-filled stretches of the stream. In low gradient stretches of stream, high bed load is evident when duning or rippling is present on the sandy stream bottoms. The amount of bed load being carried by a stream is subtle.

For example, the Pine River, a branch of the Manistee River, Wexford County, dumps over 50,000 tons of sand in Tippy Dam impoundment each year. The Pine River is a relatively clear trout stream.

It is possible to measure sediment quantitatively by sampling over sills or weirs with a DH-48 sampler. Sediment load can also be measured by calculating the filling rate of sediment traps.

What does sediment do to streams? Suspended sediments have little measurable effect on stream channel morphometry. However, bed load has a profound effect on stream channel form and fish habitat. Inputs of bed load material will fill pools and have the overall effect of leveling and smoothing the channel. Because of deposition the stream bottom will elevate, causing the water surface to elevate. This, in turn, causes the stream to become wider and shallower.

During the process of channel filling much fish cover is lost. Rough bottom types, like cobble and gravel, will be buried. Further, because of the smoothing of the bottom and a more uniform channel form, water velocity will increase because of less drag or friction. This also results in a smaller cross-sectional area of water. This means less static water volume and living space for fish. The stream is also transformed from a riffle-pool sequence to a continuous run. In contrast to the above, if stream-bed load sediments are eliminated, either from lack of new erosion inputs or trapping of sediments already in the channel, the above stated process will be reversed.

Sediments have a negative effect on most plants and animals that live in streams. Suspended sediments reduce light penetration thus reducing plant production. Bed load sediments abrade (sand blasts) plants and many times buries plant beds.

Invertebrate populations (insects, mollusks, crustacea, etc.) the food supply of fish, are harmed by sediment directly by particles bombarding and abrading them. Further and even more devastating is that sediment buries their habitat by filling in the interstices and pore crevices between gravel and rocks. Further, a continually moving sand bottom does not provide the good substrate for attachment or burrowing that is required by many invertebrate forms.

What are the effects on fish population? Michigan has done two intensive studies measuring the effects of bed load sediment on trout. One study at Hunt Creek, Montmorency County, showed that an increase in bed load from 20 ppm to 80 ppm depressed the population to less than half its normal level. Sand bed load concentrations of 80 ppm are

common in northern Michigan trout streams. This study further demonstrated that reduction of the bed load back to the original level, permitted the stock of trout to recover to previous population levels, although the recovery took nearly 6 years for 1 mile of stream.

The other sediment study involved installing a sediment trap in Poplar Creek, Wexford County, thereby reducing bed load from 60 ppm to 10 ppm. This resulted in a trout population increase of about 40%.

Bed load sediment reduces cover for all age classes of fish. For example, pool filling adversely affects habitat of older fish, and edge filling eliminates the small backwater niches required as nursery areas for young fish. The shallower water and lack of cover increases predation on fish. A smooth bottom results in higher velocities and more laminar flow which forces fish to exert more energy to maintain position in the stream. Sand that sifts over and caps spawning beds can result in the entrapment of newly hatched young. Moving sand reduces the food production within a stream.

Preventing sediments from entering streams is the best corrective measure. The "Best Management Practices" (BMP) should be used for controlling soil erosion. The Surface Water Quality Division has compiled a report of BMP. For stabilizing eroding streambanks, heavy rock rip-rapping is the best in the long run. Road crossings of streams should be designed so that water leaves the road surface without eroding grades and ditches. Water should be removed from the road before it concentrates into a large volume that goes directly into the stream. Agriculturists need to reduce soil losses from tilling fields, cattle grazing, and other practices which cause erosion. Permanent vegetation-filter strips (green belts) should be established along all streams and drainage ditches. Storm-water sewers and drains from urban areas should have sediment traps installed in the new systems and they should be maintained properly. Erosion control should be practiced at all sites of land disturbances, developments, and construction sites as mentioned earlier.

Many large streams have sediment in storage from past periods of heavy sedimentation. The use of in-stream sediment traps can be used today to eliminate this load. Unfortunately, the cost is high and many years are required to do the job.

Sediment traps are excavations (holes) dug into the stream bottom. The effect of the excavation is an increase in the stream cross-sectional area, thus average water velocity is reduced and soil particles drop and are deposited in the holes. When the trap is nearly filled it must be emptied (dug out).

Research in Michigan indicates that sediment reduction in trout streams has the potential to increase trout stocks by 50% on the average. This would be a substantial addition to a very valuable resource, and worth the cost.

Operational Waste Management in Aquaculture Effluents

Harry Westers
Fisheries Division
Michigan Department of Natural Resources
Lansing, MI 48909

ABSTRACT

Effective solid waste management can do much to improve the effluent quality of fish farming operations. The State of Michigan uses baffles in linear, rectangular rearing units to induce a high water velocity of 20 to 30 cm s^{-1} along the bottom to continuously sweep solids to a fish free section at the foot of the rearing unit. As solids accumulate they are removed as scheduled. This approach can accomplish a reasonable effective and efficient management of solid waste, with an estimated 70 to 80 percent interception and removal of such waste. Frequent removal further lowers the phosphorus and nitrogenous waste in the effluent. This low tech approach requires relatively high water flow rates through the rearing units, which in turn, results in fish densities of 90 to 150 kg m^{-3}. It appears that most salmonid species adapt well to both baffles and high rearing densities.

INTRODUCTION

The need to manage solid wastes, generated by fish culture activities, was recognized in the 1970s (Liao 1970) but it seems that most farms continued to operate without any effluent treatment through this, as well as the next decade. In a 1980 survey, only 17 percent of the freshwater farms in the UK treated their effluent to remove solids, which, in almost every case, was by means of settling ponds (Solbe 1981). A 1988 survey conducted in Ontario, Canada, revealed that only 26 percent of the farms treated their effluent, also primarily by means of settling ponds (UMA-Eng. 1988).

Most often such solid waste accumulates for long periods of time where the settling pond receives the continuous flow from the farm. This approach to treating farm effluents does little or nothing to prevent nutrients from leaching and escaping, although it does

prevent the unsightly as well as damaging effects of physical solids in the receiving water immediately below the farm's outfall.

In the 1990s, concerns about environmental impacts of fish farm will intensify, also in light of the projected increase of aquaculture activities. Such concerns will go beyond the cursory approach to the settling of solids. In particular, the nutrient phosphorus will be targeted (Westers 1990). However, phosphorus, once in solution in fish farm effluents, cannot be treated economically due to the extremely low concentrations. Fortunately, 50 to 80 percent is excreted via feces, thus rapid interception and removal of solids, before significant leaching occurs, can do much to reduce phosphorus in the effluent. The other major approach is through reduced phosphorus levels in the feed (Ketola et al. 1988).

The State of Michigan has applied a low tech approach to solid waste management that has proven to be quite effective.

DESIGN AND OPERATIONAL MODE

Michigan's fish production facilities are designed for, and operate on, relatively high volumes of water through rectangular, concrete tanks and raceways. Up to 10 species of salmonids are routinely produced, ranging in size from 8.0 cm for chinook salmon (*Oncorhynchus tshawytscha*) smolt to 20 cm for steelhead (*O. mykiss*) and Atlantic salmon (*Salmo salar*) smolt. Rearing densities commonly reach 80 kg m^{-3} and at times go up to 150 kg m^{-3}. Loadings, however, seldom exceed 2.0 kg liters min^{-1}. Supplemental oxygen is used to control nitrogen gas levels, while simultaneously maintaining dissolved oxygen levels well within optimum ranges (Westers, 1989).

Tanks and raceways have an approximate width to length ratio of 1 to 10 and a water depth ranging from .5 to .8 m. Most of these units operate at flows which result in water exchange rates once every 10 to 15 minutes. The resulting velocities are from 2.0 to 4.0 cm s^{-1}. These are determined by means of equation (1).

$$Vr = \frac{Lcm \times Eh}{3600} \qquad (1)$$

Where: Vr is the velocity in cm s^{-1} in the rearing unit.
Lcm is the length of the rearing unit in cm,
Eh is the number of water exchanges per hour,
3600 is the number of seconds per hour.

These velocities are sufficiently low to settle solids rapidly to the bottom. Feces of 5.0 cm trout settle at a rate of 1.5 cm s^{-1}, while those of adult trout have a settling velocity of 5.0 cm s^{-1} (Warren-Hansen, 1982). Once at the bottom, the particles are moved along by a gentle current of water created by means of baffles placed throughout the rearing unit as illustrated in Figure 1. After they pass through the fish retaining barrier at the foot of the pond, they rapidly settle and accumulate undisturbed. Velocities of 15 to 20 cm s^{-1} are sufficient to make circular tanks self-cleaning (Makinen et al. 1988). The baffles are set to create velocities up to 30 cm s^{-1}. The key is to prevent fish from repeatedly resuspending solids since the settling velocity of broken feces is much slower. Resuspension also causes the degradation of the "in-pond" rearing environment along with increased pollution of the receiving water through escapement of suspended solids and leached nutrients.

The space between the baffle's edge and the bottom of the rearing unit determines the velocity. This gap can be selected by means of equation (2).

$$G = \frac{Vr}{Vb} \times H \qquad (2)$$

Where: G is the baffle gap in cm.
Vr is the velocity in cm s^{-1} in the rearing unit.
Vb is the velocity in cm s^{-1} created by the baffle.
H is the water depth in cm of the rearing unit.

For example, if a baffle created velocity of 25 cm s^{-1} is desired and the rearing unit has a depth of 80 cm and a velocity (Vr) of 4.0 cm s^{-1}, the baffle gap (G) should be (3).

$$G = \frac{4.0}{25} \times 80 \text{ or } 12.8 \text{ cm} \qquad (3)$$

As the entire flow is forced through the narrow gap, it will soon dissipate upward into the water mass on the downside of the baffle. As much of the energy is dispersed, the initial velocity of 25 cm s^{-1} will slow down and some of the heavier solids may stop moving before the next baffle is encountered. However, very little water movement, created by the fish, is needed to move the solids within the "reach" of the next baffle. As a rule of thumb, baffles are spaced equal to the width of the rearing unit. Proper hydraulic characteristics are maintained when some of the energy is dissipated to the surface causing a slight but nearly imperceptible movement of the water at the surface. Under these conditions there are no dead spaces. To accomplish these objectives, relatively large flows are needed resulting in water exchange rates of four or more per hour, depending on the length of the rearing unit. Very long, non-conventional raceways require lower exchange rates if the overall raceway velocity (Vr) is not to exceed 4.0 cm s^{-1}. It is important to realize that high exchange rates also result in high rearing densities, as demonstrated with equation (4) (Westers and Pratt 1977).

$$D = \frac{Ld \times Eh}{.06} \qquad (4)$$

Where: D is fish density in kg m^{-3}.

Ld is loading in kg litre min^{-1}.

.06 is m^{-3} from 1 litre min^{-1} x 60 min.

Eh is the number of water exchanges per hour.

For an exchange rate of 4 per hour and a loading of 1.0 kg litre min^{-1}, the rearing density will be 66.7 kg m^{-3}. Baffles are not effective when overall raceway velocities are below 2.0 cm s^{-1}. A 30 m long raceway should operate at a minimum of 2.5 changes per hour, the optimum, however, is 4.0 changes.

Not all species of fish can be reared with baffles. Tiger muskellunge hybrids (*Esox masquinongy* x *E. lucius*), although successfully reared intensively in tanks or raceways, are swept to the lower baffle compartment where they remain. They will not negotiate the relatively fast current under the baffle. Of the salmonids, lake trout (*Salvelinus namaycush*) seem to behave likewise. Very small fish (< 2.5 cm) do not take to baffles well either. They must be introduced gradually to them. Rainbow trout (*O. mykiss*) accept baffles easier than

do brown trout (*Salmo trutta*) fingerlings. However all salmonid species reared in Michigan, except lake trout, can be successfully grown in tanks and raceways with baffles. This incudes coho salmon (*O. kisutch*), Atlantic salmon, and graying (*Thymallus* sp.). Baffles save many hours in tank and raceway cleaning and, consequently, reduce stress on the fish (Boersen and Westers 1986).

SOLID WASTE MANAGEMENT OF HARRIETTA STATE FISH HATCHERY

Harrietta Hatchery rears brown trout and rainbow trout to an approximate size of 35 to 50 g, respectively, for an annual production of up to 75,000 kg (1.5 million fish). The hatchery operates on 16,000 litre min^{-1} well water which has a constant temperature of 7.5 C. Supplemental oxygen is used to maintain a proper gas balance and for aeration. Indoor rearing occurs in nine tanks, each with a rearing volume of 12 m^{-3}, supplied with up to 800 litre min^{-1} flow. The fish are reared up to 4.0 g at densities up to 75 kg m^{-3} for rainbow trout, up to 50 kg m^{-3} for brown trout. Baffles are used to move the solids to a settling area behind the fish retaining barrier. Daily solid removal is by separate drain leading to the clarifier. The outdoor raceways have a rearing volume of 60 m^{-3}. There are 12 of these, arranged in three series of four ponds each. The maximum flow is 4000 litre min^{-1} per pond. Fish complete the outdoor rearing cycle in 10 to 12 months.

Figure 2 is a diagram of the Harrietta State Fish Hatchery solids management system. The settling area in the rearing unit behind the fish barrier generally is as long as the rearing unit is wide. The raceways are 30 m long and 3 m wide, the solids settling area is 3 m x 3 m. At a maximum loading of 2.0 kg litre min^{-1} and a feeding level of 1.0 percent body weight, approximately 6.7 g of solids are generated per litre min^{-1} day. This is based on the assumption that 333 g of solids are generated per 1000 g of feed fed (1:3 ratio). Per 4000 litre min^{-1}, the standard flow rate through this raceway, 26.8 kg of solids are generated each day. Because the solids remain quite intact, settling in the designated raceway section is rapid. The solid waste, characteristically, accumulates as shown in Fig. 3. If we assume a solids settling rate of 3.0 cm s^{-1}, for 15 to 20 cm trout, particles will settle within 27 seconds where the depth is 80 cm. Laterally they would traverse 89 cm for a velocity (Vr) of 3.3 cm s^{-1}, the norm for Michigan's raceways. However, since the particles are already near the

bottom as they enter the settling area, the bulk of the waste piles up immediately behind the fish barrier, as shown in the figure.

The sections are cleaned, ideally, twice a week once feeding levels approach 50 kg per day per raceway when approximately 17 kg of solids are generated per day. From 2000 to 4000 liters of water and solids are removed by siphoning the sludge through the floor drain into the clarifier. This requires 15 to 30 min per section. The sludge has a concentration of 3 to 5 percent solids by dry weight, depending on the skill of the operator and the amount of solids accumulated.

The clarifier measures 8.5 m x 17 m with a depth of .8 m. The sump has a depth of 2.0 m. A baffle wall disperses the incoming sludge over the full width of the basin (Fig. 4). Before each cleaning of the raceway sections, the supernatant water is lowered by means of removing stop logs to a level which provides the necessary space for the clean-out volume, which can be as much as 48 m^3 for the 12 raceways. Experience has shown that the clarifier is underdesigned volume-wise. It is emptied twice a year, once in the spring, immediately after the fish have been stocked, and once in the fall, before winter conditions prevent land disposal. While still winter, the sludge builds up so high that only four, or even fewer, raceway sections can be cleaned at a time, and even then, some of the sludge escapes into the lagoon. As a result, solids accumulate for too long in the raceway sections increasing cleaning time to as much as 45 min per section. Enlarging the basin or constructing a second one could solve this problem. However, another solution is considered. Eventually regulations will require subsurface injection of the sludge and this requires specialized, expensive equipment. For this reason an above ground storage tank will be constructed of sufficient size to store one year's production of sludge. Once a year, at prime time for land application (fertilization) the sludge will be hauled away under contract and soil injected. It is estimated that the tank volume for the Harrietta hatchery's annual production of 60,000 to 75,000 kg of trout must be 600 m^3,for a solids concentration of five percent. The sludge can be pumped, whenever necessary, from the existing clarifier into the land based storage tank designed for contract hauling of sludge.

CONCLUSIONS

The operational waste management procedures described, with the improvements recommended, offer a practical, economic and environmentally sound approach to solid waste management for an intensive fish production facility. It is estimated that 70 to 80 percent of the solids are intercepted and removed. This approach fits Michigan's hatchery design and operational mode for two major reasons. First of all, the serial reuse of water through three sets of raceways requires that solids are intercepted to prevent them from being passed on through the series. This would, of course, seriously degrade the water quality in the lower raceways. Secondly, Michigan's acceptance of high density rearing requires that high water exchange rates are maintained through individual rearing units. This, in turn, makes baffles effective in such situations, creating self-cleaning velocities of 20 to 30 cm s^{-1}.

Effective solids management, which includes frequent removal of relatively unaltered feces and waste food, significantly reduces phosphorus in the effluent, and, to some degree, nitrogenous waste. The hatchery has consistently met the National Pollution Discharge Elimination Permit (NPDES Permit) annual limits on phosphorus (590 kg) and a maximum allowable suspended solids level of 6.0 mg $litre^{-1}$. As a matter of fact, the suspended solids effluent level averages but 1.0 mg $litre^{-1}$. This represents about 8,400 kg per year which, in turn, is about 26 percent of the estimated annual production of 32,670 kg (70,000 x 1.4 feed conversion x 365 days divided by 3). The annual phosphorus (P) production has been around 500 kg. For an average P content in the feed of 1.3 percent, 1,274 kg P is added to the system (70,000 x 1.4 x 0.013). The fish retain approximately .4 percent or 280 kg (70,000 x .004), leaving 994 kg. If 20 percent of this is in the soluble state, the effluent carries out 199 kg or an average of 24 ug $litre^{-1}$ for 16,000 litre min^{-1}. However, the average level in the effluent has been about 60 ug $litre^{-1}$ for an annual discharge of 504 kg P. Thus, 305 kg must "escape" with or from the solids (504-199). If 26 percent of the solids "escape" and these would leach 75 percent of the P, 155 kg soluble P would come from this source. This would leave 150 kg (305-155) or 25 percent to leach from the intercepted solids. Reductions of P in the feed and improvements in solids interception and removal obviously can bring about a significant further reduction of P in the effluent.

New technology must be explored to improve on physically removing sludge from the water, preferably on a continuous basis in a dewatered state. It is even conceivable that a marketable product can be produced, for use as a plant food and soil conditioner.

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Association of Midwest Fish and Wildlife Agencies

57TH ANNUAL MEETING

July 19, 1990

Business Session
David F. Hales, Presiding

9:00 a.m.	Call to Order Roll Call	President Hales
9:10 a.m.	IAFWA Remarks	George Lapoint Legislative Council
9:20 a.m.	Region 3 Update	Marvin Moriarty Deputy Regional Director
9:30 a.m.	President's Remarks	President Hales
9:45 a.m.	Treasurer's Report	John Urbain
10:00 a.m.	Committee Reports	
	Audit	Doug Hansen
	Resolutions	Dick Pierce
	Break	
	Committee Reports (Continued)	
	Nominations	Don McCormick
	Awards	Art Talsma
	President Elect	Doug Hansen
11:15 a.m.	Old Business	President Hales
11:30 a.m.	New Business	
	Appointment of Midwest Representative to Planning Committee	
12:00 Noon	Adjourn	

THURSDAY, JULY 19, 1990

DAVID HALES. This is a test on the audience microphone. This is a test on the speakers' microphone. Thursday, July 19, right? I would like to call order, and I will start by calling the role. John, do you want to call the role, or shall I from here?

Arkansas, Colorado, Illinois, Indiana, Iowa, Kansas, Kentucky, Manitoba, Michigan. Say, yes, Karl. Where's Karl? Karl and John? Michigan's here. All right. Minnesota, Missouri, Nebraska, North Dakota, Ohio, Ontario, Saskatchewan, South Dakota, and Wisconsin.

JOHN URBAIN. We do have a quorum.

DAVID HALES. And there being a quorum noted, I will welcome you to the business meeting. I have to tell you that it's a great pleasure to be back over here and not over in Lansing where I was yesterday playing the things that reminded me of a story that maybe some of the folks who worked at Interior will appreciate.

When I was Deputy Assistant Secretary of Interior, one of the things we had to deal with was burros in the Grand Canyon. Marvin, you'll probably remember this because Fish and Wildlife Services brought in biological consultants, and we were trying to figure out what the hell to do with burros in the Grand Canyon and figured we could air-lift them out for $6,000 an animal and one thing or another.

After awhile, we had the Park Service write all these letters for my signature because all these people would write in "Save the burros." "Kill the burros." Do whatever. I stopped reading the letters very closely, and I would sign anything the Park Service sent through, which was a great mistake. I signed one letter that misspelled the word "burro." It was spelled "b-u-r-r-o-w." I'd gotten this great letter back from a guy who said, "Mr. Secretary, 'burro' spelled 'b-u-r-r-o' is an ass, and 'burrow' spelled 'b-u-r-r-o-w' is a hole in the ground, but it doesn't surprise me none that you don't know the difference."

There were some legislators yesterday who shared that opinion of my abilities and acumen, so it's nice to be back here at this meeting.

The first item we need to take up is the adoption of the minutes from the last business meeting, and I would entertain a motion to adopt or amend. Move to adopt from Kentucky. Illinois seconds. John?

JOHN URBAIN: I have a couple corrections to the minutes.

DAVID HALES: Are you picking up? If we want this on record, and I understand that we do, then for substantive comments, let's take the microphone to people, rather than have the trooping back and forth. Rex, could we do that? I think we've got enough cord on it.

JOHN URBAIN: I have a couple corrections. They're on the second last page of last year's proceedings. Line 6 should read, "$13,914.46," and line 8 should be inserted, and it should read, "The balance of the checking account forwarded to 1989 was $5,619.67." Those are the only corrections I found.

DAVID HALES: Kentucky, still moved we accept? Second? Second is still present. Other comments? Any opposition? Noting none, we'll adopt the minutes.

You have an agenda in front of you. It would probably be appropriate to formally adopt the agenda. There are no changes to propose from the Chair. Are there any changes to propose from delegates? Do I hear a motion to adopt the agenda? Moved by Colorado. Seconded by Ohio. Ohio. No. Well, you ought to turn it over then. Somebody from Michigan played a trick on you. Oh, that's round on both ends and high in the middle, right? OK. Ohio seconds the motion. Any opposition? Seeing none, the agenda is now adopted, and with that I'll turn the rostrum over to George LaPointe for remarks from the International.

GEORGE LAPOINTE: Thank you, David. I've gotten about six pages of notes. I note I only have ten minutes in the agenda, so I'll try to keep this as short as possible.

The first thing I'd like to do is talk about a couple of business items with the Association. I've handed out, as most people can see, a bundle of paper. One of those pieces of paper is on the Association's annual meeting which is going to be the 8th through the 12th of September in New Orleans. If folks haven't already, I recommend they register for hotels as quickly as possible because Monteleon will probably, if it hasn't already, fill up. I'm sure the Louisiana Wildlife and Fisheries folks will give you the names of spill-over hotels for that meeting.

It promises to be a good meeting. We're going to have our normal two days of committee meetings and then a session which will deal with three issues, only two of which I can remember at the moment. One is the animal rights issue which is taking an increasing amount of time on the part of the states and the Association, and another issue will be wetlands.

The second item I handed out was the brochure or the preliminary program for the First National Shooting Range Symposium which we've been organizing with a number of cooperating organizations. I got an update on registrants about a week and a half ago. The registrations by states are low, so I encourage folks to go to that meeting if they can do so because it'll be an important meeting for a couple reasons: one, to get the latest information on shooting ranges, and secondly, to show that the states are interested in shooting ranges from a PR perspective. A lot of folks are saying that the states are disinterested and don't spend enough of their PR monies, so in that regard, it's important the states are there to defend their actions.

Switching to two items occurring in Washington, the first thing I'll mention, and I'll just mention it briefly, is the budget deficit and the ongoing negotiations to try to bring that to a head. I was just listening to the news

yesterday, and they projected a $231 billion budget. Our Gram Rudman target for this year is $64 billion, and it doesn't take a very smart mathematician to show that that's a big difference. I don't know where that'll come out in the end. Folks are talking about new taxes. There will certainly be spending cuts. The effects on the appropriations process aren't known at this point, but the appropriations bills will probably go through the congressional process, and then we'll have across-the-board cuts thereafter.

I've talked to some Agency folks who have been told to put together the impacts of a 5, 10, and 20 percent reduction in their budgets, the impacts on their programs. Any way we look at that, that's big trouble. Of particular concern to the states are Wallop-Breaux and Pittman-Robertson. You'll remember last year that the budget sequestration did affect those programs, and then we got the money back this year. If you talk to your congressional delegations, what we've been doing is urging the states to say that as User P programs become increasingly popular with the federal government, they have to be treated separately just from general appropriations because the folks are paying in, and they should get the benefits from those programs. And last, the more we hear about the budget deficit situation, it suggests we're probably going to go into a lame duck session after the election.

I'll briefly mention the North American Wetlands Conservation Act, and I've handed out an update that was put together by the Service on that. There are a couple things in the Fiscal Year 1991 appropriations process. We've been pushing for full appropriation which is $26 to $30 million depending upon who's doing the addition. It's starting to appear that we may not get that full appropriation, but we may get in the order of $15 to $20 million. The approach we've been taking on, that is, if we can show Congress that we can spend that $15 million appropriation well, will help in the following year.

And last on that item, there's been a lot of discussion about whether the projects under the Wetlands Conservation Act are subject to NEPA compliance. A lot of folks in the interest of streamlining say, "No, we don't want to go through the NEPA process." In talking to congressional folks, it's clear that they want North American Wetlands Conservation Act projects to undergo the NEPA process, and then that'll probably come through in the end.

The next item I'd like to mention is the 1990 Farm Bill. We've been pleased with the progress on the Farm Bill. It may have been voted on the Senate floor last night or today and will probably be voted on next in the House. I started off working on the 1990 Farm Bill when it started in March of last year, and we had a lot of discussions. We had a bill which was not really good in the Senate, and we got that turned around into a fairly good situation. We did the same thing on the House side. The way we've been viewing the rest of the Farm Bill is that we haven't been working with the Senate or the House to try to get a lot of changes on the House floor because of some agreements we've made. What we want to do is try to fine-tune the process in the conference when the Conference Committee comes out, and we hope that will be in September. I've handed out a couple things on the Farm Bill. One is a side-by-side comparison that was done by Mark Reef and Gordon East of our staff and then an impact of the Farm Bill by acres that Gordon East did for us.

One of my biggest items this year was the refuge administration legislation which we had a hearing on in late June. I understand that we have a resolution dealing with that issue which, I think, is entirely appropriate because while the hearing went well, and I think the states and federal government stated their case well, the issue won't go away. So it's important that we maintain interest on that.

I'll briefly mention an item that was part of the earlier drafts of that legislation. It's House Bill 1268 which is legislation dealing with a national policy on biodiversity. I've been talking, ranting, and raving to a number of folks in this room about how we handle biodiversity, and I urge folks to consider this pretty seriously because it's something that's coming up again and again. In the past, we kind have just said, "Well, we already managed for biodiversity. Just go home. We don't want to talk to you." We need to be able to react well to proposals that come along. That's not buying onto biodiversity necessarily or the proposals that come along but just in really thinking through the process and how we do, in fact, already manage for biodiversity and how we can deal with this issue.

I see three important items in dealing with biodiversity. The first is getting a good working definition that we can work with in the states. The second item is trying to get an idea on what scale folks want to apply preserving biodiversity. The reason I mention that is in talking to Max Peterson about the implementation of the Forest Management Act in the mid-70s, one of the mandates was managing for multiple resources. There was a lot of discussion about whether you had to manage every acre or every section for multiple use.

The last is how you integrate man into whatever biodiversity schemes come along. A lot of the folks who are really pushing this tend to forget that man is a component of the land and the ecosystem now, and I think that's quite important.

One of the items we had worked on earlier in the year was the Senate oil spill legislation (Senate Bill 686), and that had been in conference for a long time. The main thing we worked on there was the language in the House that would have urged ratification of International protocols on oil spill legislation. What that would have done is it would have preempted state law when, in fact, the state law was more astringent than the federal legislation. Luckily, Senator Mitchell was the champion of that issue, and we prevailed. The biggest issue right now, and I haven't heard lately since I left how that's coming out, is whether or not to require double hauls on vessels.

An issue of interest to the Great Lakes has been the zebra mussel legislation. You folks probably know that better than I. The main bills I've been dealing with are House Bill 4214 and Senate Bill 2244. There were hearings in both the House and Senate, and the reason I mention that is I've had a couple states call and ask about the effects on state management authority in regard to intentional introductions. I think the Interior Department has some push for including some protocols on intentional introductions, and I think folks should pay attention to that legislation as well.

At this point, the zebra mussel legislation dealt with the Great Lakes, of course, and with unintentional introductions throughout the Country. I think that's now being pulled back just to deal with the Great Lakes and the zebra mussel issue. I think, from my perspective, that's entirely appropriate because we're almost certain that zebra mussel will surely get throughout the Mississippi River and Ohio River drainage. If we can get a couple years under our belt of dealing with this issue in the Great Lakes, that'll give a good model of what to do or not to do in the rest of the Country as these sorts of issues come up.

I want to say a brief note on the Fish and Wildlife Conservation Act, the Nongame Bill. We've been pushing for a simple two-year reauthorization with no changes to the legislation because the Association has an Ad Hoc Nongame Funding Committee which includes state members, defenders of wildlife, National Wildlife Federation, the Service, Wildlife Management Institute, and some others. Our contention has been that give us a two-year reauthorization, and our committee will come up with whatever recommendations it has by that time. That'll give us a good place to start for trying to get some good federal nongame funding on a reliable basis.

I'm already into discussions. Am I way over time already?

DAVID HALES: No.

GEORGE LAPOINTE. Good.

DAVID HALES. Another 10 or 15 seconds will be good enough.

GEORGE LAPOINTE. Well, this is an important 10 or 15 seconds. I'm getting into a number of discussions in Washington already about the 1992 reauthorization of Wallop-Breaux (Aquatic Resources Trust Fund). I was in a meeting earlier this month, and people are talking about more money for boating safety, money for the Indian tribes, money for continuing education, and a said amount of money for continuing education for fisheries folks in the states--just a lot of darts being thrown at the Wallop-Breaux pie.

I've urged, and Max is going to ask Steve Lewis, our incoming President, to convene an Ad Hoc Wallop-Breaux Committee so that the states can get their positions together early in this process because it's going to be a busy two years on reauthorization.

There are two final items. One is Senate Bill 2772 sponsored by Senator Kasten of Wisconsin. It's called the "National Fishery Resources Conservation System Act." The fisheries folks are concerned that there's no federal system to protect fisheries habitat. What this, in essence, would do is establish a Fisheries Refuge System with a federal-state private cooperation. It recreates a Fisheries Resource Conservation Board to direct and point out what essential fish habitat is. It would get its appropriations through the Land and Water Conservation Fund, and a lot of other folks would like to get some of that money as well. I would encourage the states to look at that from a couple perspectives: one, how we can expand to get some

adequate protection of critical fisheries habitat; and secondly, as the refuge GIS goes forward, how we can perhaps try to get the Service to pay more attention to fisheries issues.

And last, something we've been discussing a lot the last couple days has been the Great Lakes Fish Restoration Act. I've been talking a lot to John and John about this and trying to get emphasis on fisheries resources of the Great Lakes and some federal coordination and money for research into the system. I think there's a lot of interest in the bill, and it just needs some time to cook and for the states to have input. Probably it won't go anywhere this session which would be all right, and then next year, we could carry on again. Folks, who have been around a lot longer than I, have told me that the Service was a little heavy handed 20 years ago, so that's one of the sensitivities the states have about that issue.

That's all I was going to mention this morning. I would be happy to entertain any questions. Mr. McCormick?

DON MCCORMICK: (Inaudible)

GEORGE LAPOINTE: Yes.

DON MCCORMICK. What did you . . . on the Animal Rights Act?

GEORGE LAPOINTE. There's going to be a session on animal rights.

DON MCCORMICK: What's it . . . . (Inaudible)

GEORGE LAPOINTE. It'll be a panel. Well, I should mention that our Animal Welfare Committee has an ongoing process of trying to figure out how we, as resource agencies, can deal effectively with the animal protection movement. Now you know we're all spending more time on the issue. We hear about it every day in Washington. That's separate from that, but it's just trying to highlight some of the issues, and they hope to get somebody on the panel who will give an even-handed view of the issue. I know Johnnie Tarver is putting this together. It's a big interest of his all the time, but I don't know exactly how that'll pan out.

Other questions? Thank you.

DAVID HALES: Next item on the agenda is the report from Region 3 and Marvin Moriarty.

MARVIN MORIARTY: Thank you, Dave. As you may know, Jim Gritman, our Regional Director, usually likes to attend this particular meeting. Unfortunately, this year the Director of the Fish and Wildlife Service, John Turner, called a meeting of the Directorate in Ashland, Oregon. Jim felt compelled to go to that meeting since he was told he would be given his performance evaluation at that meeting, so he had to go to defend his honor. I'm pleased to report that we, as a region, did quite well. In the Director's eyes, Jim Gritman has performed quite well. So, instead of just sending one person to this meeting, Jim decided, "What the heck, I'll send my management team along."

I know that a number of you have been interacting with us from the Fish and Wildlife Service here over the last few days. There's been some confusion in terms of organizational perspective as to who we all are, so I thought I'd introduce us to you formally. I'm Jim's Deputy, and I have with me John Christian. John, if you could stand. John is our Assistant Regional Director for Fisheries and Federal Aid. John is brand new. We've given him a fairly easy task; that is, we want the best fisheries program in the Fish and Wildlife Service here in this region. We gave him about three weeks to do that, and we're looking forward to a really serious program on the Fish and Wildlife Service--one that'll complement that which is going on in the Great Lakes and in the upper Mississippi River.

We have John Eadie who's our Assistant Regional Director for Refuges in Wildlife, and I think you all may know him especially through our Farm Bill and Refuges activities. We also brought with us Barb Milne who is our Human Resources Officer or Assistant Regional Director for Human Resources. Quite frankly, Barb is a fairly recent member of the Regional Director, and one that is helping us achieve some greatness in the eyes of the Washington Office.

We're dealing with some particularly vexing issues right now related to recruitment, retention, and training of minorities and women. We're finding ourselves in an ever-increasingly competitive marketplace for good qualified people. So, we're having to be a little bit more innovative in what we do, and Barb is really helping us out there.

Oh, by the way, Bob Lange, our Federal Aid Coordinator, has been here this week. He's not here this morning, but he has been here this week. I've seen him interacting with many of you.

John Urbain mentioned that when Jim does come to these meetings, he likes to give you a little peek at what's going on with the ducks. I called Jim and asked him to return my call which he did at 2 o'clock in the morning. I can't guarantee the accuracy of what I'm about to pass on to you, nor can I read it. I'll just basically say that his feeling is, as he's going into the season now, that the ducks are up in some places, and they're down in others. That's a nice diplomatic answer, but that's how he feels about what he's seen. I say that the Dakotas are still in bad shape in terms of numbers. The recent rain should improve things.

Jim says that since the fall flight for numbers seems to be about the same as last year, he doesn't foresee any significant changes in the regulations this year. He actually sees more of a push towards status quo. He says he can be surprised, and he feels he's the conservative one on the Committee, but he really thinks it's going to be a status quo this year.

Jim did say that there are going to be several issues brought up for comment which have been analyzed by our Migratory Bird Program Office in Washington, DC, and they are on the point system, early seasons, and splits in zones. So, he looks forward to an interesting Regulations Committee meeting just because of those three issues.

With regard to the North American Waterfowl Management Plan, I'm proud to say that our region, even though we don't have a single joint venture that is our responsibility at this point, does participate very fully in the three joint ventures that involve our region--those being the Mississippi Valley Joint Venture, the Prairie Pothole Region Joint Venture, and the Lower Great Lakes and St. Lawrence Joint Venture.

We're proud of the Mitchell Act projects which are currently going through the priority setting and decision-making phases, as far as funding. We're also pretty proud that our region is well represented in terms of state proposals that are before the various Joint Venture Management committees. I believe we have 7 of the 14 in the Prairie Pothole and 4 of the 8 in the Mississippi, and I doubt if there are that many in the Great Lakes-St. Lawrence Joint Venture. We were well represented there too. We're looking for good things to come out of that.

We chose in our region to not come up with any of our own projects to put in. We decided that we would support state projects that were put forth with one exception. I think that was in Iowa where we said, "If any of the Iowa projects are not put in, we have an easement project that we would like to see put in." That's the only exception.

Like I said, we had a good year. I'll just bring up this word "partnerships." It seemed to be the word that was used most last Tuesday. I fully agree that we are discovering the value and power of partnerships with our state and local NGOs in terms of getting the job done. It's been an exciting year in that regard as, I think, partnerships have become a growth industry. As a matter of fact, we're seeing it in recreational fishing opportunities and recreational opportunities in our hatcheries. We're definitely seeing it "big time" on our Farm Bill-Wetland Restoration activities or Private Lands activities. It's certainly very gratifying to see that.

With regard to the upper Mississippi River activities, we have three federal agencies in five states--all with, sometimes, conflicting responsibilities and overlapping. At this point, I'd say we are working very well when several years ago that wasn't quite the case. We had some problems come up with our Environmental Management Technical Center in that we were being accused of allowing that center to be captured by the Corps of Engineers. We took some management and personnel actions this year to fix that. We believe that has been fixed judging from the feedback that we're getting from the various states right now. We think that is working quite well, and in fact, if you have any input to give us, we would appreciate hearing it.

I mentioned that Bob Lange wasn't here today, but I do want to talk a little bit about what he's doing. Several years ago when I first got here, and Jim had been here, I guess, a month as a Regional Director, we started receiving a lot of calls from various State Directors about some of their Federal Aid proposals that were being held up. In one case, I remember one project was held up because we didn't like the pitch of a roof on a hatchery or something. We started to question ourselves on the amount of oversight until we would

give in to these Federal Aid proposals. We took a long, good look at it. We found out that, yes, maybe we were holding the hammer a little too tightly and what we needed to do was get into a partnership role with the states.

The situation has changed traumatically over the last 20 years, and we think a full partnership is what is needed at this point. We turned Bob Lange loose on this idea, and we think he's done a good job of making it work. We're hearing from many people outside of the Region. We go to meetings outside the Region, and we hear a lot of people talking about what we call a Federal Aid Renovation in Region 3. It is one in partnership with the states in that we are working together with them to identify ways to get the funding to the states in a much easier fashion than we have been used to. It's producing results. There's a lot of enthusiasm for it.

What we need to do is go into Phase II. We had Phase I last year. We got the states all together, primarily staff, and they came up with 22 recommendations on how to renovate the process. What we need to do this year is to have management come together and start taking those implementing actions that will make those 22 recommendations actually bear fruit. We planned a meeting this November 8, and we're going to be asking the State Directors or their Deputies to come to this meeting and bring along the horsepower to commit some management changes within the Agencies, including the Fish and Wildlife Service, that is going to make this work. We're pretty excited about that and are looking forward to good things.

With regard to the Great Lakes, there's been a lot of discussion here this week about two things that the Fish and Wildlife Service is involved in. One of those is a Great Lakes Initiative, and another's a piece of legislation that Congressman Nowack has on the floor. They're two separate things. Right now, the Great Lakes Initiative has been presented to the Great Lakes Fishery Commission, and all of you probably know it is an internal service marketing document. It's something that we have decided to do in Region 3 along with our sister region (Region 5 in Boston) and research in order to bring some focus to the Great Lakes, their resources and their issues, primarily because over the last 10 to 15 years, the Great Lakes as a funding focus haven't really been there in the Fish and Wildlife Service. They haven't competed very well, and one of the reasons is that they're divided amongst three regions.

Each of the three regions has varying priorities at different times, so we decided to get our act together and bring some focus to the Lakes. This is all targeted toward a 1992-93 budget process. What we're intending to do is get our fair share of that budget pie when it's divided up. We think it's bearing fruit. Our Director John Turner and also Assistant Secretary Connie Herriman are saying the right things right now. We're pleased with that, and we'll see when it comes to actual budget time.

Now as a result of some budget problems that we had last year, the Ann Arbor Lab here, a research component, announced that it wasn't going to be able to do the full job that it was supposed to in terms of fisheries assessment on the Great Lakes. That got some of us nervous, and our folks in the Boston Region got very nervous about that because one of the things that was going

to be cut was some assessment on Lake Ontario and Lake Erie. They worked with Congressman Nowack to have a piece of legislation introduced, and that legislation calls for a Fishery Assistance Office on the lower Great Lakes.

We also had Congressman Davis get very interested in this and work with the drafting of the legislation and introduce some other aspects to the legislation which, we think, have the potential for being good.

Right now, the legislation isn't quite as well written as we'd like it to be. It calls for a Centralized Coordinating Office to be headed by the Fish and Wildlife Service as well as a major study on the Great Lakes to determine what is, indeed, impacting on the fisheries on the Great Lakes.

We have a lot of work to do with this legislation. Its focus doesn't appear to be right. We're out in the Region. We're more attuned with the partnership role that we should be having with the various states on the management of the Great Lakes resources. This doesn't really come through very clearly in that legislation, so we'll be working very hard to get those comments through to Connie when she goes to testify. I guess the first hearing on that is August 2.

Like I mentioned before, on the human resources side, we think we're trying a lot of innovative things in the Region and would like to compare notes some time with you on how you are dealing with your recruitment, retention, and training of individuals in the various organizations.

Along those lines, I'd like to say that the Director has agreed to allow Mr. Byrd of West Virginia to give us some money to plan a major training facility for the Fish and Wildlife Service in Harper's Ferry, Virginia. This major training facility also happens to be connected with a visitor attraction, something on the order of the Baltimore Aquarium or the National Zoo. We're not quite sure yet, but this is all intended to hold people in Harper's Ferry a little bit longer, but to do what?

Mr. Byrd also said he would allow us to build a major world-class training facility which we're in the planning process right now. I'm on that group that's looking at what it is we're going to be doing, and I'll tell you it's very exciting. There's a major component in there for states training that would be provided to states, as well. It's in its infancy stages right now. I think you'll be hearing much more about that later as we start to consolidate what it is we want to do. We'll be coming to the states and working with them to better identify what's going to be done.

On the national scene, we had an interesting discussion at the end of Tuesday on this Plan Management System. I was particularly interested because our Director John Turner has decided he wants to do that, and he has brought a fella named Doug Crow from Wyoming in to actually head up that charge. John Turner is very good. I don't know if any of you have seen or heard how he has been able to deal with the political process as it relates to the spotted owl and a few other very, very touchy issues. He has stood up for the resource and for the biologist. He's done quite well, but he'll be quick to tell you

that he gets really tired of these crises as they keep running up the hall to him. He would really like to see the Fish and Wildlife Service do a little better job of setting its direction and planning, so he's embarked upon this thing that he calls "CSMS." Very simply defined, it's the Common Sense Management System.

The CSMS basically follows along the same track that many of the states have already gone with this Plan Management System that the organization of wildlife planners has helped them do. I'm also involved in that, and we're in the early stages. We're going to be coming out with a document very shortly that is going to be sent to the states to start to get their input on this. We're excited about it because for a long time, a lot of folks have held their ideas about where the organization ought to be going, and Doug is now tapping that resource. He's hearing a lot of interesting things, and we'll be making a lot of decisions very shortly. What he would like to do is have this whole process wrapped up by January 1, so he can announce to the world, "This is where we're going. This is how we're going to get there, and this is how we're going to measure how we got there." He's excited about that.

I don't know if any of you are encountering this as well, but we have a lot of Russians visiting. We've had them come through on a Big River Initiative that we have going out of our Columbia, Missouri, Office, and they've come through. I guess they'll be coming through for a second time here shortly. We're sending our scientists over there as well, and in August of this year, we have a group coming over that's interested in big lakes systems. A "by call" group is coming over. They're going to share experiences with what's going on in Superior, so I find that to be a very interesting turn of events.

Just one last thing here, we also have the National Recreational Fisheries Policy. You all may have seen that we put out a National Fisheries Recreational Policy along with the various states a couple years ago. The Forest Service and the BLM have, themselves, implemented an internal policy which is intended to implement the National Recreational Fisheries Policy, and now the Fish and Wildlife Service is in the process of following suit. The Director has just recently signed an implementation policy for the Service to get us more involved in the national recreational fisheries scene, so we're excited about that as well.

That's really about all I brought up to comment on. If there are any questions, go ahead and ask them. I also have John and John here too.

GEORGE LAPOINTE. We've been dealing a lot with the Rec. Fish. Policy. Mark Reef of our staff, in particular, has. One of the things that's been mentioned time and time again is jazzing up the Fisheries Program on Refuges. That's hardly mentioned in your service-wide Rec. Fish. Policy document. Is there a reason, or do folks want to crank up the Program on Refuges?

MARVIN MORIARTY. Yes, they do. Again, there's another one I've just recently become involved in. It's the blue document that was signed. I think the reason you didn't see it is that nobody really knew anything about it when they put that thing together. We believe they didn't have the right people

representing the right interests within the Fish and Wildlife Service putting it together. We now have a group that is putting together an implementation plan, "The Comanagement for Fisheries and Codevelopment of Fisheries on Refuges," and that is a very major part of it. They asked us from Region 3 to become involved in this largely because we have a very aggressive Fisheries on Refuges Program in Region 3, and they wanted to tap our experiences. It's very much a part of what they're trying to do now.

GEORGE LAPOINTE. Thank you.

DAVID HALES. Are there any other questions or comments? The next item on the agenda is "President's Remarks." I'll summarize them by saying that I'm looking forward to the "Treasurer's Report" that John Urbain will now give us.

JOHN URBAIN. Thank you, Mr. President. This report will cover the calendar year 1989.

Total assets beginning on January 1, 1989, were $13,914.46; receipts for 1989 annual dues were $1,800; and interest on cash management accounts was $773.79, for total available assets of $16,488.25.

Disbursements for 1989: Advancement to Minnesota for our meeting in 1989 was $500; Omni Press 55th Annual Proceedings were $936.01; Melville Emblem was $6.61; and Wildlife Management Institute was $5,000, for total disbursements of $6,442.62.

The accounting of the assets in our checking account as of December 31, 1989, was $3,477.05, and cash management account was $6,568.58, for total assets at the close of the 1989 year of $10,045.63.

Are there any questions or comments? Is there a motion?

DAVID HALES. Kentucky moves. Nobody is going to second it? Everybody seconds. Should we adopt this before we have the "Audit Committee Report?" Then without objection, we'll adopt the "Treasurer's Report" and then call for the report from the Audit Committee. Doug?

DOUG HANSEN. Mr. President, the Audit Committee has looked over the accounts of the Treasurer, and we found that after amending the minutes of the last meeting, the accounts are accurate and truly represent the financial condition of the Midwest Association. John has a truly unique way of keeping his books. He's changed the minutes to reflect what his books say, right, John? So, I would support the motion to approve the "Treasurer's Report."

DAVID HALES. Do we need action on that, Mr. Secretary? So do we want to accept the Audit Committee's endorsement of the "Treasurer's Report?" All right. Motion to that effect? Dakota? We have a motion to accept and a second from Indiana. Any opposition? Did Ohio object? I tried to fuzz that over by dropping the north or the south, but it didn't work, did it? Without objection, then we will adopt the report from the Audit Committee and call on Dick Pierce for a report from the Committee on Resolutions.

DICK PIERCE. Thank you, Mr. President. This is Ohio, and I'm sorry if you didn't get an opportunity to submit a resolution. That's my fault for getting started a little late on that. If you have one, we'll welcome it at this late minute. If we have five resolutions and if I get John to help me pass these out, we'll run through them here really quickly. Then, I think the procedure is for Mr. President to read them and let you take over then.

I want to thank Rex and his staff of Michigan DNR for getting these resolutions typed at the last minute for me. We had some corrections and additions as we went through here. I would assume the procedures would be to start out and read through these and enter them into the record and then, Mr. President, let you deal with them from that point.

DAVID HALES. Go ahead and take the vote if that's all we're doing. Then just go right through, and we don't have to worry about playing yo-yo with it, if that's all right?

DICK PIERCE. OK. Resolution No. 1--1990 Farm Bill. Whereas, the majority of our Midwest fish and wildlife and native plant resources are directly affected by the management of private lands; and whereas, farmers or agricultural producers are the primary private land managers in the Midwest; and whereas, the 1985 farm legislation contained major conservation provisions that began to improve management of soil and water resources that directly benefited our fish, wildlife, and native plant resources; and whereas, these conservation provisions need to be continued and improved upon to better protect and enhance our fish, wildlife, and native plant resources; and whereas, Congress is developing new farm legislation for the 1990s and the future status of our fish, wildlife, and native plant resources is dependent on the content of this legislation; and whereas, it is essential for the Association of Midwest Fish and Wildlife Agencies to provide recommendations and input on the new farm legislation so that fish, wildlife, and native plant resources are protected and enhanced; and whereas, an important strategy for providing these recommendations is through the use of the Wildlife Management Institute; and now, therefore, be it resolved that the Association of Midwest Fish and Wildlife Agencies fully supports continuation of development of sound conservation ethic in the 1990 Farm Bill including establishment of a multiyear set-aside and continuation of the Conservation Reserve and Swampbuster; and be it further resolved that the Association of Midwest Fish and Wildlife Agencies refers this resolution to the International Association of Fish and Wildlife Agencies for adoption at its annual meeting in New Orleans, Louisiana, in September 1990.

With that, do we have a move to adopt? I've a problem with my eyes. I can't see with my glasses on up close, and I have to put them on to see far away.

Illinois? Lyle Adams? We have a motion to adopt from Illinois. Is that seconded? That is seconded from Colorado. Any discussion? I'll assume we should take a vote on that. All in favor, signify by saying, "I." Opposed? Resolution No. 1 is adopted.

Resolution No. 2--Hunting, Fishing, and Trapping on the National Wildlife Refuge Systems. Whereas, the United States Congress is considering House

Resolution 4948, the National Wildlife Refuge Systems Act of 1990, to amend the National Wildlife Refuge Systems Administration Act of 1966; and whereas, the United States Fish and Wildlife Service currently has authority to properly manage the national refuge system and has done so in a commendable manner; and whereas, this legislation infringes on the basic sovereign responsibilities of the states to manage residence fish and wildlife; and whereas, this legislation fails to recognize hunting, fishing, and trapping as legitimate uses of national wildlife refuges; and whereas, the Secretary of Interior arbitrarily closed the Sleeping Bear Dunes and Pictured Rocks National lakeshores to trapping, on the basis that trapping was not specifically authorized in legislation, even though the State of Michigan conveyed land to the U.S. Department of Interior with the explicit understanding that the state would retain the right to manage wildlife resources, including hunting and fishing, and that by state statute, hunting has been synonymous with trapping in the management of wildlife; and now, therefore, be it resolved that the Association of Midwest Fish and Wildlife Agencies on July 18, 1990, strongly urges the United States Congress to explicitly protect the right to hunt, fish, and trap within our national wildlife refuge system, and that any legislation governing our national wildlife refuge system must fully recognize the states' appropriate role and right to manage resident fish and wildlife, and must recognize hunting, fishing, and trapping as legitimate uses of the national wildlife refuges; and be it further resolved that the Association of Midwest Fish and Wildlife Agencies refers this resolution to the International Association of Fish and Wildlife Agencies for adoption at its annual meeting in New Orleans, Louisiana, in September 19, 1990.

Kentucky moves to accept or adopt. Minnesota seconds. Discussion?

GEORGE LAPOINTE. The second line from the bottom where it says, "the states' appropriate role and right to manage resident fish and wildlife." Paul Linzeni always coaches me to say, "Fish and resident wildlife." It's a small point.

DICK PIERCE. "Manage resident fish and resident wildlife?"

GEORGE LAPOINTE. No, all fish are just "fish and resident wildlife."

DICK PIERCE. "Fish and resident wildlife?"

GEORGE LAPOINTE. Might as well be consistent.

DICK PIERCE. We're easy to change here. Anybody disagree with that? So change it to "manage fish and resident wildlife?" Should we go back to move to adopt that now or just leave it as it is? OK. With that change penciled in and if that's appropriate to the Committee, all in favor, signify by saying, "I." Opposed, the opposite. So passed. Approved.

Resolution No. 3--Introduction of Harmful Organisms with Discharge of Ballast Water for Ocean-Going Vessels Entering the Great Lakes. Whereas, exotic organisms, such as the Chinese mitten crab, the spiny water flea, the ruffe, the zebra mussel, and the tuber nose goby, are being introduced with discharge

of ballast water from ocean-going vessels entering the Great Lakes, and such introductions of harmful organisms threaten to disrupt native ecosystems through predation, competition, infection, genetic effects, and habitat degradation; and whereas, one thousand overseas vessel trips, 39 percent in full ballast (i.e., carrying ballast water in cargo holds as well as in the dedicated ballast tanks), are recorded in a typical year for the seaway, each carrying up to 1.25 million gallons of water and thousands of live exotic organisms; and many thousands more overseas vessel trips are recorded for the ports in fresh and brackish waters connected to the Great Lakes such as the Hudson and St. Lawrence rivers; and whereas, many exotic organisms, such as the spiny water flea, zebra mussel, and ruffe will spread inland from Great Lakes footholds in North America; and whereas, it is not practical to eradicate invading organisms once established in the large open systems such as lakes and rivers; and whereas, a single exotic species, such as zebra mussel, could cost society $4 billion in the Great Lakes basin alone; and now, therefore, it is resolved that the Midwest Fish and Wildlife Administrators meeting on July 17, 1990, in Grand Rapids, Michigan, recommends that the discharge of ballast in the Great Lakes be regarded as a privilege granted only to those ships taking reasonable precautions in order to protect other uses of North American freshwater, including drinking water, power generation, and recreation; and it is also resolved that the governments of the United States and Canada should enact without delay, the legal instruments necessary to prevent ballast-borne exotic organisms from entering the Great Lakes or connected fresh and brackish waters such as the Hudson and St. Lawrence rivers (e.g, the United States' Title 1 of S2244 and House Resolution 4214, the Nonindigenous Aquatic Nuisance Act of 1990); and it is also resolved that the governments should provide their coast guards with adequate resources to develop, implement, monitor, and enforce required measures; and charge their coast guards to coordinate and integrate U.S. and Canadian ballast exchange programs as fully as possible for purposes of standardization, enforcement, and monitoring, pursuant to the Great Lakes Water Quality Agreement; and is also resolved that the governments of the United States and Canada should instruct their national delegations to provide leaderships and multiple disciplinary expertise (e.g., ecologists, oceanographers, water treatment specialists, naval architects) to the International Maritime Organization of the United Nations in order to foster recognition of the global problem of ship-mediated introductions and to develop standard comprehensive strategies for its resolution; and be it further resolved that the Association of Midwest Fish and Wildlife Agencies refers this resolution to the International Association of Fish and Wildlife Agencies for adoption at its annual meeting in New Orleans, Louisiana, in September 1990.

Do we have a move to adopt? Michigan so move. A question?

GEORGE LAPOINTE. Yes, one technical question. I believe it's "tube nose goby," not "tuber nose goby" in the first paragraph.

DICK PIERCE. "Tube nose goby?" So drop the "r?" Obviously, that was a Michigan typographical error. Colorado?

COMMENT. The fourth paragraph after "established," insert the word "in," and in the sixth paragraph, after "therefore, it is resolved," "Fish and Wildlife Agencies" should be used as opposed to "Administrators."

DICK PIERCE. OK. Any other corrections? So with the corrections as stated, the "r" in "tuber nose" and in one, two, three, four paragraphs down after "established," add "in," and the sixth paragraph down, scratch "Administrators," and make it "Midwest Fish and Wildlife Agencies." Are those correct? Manitoba?

COMMENT. I just wondered, one other small point. You may want to change July 17 and make it consistent with Resolution No. 2 which references July the 18th. You might want to have the same date.

DAVID HALES. And today's the 19th. If you trust us to check the date, we'll put the date in on all of these in a consistent manner.

DICK PIERCE. That makes good sense if we would change all to July 19. Any other corrections? Do we have a move to adopt? Michigan made that originally, or was their's a move to correct?

COMMENT. They moved to correct and adopt.

DICK PIERCE. Correct and adopt. All right. Thank you. Have a second? Second from Kansas. Any further discussion? All in favor, signify by saying, "I." Opposed, "Nay." Pass.

Resolution No. 4--Amendment to the Federal Power Act of 1920. Whereas, the U.S. Supreme Court ruled in California versus Federal Energy Regulatory Commission (FERC) that the state could not use its police powers to impose the minimum stream flow requirements to protect fish in a stream from which water was diverted for hydroelectric purposes. Without these minimum flows, important fisheries resources cease to exist; and whereas, this ruling based on the precedent case First Iowa Hydroelectric Cooperative versus Federal Power Commission (FPC) limits the states' ability to have FERC act in conforming to the state law despite the requirement of Section 9 of the Federal Power Act (16 USC 821) that the applicant for a license from FERC submit evidence of compliance with state laws; and whereas, state sovereignty over public trust resources is a cherished institution in American law, and undue limitation of the states' exercise of police power concerning the public trust should be avoided; and whereas, Section 27 of the Federal Power Act provides that the Act not "be construed as affecting or intending to affect in any way to interfere with the laws of the respective states relating to the control, appropriation, use, or distribution of water used in irrigation or for municipal or other uses, or any vested right acquired therein" but in the opinion of the Supreme Court fails to extend such vested rights to water required by fish and wildlife on the grounds that these are not proprietary rights; and whereas, House Resolution 4921 would amend the Federal Power Act to allow states to enforce laws "relating to water or water rights, whether or not regarding proprietary rights" in the FERC licensing process as part of Section 27 of the Federal Power Act and would direct FERC to proceed with licensing in conformity with such state laws; and therefore be it resolved

that the Association of Midwest Fish and Wildlife Agencies supports passage of House Resolution 4921 and encourages the support of Midwestern states affected by the hydroelectric licensing process.

Do I have a move to adopt? Michigan, question?

COMMENT. I guess I would like to also suggest that we add, I'm looking for the right language here, "Therefore be it further resolved that the Association of Midwest Fish and Wildlife Agencies refers this resolution to the International Association of Fish and Wildlife Agencies for adoption at its annual meeting in New Orleans, Louisiana, in September of 1990."

DICK PIERCE. OK. So you moved to add the last paragraph of the previous resolutions to this one?

COMMENT. Yes.

DICK PIERCE. OK. Discussion on that? South Dakota?

COMMENT. There's a question on the last "therefore" where it says, "onto the support of all Midwestern states." Why did you limit yourself just to Midwestern states there? It seems to me that would be a good resolution for all states. Just strike "Midwestern." It would be limiting.

DICK PIERCE. OK. So you're saying we encourage the support of all states? Strike the word "Midwestern?" Discussion on that? Any other additions or corrections? OK. With the resolution with the changes of adding the last paragraph of previous resolutions and with striking the word "Midwestern" in the printed last paragraph, do we have a move to adopt? Move by Colorado. Second by Kentucky. Discussion? South Dakota?

DOUG HANSEN. For adoption here, I think that one of the places absolutely . . . . (Inaudible)

DICK PIERCE. Make that in a form of a motion or just put that in the minutes?

DAVID HALES. I agree we just put that in the minutes as a matter of distribution. In fact, I would assume that there be a number of entities interested in distributing it once we pass it. I know there's a list that we'd talked about which was certainly started in Michigan at the congressional delegation. Should this and a number of others pass, we might want to distribute this.

DICK PIERCE. That'll be fine.

DAVID HALES. And that certainly adds any and all suggestions to that list of distribution.

COMMENT. That would be true and Resolution No. 2, for example, too.

DAVID HALES. I don't know how you normally do that, but I would assume that if someone wants a formal communication of the resolution, that any state just get in touch with John, and he can do that on behalf of the Association. It's a resolution that we've all passed. We're not keeping secrets.

DICK PIERCE. Further discussion? OK. All in favor, signify by saying, "I." Opposed? Motion passed.

And finally Resolution No. 5--Whereas, Director David Hales and his associates of the Michigan Department of Natural Resources, Bureau of Resource Management, Division of Fisheries, Law Enforcement, and Wildlife, have provided members of the Association in an outstanding program and display of Michigan diversity and hospitality; and now, therefore, be it resolved that the Association of Midwest Fish and Wildlife Agencies assembled at its annual meeting in Grand Rapids, Michigan, July 16 through 18, 1990, commends and thanks David and his associates of the Michigan Department of Natural Resources, Division of Fisheries, Wildlife, and Law Enforcement, for organizing and conducting a most successful 57th annual meeting.

Do I have a move to adopt? So moved by Indiana. Seconded by Kansas. Any discussion? I, for one, think that we've had a great time and think that they deserve a round of applause. All in favor, signify by saying, "I." Opposed? Thank you. Thank you, Mr. President.

DAVID HALES. We are well ahead of schedule. We have to adjourn now for a group picture during our break. I've about 10:15. Why don't we reconvene at 10:30, but immediately as we break. You want to convene where, Rex?

REX SCHMELER. (Inaudible)

DAVID HALES. Directly to the fountain right now and then break. Then we'll come back for the next item on the agenda at 10:30.

If we come back together and drink coffee while we're working, I would bet that we could move out of here in about another 15 to 20 minutes to complete the business session. Anybody opposed? All right. We're off and running.

The first item after the break is the report from the Nominating Committee, and I'll call on Don McCormick. You're doing that instead? All right.

JOHN URBAIN. Yes, sir. I'm substituting for Don McCormick because he had to catch an early flight. After due deliberation, the Nomination Committee is recommending for President, Doug Hansen from South Dakota; Vice President, Steve Wilson from Arkansas; Secretary-Treasurer, John Urbain from Michigan; and the immediate past President David Hales from Michigan.

DAVID HALES. Maybe we ought to call to see if there are any other nominations from the floor. We have a motion to nominate or to accept the recommendation

of the Nominating Committee and elect the officers as read by the Executive Secretary. We have a motion from Colorado. Got a second from Illinois. All in favor? All opposed? And that does it, doesn't it?

Now we next call on Art. Well, this looks like we're going to be a South Dakota thing for a moment. Art, you're up for awards. Is that right?

ART TALSMA. Our Awards Committee met by phone call mostly, and I did want to talk just a little bit about a couple of potential awards that we may award next year. I want to have some thinking on this through the year's time. Perhaps we don't even need to record this part in the session, so we can perhaps sneak up on these folks next year.

Nebraska's had Bill Bailey, a longstanding member of our committee and the Midwest and very active on the International committees as well. We talked to them a little bit about what his anticipated retirement date was and so forth. We're looking at awarding Bill some kind of recognition next year in South Dakota, if that's OK with you folks. He was not able to make the meeting but wanted to come out, so we did check on that.

Another thing that we talked about was perhaps giving recognition to the Habitat Committee for all of their work that they did, especially the Midwestern states, through the International. By next year, the 1990 Farm Bill will perhaps be in place and a little bit more secure. We wanted to recognize Al Ferris from Iowa and all the people in the Midwest that really spent a lot of time on the Farm Bill, so you may want to give some thoughts toward that next year as well.

The one award then that I would like to present is to President David Hales. Just as a little bit of an introduction, we had the planning session the other day. I don't want to go into a lot of detail about the previous life of David Hales, but I did find a few things about him. I just came across a note that he had left lying on the table after the planning session. It took a little while to decode this note. It only had four points on it. They go as follows: No one taller, faster elevators, nuclear waste to South Dakota, and planners and lovers.

I got with Pat and a few other people on this staff, and we put the note into the "think tank," and we have decoded it now. No one taller, means Dave doesn't want anyone in his personnel section to hire anyone taller than he, so that's a pretty easy accomplishment for a goal. Faster elevators, if you don't know, he's a person that likes to speed around at times, and he wants to convert some of his freight elevators into faster elevators in the Mason Building. Nuclear waste in South Dakota, he was overheard saying that South Dakota really doesn't have any people. They won't notice if we send nuclear waste that way, and that was his plan there.

DAVID HALES. That's not true, Doug.

ART TALSMA. In planners and lovers, he made the comment that planners are like the proverbial lover that knows how to make love 99 different ways but has no girlfriends, so we know . . . . (Inaudible)

And, I think along with this recognition and award when we gave the applause, Michigan did an absolutely excellent job. I'm sure Dave will comment, but I want to recognize John and Rex for all the outstanding work they did. We had excellent tours and just a top-notch meeting all the way around, so I'd like to present David Hales with the "Midwest Association Quacker Award," a very nice plaque. Maybe you should stand to the side of the mike.

DAVID HALES. Probably should.

ART TALSMA. Congratulations.

DAVID HALES. Thank you very much. This is the easiest award I've ever won because I didn't do anything to deserve it, and let me redirect your attention to John Urbain, Rex Schmeler, and come if you will, as well, Joan Duffy. Stay here a moment, Rex. One of the things you have in front of you is a little pin. We had these made as there aren't very many ways you can say "Thank you" in government.

One of the things that I do is we have the pin that's different from the Department pin that I use to thank people when they've made a really excellent contribution to the organization. You've gotten one before, but you have another one now, Joan. Thank you.

These are the people that made that contribution. You've met so many of them, and I assure you that Jack Bails and Karl and John Robertson and I will be sure that each of the folks who did such a great job of either preparing and presenting a paper or participating in a tour receive our thanks and congratulations because we're really proud of them. I think you can see why we are.

With that, Doug, if you would come up and join me, well, I guess we can't. Do we formally transfer this now? We still have some new business to do in a minute, right? Well, I'm going to do that.

JOHN URBAIN. You can. You're still active for 30 days after the date of the meeting.

DAVID HALES. Oh, well, we'll symbolically transfer this. Let's walk over here. On behalf of the Association, we want to present you with this picture and the gavel and . . . and tell you that we're looking forward to coming to South Dakota.

By the way, please, there's a box by the door for all the participants to get a copy of the same print. Yours didn't get framed. You'll have to frame your own.

DOUG HANSEN. As you probably know, it's been a very exciting experience for me. This is my first Midwest meeting. I wasn't sure what to expect, but I see it operates similar to other organizations I belong to. You take the newcomer and make him President, so I'm glad it's kind of a down-to-earth

group anyway. I look forward to the coming year. I think Michigan certainly set a high standard for South Dakota to follow, and I feel confident that we can follow.

We have lots of different heritages and issues and cultures to show you when you come to South Dakota, and we're excited about lining up the program to do that. We have discussed some various options. Art and I have talked about this, and we've gotten some input from some of you. We have considered a couple options as far as a meeting place--Pierre, South Dakota, and Rapid City being those two. It seems the consensus that I've been able to gather is that Rapid City would be an appropriate location, and we're leaning that way. Unless we hear any strong objections, I think we would propose to hold the meeting next year in Rapid City. We have a number of environmental-related programs and sights to see in that area. Also it's a great tourist area. We invite you to bring your families and wives. There are lots of sights and lots of things to do and see.

As I've been in this position, I guess one thing I've noticed is the issues that we deal with in our own state are fairly common issues with other states also, and we're certainly no exception. I've heard several things that rang a bell with our issues that we deal with, and so I think we can develop a program that will share those and be very valuable to all of us.

If there are any comments on meeting location, I would appreciate hearing them; otherwise, we'll proceed, tentatively anyway, with Rapid City. We have contacted a number of hotels.

Art, you can add anything you like. It appears that things will be set. Anything else? OK. Thank you very much.

DAVID HALES. If there's any old business to be taken from the table and brought before the Association, the floor is open to that at this time. Seeing none, we'll turn to the "New Business" section of the agenda.

There's one item already on the agenda which concerns the appointment of a Midwest representative to the Planning Committee, and Roger Holmes has comments and recommendations on that.

ROGER HOLMES. Thank you, Dave. I believe we were asked by the Committee to just comment on the Responsive Management Program that was developed by the Western Association, and Director Larry Shannon got the State of Minnesota involved with that. I'm not sure if there are any other states in the Midwest that have been involved. Yes, Colorado was involved. The Program is excellent. It is a package that was developed to provide us with tools primarily to survey our clientele that use the wild-living resources. It's a package that I know all the states would find very useful. It's a lot cheaper to be involved through the Responsive Management approach than to contract independently. We heard two presentations on it this last spring at the North American in Denver from the states Louisiana and California. They were very, very pleased with the product.

I recall a comment by Virginia VanSickle of Louisiana that she felt using the Responsive Management package saved her state over a $100,000 as opposed to contracting for the service from some other source. The point here is that the person who served on the Responsive Management Board from Minnesota, named Wilma MacKenzie, is no longer in DNR in Minnesota so is no longer on the Board. They are looking for a replacement. If any state has a person who's particularly interested in this sort of thing that would bring some expertise to the Board, I would encourage you to suggest a name. The fact that someone from Minnesota was involved was very helpful to us in being involved with the Responsive Management Program.

I noted that in the discussion on Tuesday evening, there was quite an emphasis on getting public input which is very important in the conference planning process. I would encourage any state that is just getting involved with that to suggest someone to serve on the Board that might have a particular interest in general information obtaining input from the public planning. Why, you'd find it very worthwhile.

I guess that's all I would have on it. John do you want to see if there are any questions?

DAVID HALES. Roger, do you wish to make those corrections . . . . (Inaudible)

ROGER HOLMES. Well, whom did you get the inquiry from?

DAVID HALES. From the Western.

ROGER HOLMES. OK, through John?

DAVID HALES. Yes. Let's make suggestions to John.

ROGER HOLMES. Good.

DAVID HALES. What we'll do is take those and make recommendations onto you. Let me propose this. That if it meets with your approval, what we could do is take any suggestions from states and then make those available to Doug and make sure that we have people who are willing to serve in lead responsibilities. Then Doug can make the appointment from the Midwest.

ROGER HOLMES. It would be good. Surely.

COMMENT. Do you have any idea of what type of time commitment?

DAVID HALES. They're calling for four meetings a year plus some work between meetings. Probably the most serious constraint would be out-of-state travel monies done in order to serve the position. I know that would be a real constraint on us and obviously on most states, maybe all states.

COMMENT. The national across the board?

COMMENT. Yes.

DAVID HALES. Jerry Conley is the President of the Western. He's also on the Planning Committee, right? I noticed heads nodding. It's all right if we handle it that way as there's no objection to it.

Are there other items of new business that need to come before the Association at this meeting?

KEN BABCOCK. Just an item, and I really don't know if it is the best way to approach . . . its entirety might be given some thought to, and that is that I've been coming to these meetings for close to ten years now, off and on. It appears to me that we've allowed the business level of our agenda, maybe, to deteriorate a little bit in terms of, particularly, quantity and, possibly, even some of the items that we should be dealing with.

I, for one, would encourage this association to maybe step back and take a look at itself. We have a lot of horsepower, in my view, in the natural resource field in the Midwest and in this association, but I think if you'll look around to the attendance at this meeting and attendances at recent meetings, we have states that are absent, and we have states that are sending representatives instead of their Director. We have states, such as Missouri, that used to send four or five people to this meeting, but as we've gotten to the point where out-of-state travel has become restricted, this obviously is a meeting that we don't send as many people to anymore. I think that it's time for this association to kind of step back, take a look, and see if there's a way we can regenerate a little enthusiasm and a little bit more activity on the business end of things.

Missouri is a member of the Southeastern Association as well as the Midwest, and a meeting was held in May with about a day and a half of full business. There are technical committees that work for that association and bring reports and recommendations. Each and every one of the Directors that are members of that association has some task force or some standing committee for which he is in charge, and there are just a lot of things that are going on.

Interestingly enough, we probably find a lot more things in common with the Midwest than we do the Southeast, but at the same time, the Southeastern certainly does take advantage of the time of the meetings that they have. They have a fall meeting of the Directors that's usually a half of a day of full business, and I just think that it would be time for this group to step back. My Director is not here. There are many Directors that aren't. I'd like to see the business end of things be given a little bit more priority on the agenda, and I think we'll see a rejuvenation of attendance and activity.

DAVID HALES. Further comment? South Dakota?

ART TALSMA. Well, I've attended about five in a row now, and I second Ken's comments. I think one of the things that we can think about doing in South Dakota as we host the meeting next year is, perhaps, get into a program and still deal with some more issues and dramatic things that are of importance to the Midwest. One example, of course, that you dealt with here

at this meeting that was very good is the habitat components that deal and relate to the Farm Bill, things like the CRP Program and what's its effect on wildlife.

Another one that I can think of, that we'll probably address next year that Doug and I've been talking about, is the native American hunting and fishing rights. South Dakota is a very good state to host something like that because we have about nine tribes right there in our state. Those are some of the issues then that maybe if we make our program a little bit more adaptable and issue-related, it would lead to a good productive business session following, that Ken's talking about. So we can really get in there and make some better recommendations back to the International. I know the International. I think maybe we could get George to comment, but I think the International would like to see us be a little bit more helpful too in some of their areas.

DAVID HALES. Bruce?

BRUCE MCCLOSKEY. From Colorado's perspective, we also participate in the Western, and I think it must be very similar to the Southeastern. I would support the comments that we could certainly make better use of the horsepower that we have. One specific thing that I would suggest for South Dakota next year that would be very helpful, from my perspective, would be if each state were allowed the opportunity to make a very brief five-minute presentation on some current events. I think we all find out in the evenings and at the hospitality hours that we do, in fact, have a lot of common problems, and I think that we may be reinventing the wheel in 10 or 15 different states. We could save ourselves some time if we just communicated that a little more formally than we have by way of a specific suggestion.

DAVID HALES. Excellent point. I'm noticing most of the heads nodding as we're talking about this. Perhaps one thing, Doug and Art, that you might consider as you're putting together your focus, whether it's habitat or native American issues, would be including participation from states when you do a panel so that all the presentations aren't just from the home state, but that some of us are able to bring some cross fire into that.

I know that I can say this from Michigan's perspective. I enjoyed and was very proud of the presentations here, but I would have liked to have had some time, as well, for us to hear the kind of presentation that you're talking about in a formal way, rather than just the informal conversation. I think that's an excellent suggestion as well.

COMMENT. I think that Ken's comments were very well put. Either Ken or Art mentioned the idea of standing committees, and we do have the provision for that? I think for the next meeting that I would ask that that be considered, and that some standing committees be formed with chairs appointed to address some of these common problems that the 14 states deal with.

DAVID HALES. Excellent suggestion. Are there any other comments or suggestions? Doug, you're going to get some help. Lorne, comment?

LORNE COLPITTS. Well, since I've been participating since 1985, I know there has been difficulty in getting Ontario and Saskatchewan to participate. We deal much more frequently with Saskatchewan than Ontario. Some of the people are doing interpretive International work with the North American Waterfowl Plan. I know some of the staff in Manitoba are heavily involved with the International and the Animal Rights Committee. Perhaps, those two themes, in particular, may be an opportunity to get Ontario and Saskatchewan participating more regularly.

I spoke to John yesterday about possibly getting Saskatchewan's participation, and perhaps, some personal contact with the Director up there would be successful in doing that. Dennis Sherratt from Saskatchewan, you know, has a fair number of contacts in the U. S. through the North American Waterfowl Plan, and I think that we could easily get them involved and in a position to host this meeting in the not-too-distant future.

DAVID HALES. Great! Other comments? Bruce?

BRUCE MCCLOSKEY. I think the majority of the attendants probably attend the North American meeting. If it would be possible to have a draft agenda or a layout by the North American meeting, that might be the time to give a little pep talk, a little tease, on what the July meeting might be about. It might help mark some calendars.

DAVID HALES. Doug?

DOUG HANSEN. According to bylaws, are standing committees appointed by the President?

DAVID HALES. It's my first meeting, as well, so I'll turn to John and get an answer to that.

JOHN URBAIN. Yes, the committees are appointed by the President.

DOUG HANSEN. OK.

DAVID HALES. OK. Ken, thank you. I think there was substantial support, and it was a timely intervention on your part to bring that to the floor.

KEN BABCOCK. Just one final comment. Since a lot of the Directors are not represented here, just a brief survey of the Directors with regard to their attitude or what they want to see out of this association may well be in order as well. But, there's nothing wrong with having representatives for Directors at meetings. I appreciate the opportunity to come, but at the same time, I think if that's what the Directors in this association are looking for, some continuity. You know. I'm here as a representative now, but maybe I wouldn't be next year. Should I be on committees? Should I not be? Maybe the Director should make the final judgement on that with regard to the direction the Agency ought to go.

DAVID HALES. Further comments on this subject? Other items that need to come onto the floor as new business? One more, Ken?

KEN BABCOCK. It's just one more. This is concerning what Marvin Moriarty mentioned earlier. I think he made some reference to a joint venture, and I know that there was a new joint venture that has been, at least, in the discussion stage--the Great Lakes and Upper Mississippi River Joint Venture. I wonder if somebody from the Service could maybe update us as to what progress has been made in that regard, and is it timely that maybe this association through its President notify the Fish and Wildlife Service of our support for formally forming that joint venture?

COMMENT. The proposal has been put together. It's been reviewed by the Flyway Council one time and was approved. We got comments back and have refined the original proposal. It was resubmitted to the Council again two weeks ago, and if everything goes as we expect it to go, it'll be submitted to Washington shortly thereafter. Right now, it's in the budget process to get started in Fiscal Year 1992, so that's where we are right now, and it looks pretty good.

DAVID HALES. That's a step towards a motion of support from the Association for the Joint Venture.

KEN BABCOCK. As I was told through the . . . President notify the Director of the Fish and Wildlife Service. Is that the appropriate avenue? John, should this be directed to John Turner, the Director?

Notify by letter that the Midwest Fish and Wildlife Agencies supports the concept of formally establishing the Joint Venture involving the Great Lakes and the upper Mississippi.

DAVID HALES. Second?

COMMENT. I would like . . . the president of the North American Plan . . . . (Inaudible)

DAVID HALES. You may when we get a second. We'll get a second from Minnesota. Thank you, Roger. The suggestion is now in order and is taken. Other comments? Hearing none, all in favor? Any opposed? None? Carries.

Other items of new business to come onto the floor? Roger?

ROGER HOLMES. There were some comments made this morning. I think Marv Moriarty commented on them regarding the Federal Aid Renovation Plan, and that involves the states in Region 3. There's going to be a meeting on November 8, as he mentioned in, is it St. Louis? Is that right, Bob?

BOB LANGE. No, Springfield, Missouri.

ROGER HOLMES. Oh, Springfield, Missouri. All right and I would just like to raise that point again because I've seen a draft of some correspondence that's coming out to the states and the Region. I thought that perhaps this would be a good form for maybe planning some kind of a short meeting on this in September in New Orleans because Bob Lange is asking that the various states

September in New Orleans because Bob Lange is asking that the various states assume or take certain segments of the Renovation Plan under their wings. I think that'd be worth some preliminary discussion and planning, if that would be helpful.

DAVID HALES. Surely.

BOB LANGE. Whenever I talk to any of the states, I get a strong sense that the Federal Aid Program doesn't do for them all that it could do. I am in the position of managing the Federal Aid Program from the federal side for the Feds, and I am openly saying that I would like to be a part of a process with states managers to identify what you would want differently out of the Federal Aid Program in the eight states that are in Region 3 of the Service. We will change the Program to meet your needs, but it can't happen because I come up with some ideas. It'll only happen if we can get management levels of the various agencies interested enough to identify what needs will help make the Program more responsive and more adaptive to them.

Now the states have gone a very long way, since October in Sandusky, Ohio, and since January in Indiana, in identifying the kinds of things that they would like to change and specifically in identifying some recommendations for improvement. Now I need, and I think you need, a management commitment to get involved with, OK, "How does this translate into allocation of resources and staff time?" "What are we going to change to do differently from what we've done in the past?" And, I want to work for and with the eight states in Region 3 to do that.

In Springfield, Missouri, on November 8, we were going to have a management level group meet for the second time to begin to specifically talk about how we're going to implement those recommendations. I would like to have a management level designate named by each of the eight states so that I would know whom I was working with. At that point, then we could move forward in changing this program to make it responsive and adaptive.

ROGER HOLMES. The point I was making on that, Bob, is that some of those comments were made this morning, but I wanted to raise the possibility of people at the Director's level meeting prior to November 8 in New Orleans. I would expect that many or most of the Directors will not be at the Springfield meeting, and if you think that would be helpful, why . . . . (Inaudible)

BOB LANGE. I believe that would be helpful . . . . (Inaudible)

ROGER HOLMES. I believe they would. Then so that'd be a perfect opportunity, and I know I'd be interested in that. I don't know if I'll be at the Springfield meeting or not. I probably won't be. I probably will be deer hunting, so I think that it'd be very helpful to me and probably some of the others. Maybe we could discuss that later and maybe organize some kind of luncheon get together or something in New Orleans.

BOB LANGE. What would you like from me in order to make that happen? A letter to the eight states? The names and time and place and the subject?

DAVID HALES. That's as good of a mechanism as any. I mean we'll be there, and we'd be glad to attend that meeting. If you wanted to take the initiative to find a place and suggest a time, that would be a good action-forcing device for Michigan, particularly, if you focus, perhaps, on a noon or breakfast meeting where it wouldn't conflict with the rest of the schedule.

Other comments? Art?

ART TALSMA. Is the same activity paid twice in the other regions? Do you know?

BRUCE MCCLOSKEY. No. We have the same need. We've verbally said it many times and went back and forth with our Denver Office several times. You may even want to include the invite to all the states and provinces.

COMMENT. When we have met, each time we have invited the other regions and the International to send representatives, and some of the other regions have come to those meetings. A lot of the other regions are saying that our region has been a little bit more scrutinizing in certain regions over yours. Perhaps we need something that some of the other regions don't need, and sometimes we're in no position to tell the other regions what they need and won't need. It's time to address what we can do to work for the states and for the states in our region.

DAVID HALES. Well, I would assume there wouldn't be any objection though, if any state member of this association wanted to attend that meeting. That might be a start for those of you who work from different Fish and Wildlife Service regions, and then there may be something there you want to take back.

COMMENT. I think it'd be kind of neat if something rubbed off.

DAVID HALES. Roger?

ROGER HOLMES. I don't hear any disagreement anyway, so could you check with someone in the Institute as far as the scheduling on that? There are many things going on, but maybe then once the states see what the best time would be, they could arrange something.

DAVID HALES. I could do that. Let me hear a little bit more characterization of the meeting. Is it a meeting of the Directors or Deputy Directors or Representatives from the Eastern states about how we can manage the change of the Federal Aid Program together, or what did you need?

ROGER HOLMES. I think it would be primarily the Director so that we can get a better understanding of what's happening as far as Federal Aid renovation and which states are interested in doing what. Now, I don't think that letter's come out yet, but you've gotten categories there for different states. I recall from Minnesota we're to take the lead on some endangered species work which is fine, but I think it'd be worthwhile to have the states discuss those ideas to see if some other state would prefer to do that and who wants to do what--this sort of thing.

COMMENT. Yes, this is not "big brother" telling the states what to do. There's been some process of discussion, and some meetings have already occurred but everything from a draft stage. Now, I mean I would be more than willing to have the states grab the ball and tell me who wants to do what, but I . . . . (Inaudible)

ROGER HOLMES. At this point, that's why I'm suggesting that, I think, Director input would be helpful to you and good for each of the states.

COMMENT. OK. I have . . . . (Inaudible)

DAVID HALES. Great! George, do you have a comment?

GEORGE LAPOINTE. (Inaudible)

DAVID HALES. OK. Other items? Just in case anybody's shy, we'll wait a couple seconds, all right? Good. One more? I knew there was one more.

GEORGE LAPOINTE. I send greetings to the group from Larry Shannon. I talked to him on Monday, and he asked that I greet all of you, so I do that.

DAVID HALES. And on behalf of the Association to him and to Max, please carry our greetings back to them. We'll look forward to seeing them next year at the meeting and certainly in New Orleans. We miss them.

Last item? Last chance. Going once, twice. May I adjourn the meeting? Do you have any formal announcements you need to make as to next times, places, or activities? Then the meeting is adjourned. Thank you very much.

ASSOCIATION OF MIDWEST FISH AND WILDLIFE AGENCIES
1990 FARM BILL
RESOLUTION NO. 1

Whereas, the majority of our midwest fish, wildlife, and native plant resources are directly affected by the management of private lands; and

Whereas, farmers or agricultural producers are the primary private land managers in the midwest; and

Whereas, the 1985 farm legislation contained major conservation provisions that began to improve management of soil and water resources that directly benefited our fish, wildlife, and native plant resources; and

Whereas, these conservation provisions need to be continued and improved upon to better protect and enhance our fish, wildlife, and native plant resources; and

Whereas, Congress is developing new farm legislation for the 1990s, and the future status of our fish, wildlife, and native plant resources is dependent on the content of this legislation; and

Whereas, it is essential for the Association of Midwest Fish and Wildlife Agencies to provide recommendations and input on the new farm legislation so that fish, wildlife, and native plant resources are protected and enhanced; and

Whereas, an important strategy for providing these recommendations is through the use of the Wildlife Management Institute; and

Now, therefore, be it resolved that the Association of Midwest Fish and Wildlife Agencies fully supports continuation of the development of a sound conservation ethic in the 1990 Farm Bill including establishment of a multi-year set-aside and continuation of the Conservation Reserve and Swampbuster; and

Be it further resolved that the Association of Midwest Fish and Wildlife Agencies refer this resolution to the International Association of Fish and Wildlife Agencies for adoption at its annual meeting in New Orleans, Louisiana, in September 1990.

ASSOCIATION OF MIDWEST FISH AND WILDLIFE AGENCIES
HUNTING, FISHING, AND TRAPPING
ON THE NATIONAL WILDLIFE REFUGE SYSTEM
RESOLUTION NO. 2

Whereas, the United States Congress is considering H.R. 4948, the National Wildlife Refuge Systems Act of 1990, to amend the National Wildlife Refuge System Administration Act of 1966; and

Whereas, the United States Fish and Wildlife Service currently has authority to properly manage the national refuge system and has done so in a commendable manner; and

Whereas, this legislation infringes on the basic sovereign responsibilities of the states to manage resident fish and wildlife; and

Whereas, this legislation fails to recognize hunting, fishing, and trapping as legitimate uses of national wildlife refuges; and

Whereas, the Secretary of the Interior arbitrarily closed the Sleeping Bear Dunes and Pictured Rocks National Lakeshores to trapping, on the basis that trapping was not specifically authorized in legislation, even though the State of Michigan conveyed land to the U.S. Department of the Interior with the explicit understanding that the state would retain the right to manage wildlife resources, including hunting and fishing, and that by state statute hunting has been synonymous with trapping in the management of wildlife; and

Now, therefore, be it resolved that the Association of Midwest Fish and Wildlife Agencies on July 19, 1990, strongly urge the United States Congress to explicitly protect the right to hunt, fish, and trap within our national wildlife refuge system and that any legislation governing our national wildlife system must fully recognize the states' appropriate role and right to manage fish and resident wildlife, and must recognize hunting, fishing, and trapping as legitimate uses of national wildlife refuges; and

Be it further resolved that the Association of Midwest Fish and Wildlife Agencies refer this resolution to the International Association of Fish and Wildlife Agencies for adoption at its annual meeting in New Orleans, Louisiana, in September 1990.

ASSOCIATION OF MIDWEST FISH AND WILDLIFE AGENCIES
INTRODUCTION OF HARMFUL ORGANICS WITH DISCHARGE OF BALLAST WATER FROM OCEANGOING VESSELS ENTERING THE GREAT LAKES
RESOLUTION NO. 3

Whereas, exotic organisms such as the Chinese mitten crab, spiny water flea, ruffe, zebra mussel, and tube nose goby are being introduced with discharge of ballast water from oceangoing vessels entering the Great Lakes, and such introductions of harmful organisms threaten to disrupt native ecosystems through predation, competition, infection, genetic effects, and habitat degradation; and

Whereas, one thousand overseas vessel trips, 39% in full ballast (i.e., carrying ballast water in cargo holds as well as in dedicated ballast tanks), are recorded in a typical year for the Seaway, each carrying up to 1.25 million gallons of water and thousands of live exotic organisms; and many thousands more overseas vessel trips are recorded for ports in fresh and brackish waters connected to the Great Lakes such as the Hudson and St. Lawrence Rivers; and

Whereas, many exotic organisms such as the spiny water flea, zebra mussel, and ruffe will spread inland from Great Lakes footholds in North America, and

Whereas, it is not practical to eradicate invading organisms once established in the large open systems such as lakes and rivers; and

Whereas, a single exotic species, the zebra mussel, could cost society $4 billion in the Great Lakes basin alone; and

Now, therefore, it is resolved that the Midwest Fish and Wildlife Agencies meeting on July 19, 1990, in Grand Rapids, Michigan, recommends that the discharge of ballast in the Great Lakes be regarded as a privilege granted only to those ships taking reasonable precautions in order to protect other uses of North American freshwater, including drinking water, power generation, and recreation; and

It is also resolved that the Governments of the United States and Canada should enact, without delay, the legal instruments necessary to prevent ballast-borne exotic organisms from entering the Great Lakes or connected fresh and brackish waters such as the Hudson and St. Lawrence Rivers (e.g., the United States' Title I of S2244/HR4214, the Nonindigenous Aquatic Nuisance Act of 1990); and

It is also resolved that the Governments should provide their Coast Guards with adequate resources to develop, implement, monitor, and enforce required measures; and charge their Coast Guards to coordinate and integrate U.S. and Canadian ballast exchange programs as fully as possible, for purposes of standardization, enforcement, and monitoring, pursuant to the Great Lakes Water Quality Agreement; and

It is also resolved that the Governments of the United States and Canada should instruct their national delegations to provide leadership and multi-disciplinary expertise (e.g., ecologists, oceanographers, water treatment specialists, naval architects) to the International Maritime Organization of the United Nations in order to foster recognition of the global problem of ship-mediated introductions, and to develop standardized comprehensive strategies for its resolution; and

Be it further resolved that the Association of Midwest Fish and Wildlife Agencies refer this resolution to the International Association of Fish and Wildlife Agencies for adoption at its annual meeting in New Orleans, Louisiana, in September 1990.

ASSOCIATION OF MIDWEST FISH AND WILDLIFE AGENCIES
SUPPORT FOR H.R. 4921
AN AMENDMENT TO THE FEDERAL POWER ACT OF 1920
RESOLUTION NO. 4

Whereas, the U.S. Supreme Court ruled, in California vs Federal Energy Regulatory Commission (FERC), that the State could not use its police powers to impose minimum stream flow requirements to protect fish in a stream from which water was diverted for hydroelectric purposes. Without these minimum flows, important fisheries resources cease to exist; and

Whereas, this ruling based on the precedent case First Iowa Hydroelectric Cooperative vs Federal Power Commission (FPC), limits the States' ability to have FERC act in conformity to State law despite the requirement of Section 9 of the Federal Power Act (16 USC 821) that the applicant for a license from FERC submit evidence of compliance with State laws; and

Whereas, State sovereignty over public trust resources is a cherished institution in American law and undue limitation of the States' exercise of police power concerning the public trust should be avoided; and

Whereas, Section 27 of the Federal Power Act provides that the Act not "be construed as affecting or intending to affect in any way to interfere with the laws of the respective States relating to the control, appropriation, use, or distribution of water used in irrigation or for municipal or other uses, or any vested right acquired therein" but in the opinion of the Supreme Court fails to extend such vested rights to water required by fish and wildlife on the grounds that these are not proprietary rights; and

Whereas, HR 4921, would amend the Federal Power Act to allow States to enforce laws "relating to water or water rights, whether or not regarding proprietary rights" in the FERC licensing process, as part of Section 27 of the Federal Power Act, and would direct FERC to proceed with licensing in conformity with such State laws; and

Therefore be it resolved that the Association of Midwest Fish and Wildlife Agencies supports passage of HR 4921 and encourges the support of all States affected by the hydroelectric licensing process; and

Be it further resolved that the Association of Midwest Fish and Wildlife Agencies refer this resolution to the International Association of Fish and Wildlife Agencies for adoption at its annual meeting in New Orleans, Louisiana, in September 1990.

ASSOCIATION OF MIDWEST FISH AND WILDLIFE AGENCIES
RESOLUTION NO. 5

Whereas, Director David Hales and his associates of the Michigan Department of Natural Resources, Bureau of Resource Management, Divisions of Fisheries, Law Enforcement, and Wildlife, have provided members of the Association an outstanding program and display of Michigan diversity and hospitality; and

Now, therefore, be it resolved that the Association of Midwest Fish and Wildife Agencies assembled at its annual meeting in Grand Rapids, Michigan, July 16-19, 1990, commends and thanks David and his associates of the Michigan Department of Natural Resources, Divisions of Fisheries, Wildlife, and Law Enforcement, for organizing and conducting a most successful 57th annual meeting.

ASSOCIATION OF MIDWEST FISH AND WILDLIFE AGENCIES
RESOLUTION NO. 5

Whereas, Director David Hales and his associates of the Michigan Department of Natural Resources, Bureau of Resource Management, Fisheries, Law Enforcement, and Wildlife divisions, have provided members of the Association in an outstanding program and display of Michigan diversity and hospitality;

Now, therefore, be it resolved that the Association of Midwest Fish and Wildlife Agencies assembled at its annual meeting in Grand Rapids, Michigan, July 16 through 18, 1990, commends and thanks David and his associates of the Michigan Department of Natural Resources, Bureau of Resource Management, Fisheries, Law Enforcement, and Wildlife divisions, for organizing and conducting a most successful 57th annual meeting.

Association of Midwest Fish and Wildlife Agencies

REPORT OF THE TREASURER

Grand Rapids, Michigan
July, 1990

Balance of assets brought forward from 1988--$13,914.46

Total receipts for the business year 1989, including dues from 18 members and interest on cash management account--$2,573.79

Total expenditures for the Duluth, Minnesota, conference--$500.00

As a result of the 1989 business meeting, $2,500.00 was transferred from the checking account to the cash management account, and $5,000.00 was provided to the Wildlife Management Institute.

Engraving for Association awards was $6.61, and printing 55 annual proceedings was $936.01.

The status of the Association's funds at the close of business for the year of 1989 relates total assets of $10,045.63.

Balance of the 1989 checking account forwarded to the 1990 account--$3,477.05.

Balance of the 1989 cash management account forwarded to the 1990 account--$6,568.58.

The official Association financial ledger showing receipts and expenditures has been made available to the audit committee.

John W. Urbain, Treasurer (1989)

Association of Midwest Fish and Wildlife Agencies

TREASURER'S REPORT

1989 Transactions

Total Assets beginning January 1, 1989		$ 13,914.46
Receipts 1989:		
Annual dues	$ 1,800.00	
Interest on cash management account	773.79	2,573.79
Total Available Assets		$ 16,488.25
Disbursements 1989:		
Association advance to Minnesota	$ 500.00	
Omni Press (55th Annual Proceedings)	936.01	
Melville Emblem	6.61	
Wildlife Management Institute	5,000.00	6,442.62
Accounting of Assets, December 31, 1989:		
Cash in checking account	$ 3,477.05	
Cash Management Account No. 1212990-4750 . .	6,568.58	10,045.63
Total Assets, December 31, 1989		$ 10,045.63