Box 1, Folder 7: Clippings, 1977-1988 [and undated]. 1977-1988

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Ca. 1980

NEWSLETTER
HIAWATHA NATIONAL FOREST
MUNISING DISTRICT
P.O. Box 160
Munising, Michigan 49862
906-387-2512

The fisheries program on the Munising District is now three years old. This program has channeled efforts into lake and stream habitat improvement. A good working relationship has been developed with the DNR, and we are pleased with some of our accomplishments.

This winter we are preparing management plans for some of the waters that have recently been surveyed. For your interest we have briefly summarized these survey results and would like your input as management plans are being prepared. Please direct your comments, both good and bad, to us or the the Michigan DNR at Newberry or Escanaba.

Hovey Lake (T45N, R19W) 99 acres

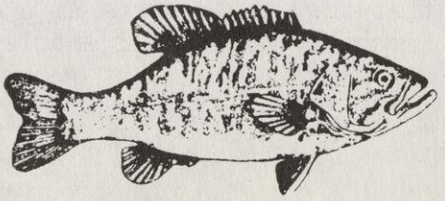
A 1978 survey of Hovey Lake showed the fishery to be in bad shape. 77% of the total weight of test netting results consisted of small pumpkinseeds and yellow perch, 20% were suckers and bullheads, and 2% were northern pike and largemouth bass. Due to physical limitations, Hovey Lake will never be a highly productive fishery but improvements can be made.

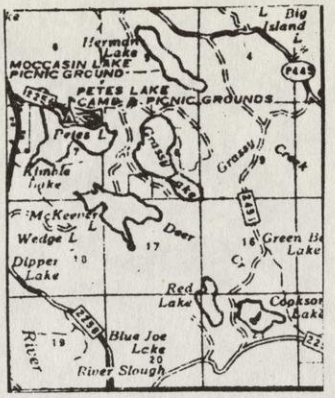
The management of Hovey Lake was discussed at a public meeting last summer. Based upon survey results and public input, we will be removing small pumpkinseeds and perch, suckers and bullheads late this spring using nets. We are expecting to remove a minimum of 10 pounds per acre. 12-18 inch northern pike will then be stocked by the DNR as they become available from other nearby waters.

Upper Big and Little Indian Rivers

1979 and 1980 surveys of these waters indicated fair to good brook trout fisheries in some areas and poor fisheries in other areas. Management of these waters was also discussed at a public meeting last June. Our objective is to provide a good self-sustaining fisheries (without stocking) in these waters. Key limiting factors to the present brook trout population are inadequate hiding cover for adult fish and inadequate spawning habitat. The DNR constructed four brook trout spawning riffles below the Lost Lake Road in 1979. These riffles are being used but more spawning habitat is needed further downstream.

This past summer YCC crews from the Muddy-Grimes Camp placed and refurbished over 100 log cover structures in the Upper Big Indian. Projects on both streams this summer include the placement of more log cover structures and placement of spawning gravels in spring seepage areas. A very limited amount of tag alder will also be removed in shallow areas to allow the current to increase and sweep away silt and debris and thus allow undercut banks to develop. This work is scheduled to begin in late June.





Pete's Lake (T44N, R18W) 190 acres

Pete's Lake was surveyed in 1979. Percent of total weight of test netting was:

Sucker	63%	Largemouth Bass	2%
Rockbass	20%	Yellow Perch	1%
Smallmouth Bass	11%	Pumpkinseed	0.8%
Northern Pike	2%	Bluegill	0.2%

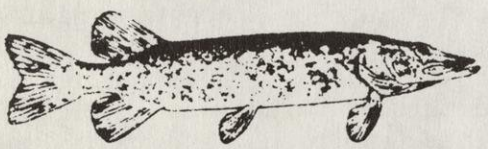
The average size of the northern pike was 17.9 inches while suckers were 17.6 inches. The problem with the predator-prey balance is obvious; an 18 inch pike would have a difficult time eating a 17 inch sucker. Another problem appears to be a lack of cover for bass.

A combination of management tools to improve the bass, pike, and panfish populations might include; manual removal of suckers and small rockbass, the construction of a rough fish barrier at the outlet to prevent re-entry of suckers, and the placement of shoreline and deep water cover structures.

The recreation use on Pete's Lake is high and, therefore, more management effort is required to maintain it. We are also considering the construction of two fishing piers to provide fishing opportunities especially for small children and senior citizens. One of these fishing piers will be designed for use by the handicapped.

Grassy Lake (T44N, R19W) 176 acres

The 1979 survey of Grassy Lake pointed out the predator-prey imbalance typical of many area lakes. 72% of total weight of fish netted were large suckers and bullheads. Small rockbass and perch made up 8% of test netting, and 14% bluegills. Species taken in lesser numbers were largemouth and smallmouth bass, pumpkinseeds, and northern pike. (Action to be taken-see McKeever Lake)



McKeever Lake (T44N, R18W) 132 acres

1979 survey results of McKeever were as follows. Percent of test netting results by weight was:

Sucker	42%	Largemouth Bass	2%
Bullhead	32%	Northern Pike	2%
Bluegill	11%	Pumpkinseeds	1%
Rockbass	5%	Yellow Perch	1%
Smallmouth Bass	4%		

Both Grassy and McKeever are very attractive lakes and have the potential for substantial improvements of the fisheries. The problem again is an abundance of suckers and bullheads and lack of adequate predator species.

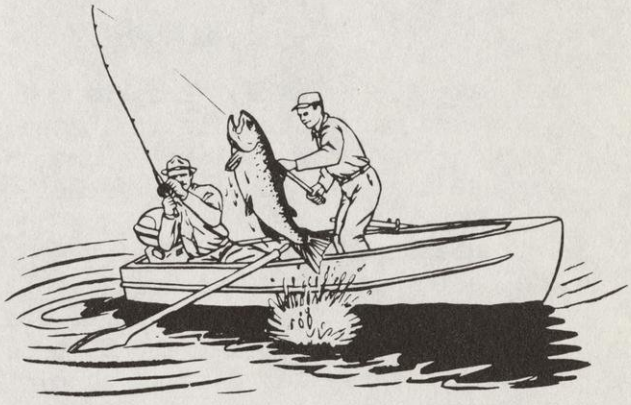
The introduction of native muskellunge, a large predator species closely related to northern pike, would provide an additional predator as well as a challenging and exciting fish to catch. A secondary advantage of managing these two lakes for muskellunge is that they would serve as a source of spawn relatively close to the Thompson Hatchery. This will enable the DNR to rear this

species at Thompson and introduce it and/or tiger muskies (a northern pike-muskie hybrid) into other waters in the central Upper Peninsula as the need for a large predator occurs.

When the predator base of a lake is re-established, the problem of maintaining it must be considered. Our objective is to maintain a stable balanced fishery, therefore, steps must be taken to prevent the collapse that has occurred in many lakes due to over-harvest. The best alternative appears to be increasing size limits.

Proposed size limits of 36 or 40 inches for muskies and pike and an 18 inch size limit on bass should provide an adequate predator base to maintain attractive fisheries and improve the quality of the panfish. Since serious depletion of the muskie population often results from winter spearing and tip-up fisheries, it would also be advisable to prohibit these activities on both Grassy and McKeever.

A manual removal of suckers and bullheads, to reduce their numbers, should also be carried out on Grassy and McKeever. These will be replaced by muskies, pike, and bass as balance is returned to the system.



Herman Lake (T44N, R18W) 81 acres

This lake was surveyed in 1975. Several questions remained so it was surveyed again in 1979. Reports from anglers indicate that Herman has had one of the best northern pike fisheries in the area in recent years. Test netting results substantiated these anglers claims. Poor access into the lake resulting in low angling pressure is probably the reason the pike fishery did not collapse to the level of other more accessable area lakes. Large suckers and bullheads make up 51% of fish taken in the survey. Other species present include perch, rockbass, pumpkinseeds, bluegills, and largemouth bass.

The best management scheme for Herman Lake appears to be to manage for the species present. A manual removal of suckers and bullheads should substantially improve the gamefish populations. Another possibility would be to raise the water level of Herman Lake by encouraging beaver activity at the outlet or constructing a water control structure. For now managing for beaver seems most feasible since it is most economical.

Halfmoon, Lion, Council, Red Jack Lake Chain (T44N, T45N, R19W)

Again 1978 survey results indicated that suckers and bullheads were the most abundant species in these lakes. The northern pike fishery is poor and panfish were present in fair numbers and sizes. A few black crappies were taken in Lion and Council and may be present in limited numbers in Halfmoon also.

Best management scheme for these lakes appears to be to manage for species present. Also to manually remove rough fish and improve the habitat by placing cover (fish shelters) in shallow water.

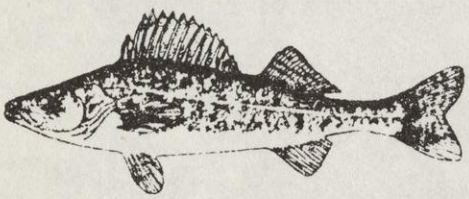
These lakes form the headwaters of Rock Creek which flows into the Indian River. The construction of a rough fish barrier on Rock Creek at the outlet of Council Lake would prevent the migration of suckers into these lakes.

Cookson Lake (T44N, R18W) 50 acres

76% of total weight of fish sampled in Cookson were large suckers and bullheads, 12% were bluegills, pumpkinseeds and rockbass, 10% northern pike and 2% largemouth bass. Like other lakes, the fishery of Cookson Lake would benefit if numbers of suckers and bullheads were decreased by netting. There is a possibility of installing a rough fish barrier at the outlet of Cookson to prevent the re-infestation of suckers from the Indian River.

McComb Lake (T44N, R19W) 50 acres

1980 survey indicates that the fishery of McComb Lake is in good shape. Black crappies (average size 10 inches) dominate the fishery and the size distribution of most species seems to be good. It is interesting to note that no bullheads were taken during the survey.



The possibility of improving spawning habitat by the addition of cover structures does exist but does not appear to be critical.

After seeing so many marginal fisheries, it is a pleasure to report the results of McComb Lake.

Red Lake (T44N, R18W) 42 acres

1980 survey results indicated that 65% of the total weight of fish sampled consisted of large suckers and bullheads, 20% was panfish whose average size was about 4.5 inches, 15% was small northern pike and largemouth bass.

Because of the rough fish as well as stunted panfish problem in Red Lake, the best management technique appears to be a total chemical reclamation to remove all fish. This would be followed by restocking with trout (to provide an interm fishery), largemouth bass, tiger muskie, and bluegills. A satisfactory fishery for panfish should return in two years, and fishing for bass and muskie within three or four years following reclamation.

We need your comments. Please stop in the office, call, or send us a letter or contact the DNR at Escanaba or Newberry.

Mike Dombeck

Mike Dombeck
District Fisheries Biologist

HIAWATHA
National Forest

Jim Bruce

Jim Bruce
District Ranger

Contact: Mike Dombeck (715) 762-2461 October 19, 1982

Immediate Release

Park Falls, WI -- Muskie Spawning Habitat Studied

Natural reproduction of muskies has declined during the past few decades. The objective of a cooperative project between the USDA Forest Service and the Wisconsin DNR is to find out why and furthermore, what can be done about it.

"Muskies do not construct nests or care for young like many other species of fish, therefore the success of muskie natural reproduction can be very dependent upon the quality of the spawning habitat." said Mike Dombeck, Forest Service Fisheries Biologist. Further compounding the problem, he said, Muskies often spawn in areas of muck and dense vegetation which are subject to oxygen depletion. Preliminary findings indicate that changes have occurred in spawning areas of some lake resulting in reduced survival of eggs. "We are currently exploring methods of increasing survival of eggs and young muskies in natural spawning areas." Dombeck added.

The current cost of rearing muskies to fingerling size for stocking is about $4.00 each. Any increase in natural reproduction of muskies could result in substantial economic savings. Techniques for improvement of spawning habitat of other species such as walleye, salmon and trout, has been successful, however according to Dombeck, this is the first attempt to improve muskie spawning habitat.

--more--

Management of fish populations, such as size and bag limits and sitting seasons is a state responsibility. The Forest Service is responsible for habitat management on Forest Service Lands. Many muskie lakes in the upper midwest are within National Forest Boundaries. Hopefully this joint effort of the Forest Fervice and Wisconsin DNR will result in improved natural production of Wisconsin's official state fish.

--end--

For further information contact:

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Park Falls, WI 54552

(715)762-2461

Or

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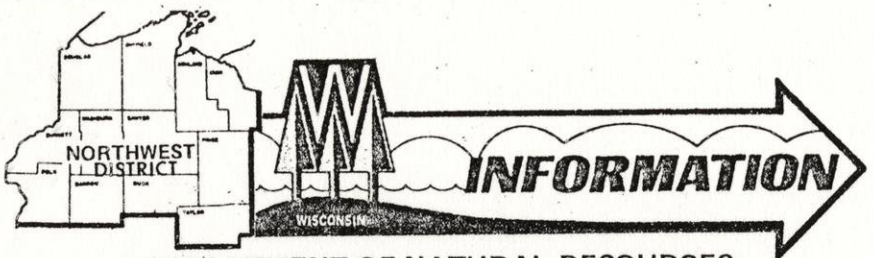
(414)291-1749



DEPARTMENT OF NATURAL RESOURCES
NORTHWEST DISTRICT HEADQUARTERS
BOX 309, SPOONER, WISCONSIN 54801
PHONE (715) 635-2101

SPOONER, WI--Four lakes in northern Wisconsin have been chosen for a unique musky research study. The project involves planting eggs and fry and studying its survival on different lake bottom types. Information gained from the project may eventually increase musky populations without increasing management costs.

Currently muskies are present in 751 waters in the state; however, because of problems with natural reproduction, fish populations must be maintained through stocking.

"Muskies spawn on bottom material that greatly decreases egg and fry survival," said David Hanson, Warmwater Research Biologist, Spooner, "our research will help identify the influence of different bottom materials on survival."

Every spring for the next four years, eggs and fry will be planted in Bass Lake and Patterson Lake in Washburn County; Cisco Lake, Bayfield County and Bass Lake, Oneida County. The lakes were chosen because they currently contain no muskellunge, have a diversity of bottom materials and are landlocked to prevent fingerling loss.

Although the lakes will support muskies, Hanson said that after the study is completed no additional muskie management will take place.

"Without a periodic stocking program in those lakes, muskies will cease to exist," he said. Hanson added that even though some of the fish will grow to large size, they will have little or no detrimental affect on the lakes current fishery.

##########

For more information contact:

David A. Hanson
Warmwater Research Biologist
Northwest District Headquarters
or
Jim Bishop
Public Information Officer
Northwest District Headquarters

4/29/83

By WO,OI

FOREST SERVICE
DAILY NEWS DIGEST
November 6, 1984

GRASSHOPPERS INFEST SOUTH DAKOTA -- A 1984 cooperative study by the South Dakota Dept. of Agriculture and the USDA states that over 2 million acres of state rangeland are infested with grasshoppers, says the Nation's Center News (Buffalo, SD). Because there was no money to initiate a spraying program when it would have done the most good the infestation will probably worsen by the next growing season says a state agriculture department spokesman. Eight grasshoppers per square yard determine an infestation which in turn causes economic damage to rangeland.

SUPERVISOR DEFENDS TIMBER SALES -- Forest management involves more than timber sales, said Dave Moran, Fishlake National Forest Supervisor in an interview with the Deseret News (Utah). Moran was responding to criticisms that timber sales lose money. Moran said the Multiple-use Sustained-Yield Act and the NFMA direct management for many benefits, not just timber production. 'Maximizing cash profit is not the legally prescribed objective of national forest management,' he said. 'Some sales are designed to improve quality of remaining timber, and salvage and prevent waste of trees damaged by fires, insects or diseases.'

REVISED BILL COULD MEAN MORE WILDERNESS -- Rep. Ron Marlenee (R-Mont.) says there will be some changes in boundaries in a revised wilderness bill the Montana congressional delegation will propose next year, reports the Great Falls Montana Standard. Marlenee was the only member of the state's congressional delegation to speak at a day long wilderness forum attended by a number of special interest groups. Roberta Anderson of Amoco Production Co. called oil and gas development on public lands a 'soap opera with government planners playing the leading role.' She said Congress should repeal the NEPA to 'return logic to the planning process,' which she said now allows for 'delay at any cost.'

IT'S A 'GRIZZLY' SITUATION -- WO, Wildlife and Fisheries Staff reports receiving numerous letters the last few days in what seems to be a public outcry over the plight of the threatened grizzly bear. Citizens' solutions for solving the poaching problem range from 'stiff' fines to hanging. The letters also expressed concerns over the use of tranquilizers for study of the bears, as well as over grazing, logging, and other activities in bear country.

FS ENTERS EGG SANDWICH BUSINESS -- Biologists on the Chequamegon and Ottawa NF's (Wis.) will use 'sandwich-like' devices to stock muskie eggs directly into forest lakes, says UPI. About 2,000 eggs will be put on each sandwich, several of which will be put in mesh cages on the lake bottoms. The eggs are spread on the face of a piece of artificial grass, then a second piece of the material is placed over them and they are all held together in a frame. Fisheries biologist Michael Dombeck says the cages and the sandwiches will prevent the eggs from being eaten by predator fish. They will also protect them from water turbulence and keep the eggs from dying for lack of oxygen on the lake bottom. Dombeck has been researching the decline of successful muskie reproduction in many lakes that formerly sustained healthy populations of the fish.

wfhr•newsletter

HABITAT FUTURES

United States Department of Agriculture Forest Service
Wildlife and Fish Ecology Unit 3825 E. Mulberry, Fort Collins, CO 80524 Summer 1985

THE EDITOR'S COLUMN

By Robert D. Nelson
Director, Wildlife and Fisheries

WFHR: Technology at the Crossroads

Crossroads always present new opportunities. There's often a little uncertainty because you're not sure exactly what will happen when you take a new route. But there's always pride in having arrived at a point where a new course is possible. I want to share a few thoughts on where we've been, where we're going, and the important roles for technology in our future.

To date our Wildlife and Fish Habitat Relationships Program has yielded good payoffs. Integration of wildlife and fish in Forest plans, improved ability to quantify wildlife and fish resources, and better methods for addressing diversity, viable populations, and featured species production are but a few of the benefits. Creative efforts by research and management biologists throughout the Forest Service are the reasons.

New technologies are always needed to keep pace with change, but to get the focus closer to the field the Regional Offices will lead the way. Every Region and Station has shown the solid commitment to technical excellence that makes this shift from National to Regional leadership possible.

At this time not all decisions have been made about how the National Wildlife and Fish Ecology Unit will be restructured and located to better serve the field. But it will continue to play a role in our decentralized approach to technology development and transfer. For example, ongoing FHR developments will continue with National coordination for at least another year. And we'll maintain a National role in such multi-regional issues as viable populations planning technologies and our part in National efforts on implementing Forest plans.

Full application of WFHR tools is now our biggest challenge. We still need to see wider and more routine uses on all Forests and Districts in order to claim full success for the Program. So it's time to add a route for technology transfer and implementation on the ground.

We don't plan to chart this new course alone. Our focus will be on integrated technologies that are used by Forest and District interdisciplinary teams to improve judgments about all resources and values. So we'll concentrate at all levels on methods and models that serve more than just a few resources. If we're not in the lead on these technologies, we'll at least be on the team.

Our goal is to use technologies more effectively to improve our abilities as managers. We believe that technology can be a powerful force for leadership. Having a better set of information, methods, models, and other tools lets wildlife and fish biologists take the lead and be proactive.

Gone are the days when biologists have to wait for someone else to propose actions to which they can react. We're using our new technologies to help us be full partners in Forest Service conservation leadership. The integrated resource management efforts that Regions are undertaking to implement Forest plans are good examples of how to make full use of new tools.

Besides putting us in a leadership role, technology can help streamline our jobs. That works in 3 ways. First, being proactive rather than reactive increases our opportunities to meet wildlife and fish goals through multiple-resource projects. Second, reducing the amount of time spent on analyzing things (because we now have efficient methods for using existing information) leaves more time for positive actions. And third, quantifying the wildlife and fish benefits, values, risks, and costs, due to proposed actions should help show how decisions balance opportunities and tradeoffs. Perhaps more of these decisions will be accepted with fewer rounds of analysis.

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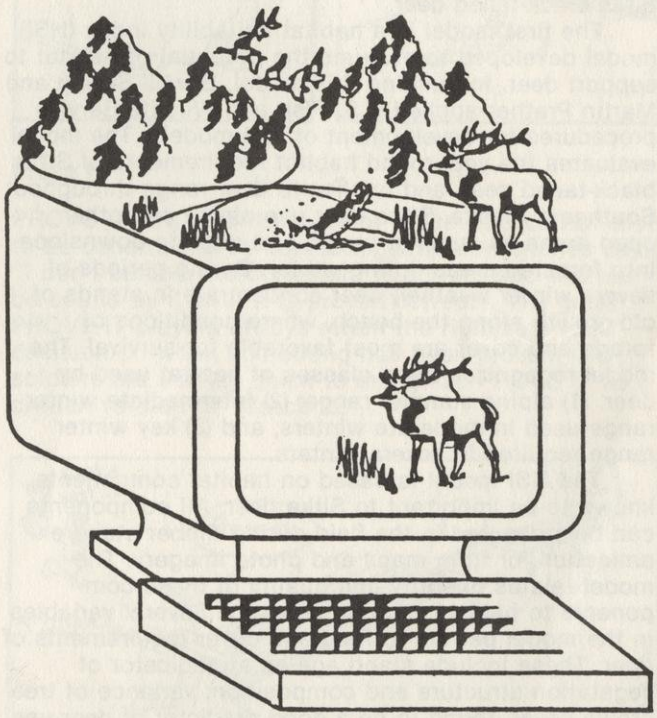
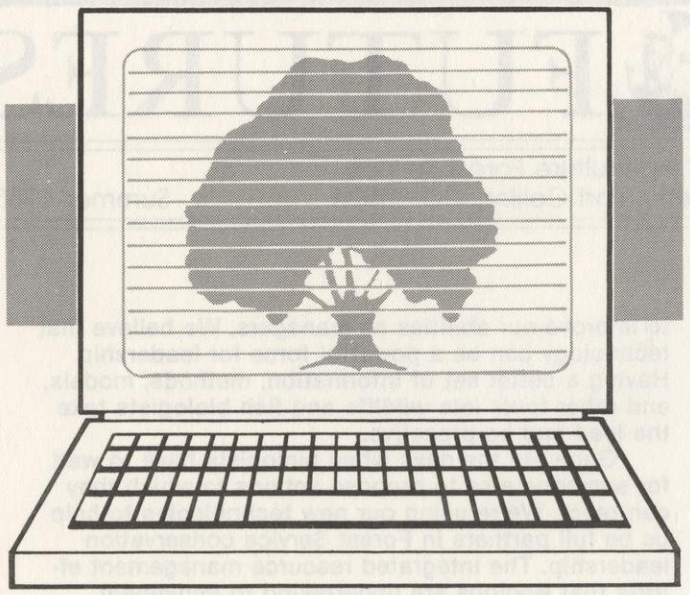




SHADE TREE MODELER

DEER MODELS FOR PLANNING AND MANAGING HABITATS IN THE ALASKA REGION

The Tongass National Forest in Alaska manages 2 million hectares of commercial forest that is home to the Sitka black-tailed deer, the major big game species in Southeast Alaska. Conversion of old-growth stands of Sitka spruce, western hemlock, and western redcedar to even-aged second growth, and subsequent effects on deer, is a major management issue in Southeast Alaska. Recently, biologists on the Tongass National Forest have developed two types of models to improve habitat planning and management for the Sitka black-tailed deer.

The first model is a habitat suitability index (HSI) model developed to evaluate the potential of habitat to support deer. In building this model, Lowell Suring and Martin Prather applied U.S. Fish and Wildlife Service procedures for development of HSI models. The model evaluates the year-round habitat requirements of Sitka black-tailed deer, and applies to deer range throughout Southeast Alaska. Sitka deer use alpine and other open areas as summer range, and migrate downslope into forested areas during winter. During periods of severe winter weather, deer concentrate in stands of old-growth along the beach, where conditions of forage and cover are most favorable for survival. The model recognizes three classes of habitat used by deer: (1) alpine summer range; (2) intermediate winter range used in moderate winters; and (3) key winter range required in severe winters.

The HSI model is based on habitat components known to be important to Sitka deer. All components can be measured in the field during timber stand examination, or from maps and photo imagery. The model relates quantity and quality of these components to habitat carrying capacity. Several variables in the model pertain to food and cover requirements of deer. These include stand age as an indicator of vegetation structure and composition; variance of tree crown cover, found to be a good predictor of deer use of stands in winter; slash accumulation on cutover areas; size of openings; and distance from foraging areas to forested cover. Two other variables, slope orientation and proximity to saltwater, represent physical conditions known to influence deer habitat use. Remaining variables represent the effects of distance between summer and winter range, and proportions of different habitats available within the analysis area.

Managers may use the model to evaluate habitat conditions at a point in time for an analysis area consisting of numerous forest stands. They may also use the model to predict how suitability of individual stands will change over time through natural processes and management activities.

In developing the HSI model, Lowell and Martin used an Apple IIe and the Microsoft "Multiplan Spreadsheet" software. The Region plans to adapt the model to the "Compucalc" spreadsheet on the Data General system so that it will be widely available to users.

The second deer model, developed by Martin Prather and Gene DeGayner, estimates amounts of winter habitat required to sustain deer populations at levels that meet public demand. Part one of the model establishes a deer population goal based on local hunter demand. This analysis utilizes demographics of the local human population (present population level, population growth rate, percent of the population that hunts), plus a desired hunter success rate set by State wildlife managers.

Part two of the model consists of evaluations that portray the ability of the habitat to produce deer to meet human demand. Intrinsic growth rate of the deer population, ratio of deer to wolves in the area, and average number of deer killed per wolf per year are used to estimate proportion of the annual growth increment available for harvest. Carrying capacity of key and intermediate deer winter range is estimated from pellet density information collected by the Alaska Department of Fish and Game. Carrying capacity, proportion of the annual growth increment available for harvest, and amounts of deer winter range within the area are evaluated to determine whether demand and population goals, identified in part one of the model, may be met in a given year.

In severe winters, only key winter range has survival value for deer. In such years, intermediate deer winter range is excluded from the analysis. The model also includes a resilience factor that may be applied in the analysis to predict how quickly the deer population will rebound following a severe winter.

Managers may use the model to determine the amounts of key deer winter range that must be maintained to meet public demands for deer over time. The deer demand model was developed to serve habitat planning needs on the Ketchikan Area of the Tongass National Forest. The human population, for the most part, consists of the town of Ketchikan and a few coastal villages. Only consumptive use is considered in this evaluation of public demand for deer. Summer range is excluded from the model because it is not believed to limit deer populations in the Ketchikan Area. The approach for identifying population goals has wide-spread application, but specific components and relationships within the model would need to be modified when the tool is applied to management situations that differ from the Ketchikan Area.

Gene and Martin programmed the deer demand model in Basic for use on an IBM-PC. They plan to

make the model available for users on the Apple IIe and Data General.

For more information on the Alaska Region's modeling efforts contact the WFHR Coordinator, Wini Sidle, at the Regional Office in Juneau (907-586-8752).

MICRO COMPUTER WORKSHOP

A National Workshop on Micro-Computer Applications in Fish and Wildlife Programs—A State of the Art Review will be held 9-11 October 1985 at Colorado State University, Fort Collins, Colorado.

Designed as a follow-up to the first national workshop held in Blacksburg, Virginia (December 1983) the workshop will provide an opportunity for exchange of ideas and demonstrations of micro-computer based programs. The goal of the workshop is to enhance the transfer of micro-computer technology used in fish and wildlife management.

The workshop will feature results from a questionnaire survey of micro-computer applications mailed this past spring to approximately 1000 offices of State/Federal governments, universities, professional societies, private groups, and individuals. Response to the survey will be divided into statistical analysis, field data manipulation, data base management programs, geographic information systems, telemetry applications, population models, and telecommunication including word processing, electronic mail, bulletin boards, etc.

Emphasis will be placed on application, and many of the programs will be on display. Participants will receive a compilation of the micro-computer application survey results, a copy of summary papers, recommendations, and a list of participants including vendors. Anyone needing additional information contact: Don Schrupp, Habitat Resources Section, Colorado Division of Wildlife, 6060 Broadway, Denver, CO 80216. (303)297-1192, Ext. 275.

Technology at the Crossroads

Continued from page 1

Getting new technologies into practice doesn't just happen because they're there. It requires a special effort. Our focus for improving technology transfer and implementation will be Continuing Education for biologists and other managers responsible for wildlife and fish habitat management. Several training modules and short courses are already under development. The goal is to have all the new habitat planning and evaluation concepts, methods, and models in publications, slide-tapes, videos, displays, or demonstrations by the end of 1987. And in keeping with the decentralized approach, Regions and Stations are leading the way here too.

I cannot recall a more interesting or challenging time to be in the Forest Service. Forest plans show our customers for the first time the full range of things we are doing. On balance, wildlife and fish and those who enjoy them are well served. But we're not without some controversies. We'll champion the winners and work through the tough spots because never before have the opportunities been better to bring wildlife and fish into a full partnership role in multiple-use resource management.

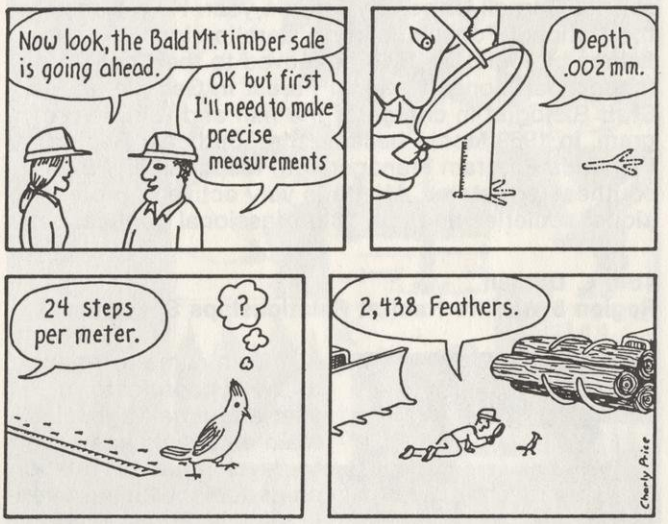
Innovation, action, excellence, and getting it done on-the-ground are the passwords. To paraphrase Yogi Berra, it ain't happened 'til its happened on the ground!

TOWARD THE MANAGED FOREST— GOIN' WHERE WE AIN'T NEVER BEEN

Many of you have probably read Jack Ward Thomas' recent paper by this title. If you haven't its in the April 1985 issue of Forestry Chronicle. In keeping with the spirit of taking our jobs seriously, but not ourselves we bring you 2 more of Charly Price's illustrations of the games foresters and biologists play on one another.

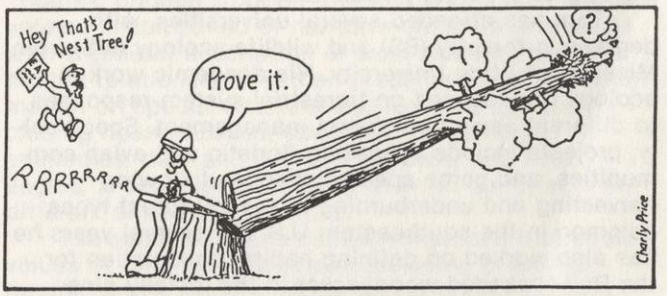
Precision

PRECISION is a game often played by novice managers to mask the appearance of ignorance by insisting on high levels of precision for what can only be nebulous estimates. The game is often accompanied by steadfast opposition to using, in the absence of better data, principles and general relationships that have proven useful elsewhere. One expert critic has observed that a good PRECISION player can stand quietly in the midst of a dozen D-8 Cats busily rearranging the world and take measurements in milli-microns.



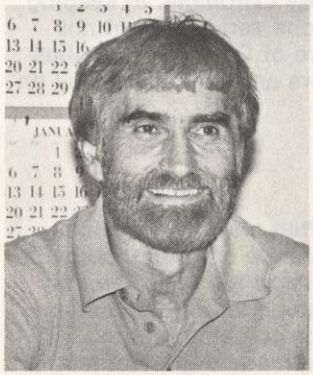
Prove It

PROVE IT is a favorite game of those who do not wish to be constrained by something. The constrainee says "I don't believe the constraint is correct and will not be bound by it until it is proven correct". The great PROVE IT players always retain the right to a final decision on when something has been proven. Old soldiers are usually quick to recognize PROVE IT as a civilian version of "Catch 22".



WHFR SKUNKWORKS

Monte Seehorn
Region 8 Fisheries Program Manager



Monte Seehorn graduated from North Carolina State University in 1955 with a B.S. degree in Wildlife Conservation and Management. After two years in the Army as an infantry officer he was discharged from active duty. He was immediately hired by the Forest Service and has the distinction of being the first field biologist hired in the Southeast. From 1958-1964 Monte worked on the National Forests in North Carolina as a forester and then as the field project leader handling fish and wildlife duties. In 1964 Monte was selected by the Forest Service to receive specialized training in fisheries management and was sent to Cornell University for one year. He returned to the National Forests in North Carolina in 1965 as the fishery biologist. In 1966 he moved to the Chattahoochee/Oconee National Forest in Georgia as the Staff Biologist in charge of the fish and wildlife program. In 1969 Monte became the Southeast Region Fisheries Program Manager with responsibility in 14 southeastern states. Monte is very active in professional societies and has 13 professional publications.

Tom L. Darden
Region 8 Wildlife Habitat Relationships Specialist

Tom came to Atlanta as WHR coordinator a year and a half ago. His main emphasis has been to develop habitat relationships tools, which primarily support Forest Planning. He is now concentrating on getting these tools and concepts in the hands of managers to be used in Plan implementation and monitoring.

Tom has worked with the Forest Service in several assignments including Forest Planning Biologist, Resources Assistant Ranger on two National Forets, multi-district zone Wildlife Biologist and Forester after starting as a Forestry Technician.

Tom has attended several universities, with degrees in forestry (BS) and wildlife ecology (MS) from Mississippi State University. His academic work in ecology has focused on terrestrial system responses to different aspects of forest management. Specifically, projects include assessing floristic and avian communities, and game species changes following harvesting and underburning in several forest types common in the southeastern U.S. For several years he has also worked on defining habitat association for the Red-cockaded woodpecker in the loblolly pine forest type, in special remote sensing projects, development of habitat evaluations procedures, and as a consulting programmer for forest industry.

Personal interests currently include sailing, traveling and fishing with his wife and two sons, swimming, and playing music (drums) in rhythm and blues and rock and roll groups.

Holthausen Moves to Portland:

After 2½ years in the Ft. Collins Wildlife and Fish Ecology Unit, Richard Holthausen is moving to Portland to become the WHR Coordinator for Region 6. It's an exciting time for Holt to join the Portland team, coinciding with the recent publication of the west-side habitat books (see "Two Regions Come Online with Wildlife and Fish Habitat Relationships Books") and the ongoing viability analysis for the Spotted Owl. The future of Holt's position in Ft. Collins is uncertain, but much of his developmental work has been taken over by Nancy Dobbs (see below).

We wish Holt the best in Portland, and hope he's successful in continuing the development of R6's WHR program.

Nancy Dobbs Joins Ft. Collins Staff:

Nancy Dobbs joined the Wildlife and Fish Ecology Unit in January. Her major tasks are software development and documentation. Nancy's position is shared with the Arapaho and Roosevelt National Forests where she previously developed programs for management applications of Region 2 habitat information.

Nancy holds a B.S. in wildlife science from Texas Tech, and did coursework in computer science at Colorado State. Her previous experience includes work in range, wildlife, and systems analysis for the Pawnee National Grassland and Arapaho-Roosevelt Forests. We welcome Nancy to the Ft. Collins staff, and hope that she has the opportunity to work with many of the Regional biologists.

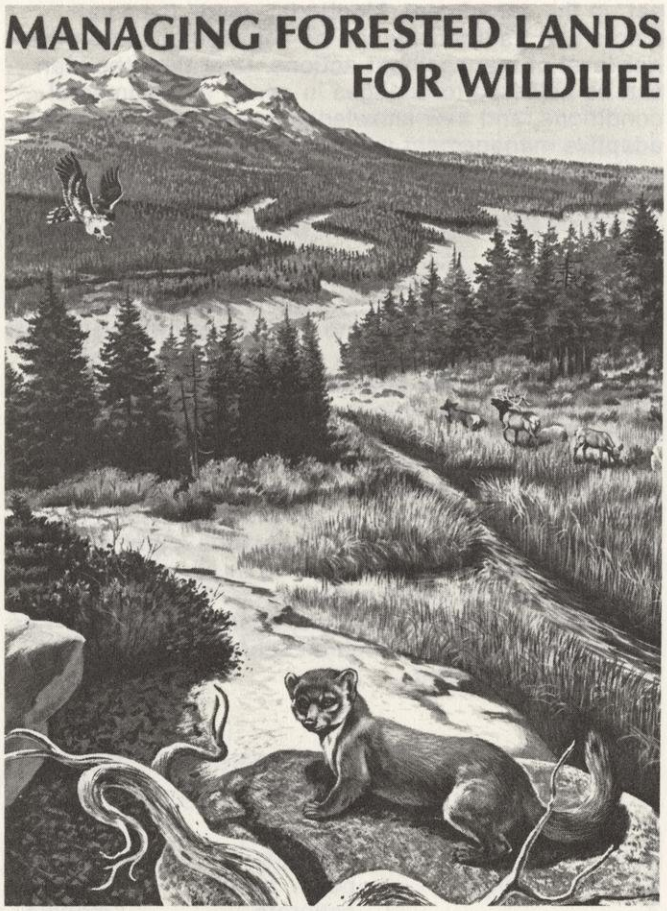
Salwasser Moves to DC:

The string has run out! After 6 years of Regional and Washington Office assignments that involved field duty stations Hal Salwasser is going to work in the real WO. He will become the Deputy Director for Wildlife and Fisheries, replacing Bob Nelson who recently moved up to the Director's job. Hal is looking forward to a hard-charging wildlife and fisheries program in the Forest Service; one that uses habitat relationships technologies in a big way. We anticipate being able to introduce the new Unit Leader to you in the next Habitat Futures.

TWO REGIONS COME ON-LINE WITH WILDLIFE AND FISH HABITAT RELATIONSHIPS BOOKS

In the past six months, Region 2 and 6 have released significant new publications on wildlife and fish habitats. These books are rich sources of information, and will serve as important components of the two Regions' WFHR Programs.

Region 2's book was developed cooperatively by the Regional Range, Wildlife, Fisheries and Ecology Staff and the Colorado Division of Wildlife. It contains chapters on principles of wildlife management,

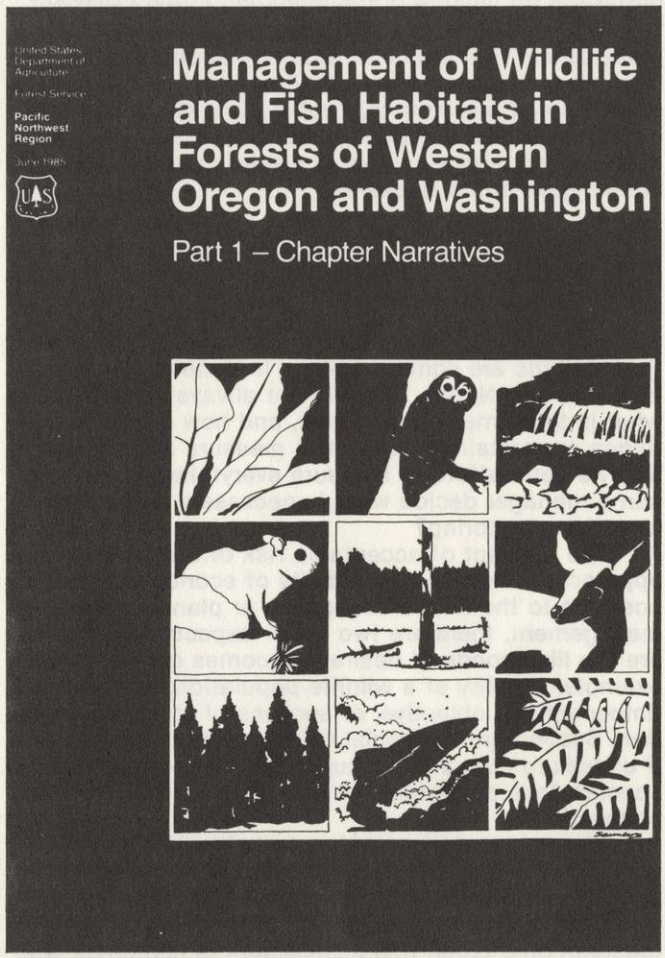


forested ecosystems of the Rocky Mountains, habitat requirements for selected species, silvicultural practices, creating habitat conditions, aquatic wildlife, establishing wildlife goals and objectives, and a case study application.

One section of the book already shows signs of heavy use; the chapter on species habitat requirements. This chapter rates the value of forested habitat types in supplying food and cover for 60 vertebrate species. The habitat types are classified by cover type and structural stage, and the rating system contains 4 categories; no use, marginal, good, and excellent. The chapter also contains information on the density of each species under optimum conditions, and the relative cover and feeding requirements of the species.

The habitat relationships values in the book form the basis for simple habitat capability models for each species, and the Region has made those models available to the Forests in the form of a simple computer program. This program, combined with the resource coordination process presented in the book, gives Regional biologists a powerful tool for accomplishing wildlife and fish objectives. Regional Forester Jim Torrence is excited about putting the information into use and said; "I am extremely pleased with the book and I want to see it put to use on the ground. The information and process allows us to progressively manage habitats. The book also provides a means to meet multiple use goals and direction in forest plans. Forest plan goals plus standards and guidelines require us to be quantitative and to prescribe and evaluate vegetation management over time on large areas. The book provides a practical way for field personnel to accomplish these requirements."

Proof of the book's success is its acceptance by Forest and District biologists as a valuable tool. Information from the book is being used in planning timber sales all across the Region, and the value of quantitative habitat information is being widely acknowledged. Credit for rapid acceptance of the book goes both to Regional Forester Torrence and to Melanie Malespin, the Regional WHR Coordinator.



Region 6's new book was published in cooperation with the Bureau of Land Management, with additional funding provided by the Oregon Department of Fish and Wildlife and the Washington Department of Game. Reade Brown edited the book and directed its several dozen contributors.

The new west-side habitat book was published in two volumes, and the format borrows heavily from Thomas' original work on the Blue Mountains. The first volume is composed of narrative chapters and starts with a general description of west-side habitats and habitat relationships. It then presents additional information on special habitats and featured species including riparian zones, estuaries, snags, logs, salmonids, deer and elk, spotted owls, and bald eagles. It concludes with a section on the effects of different silvicultural options.

The second volume contains matrices that show values of different habitats in providing breeding, resting, and feeding sites for all vertebrate species.

The rated habitats include different stand conditions for each plant community along with special and unique habitats. The rating system is 3-level indicating primary, secondary and unsuitable habitat.

Hopes for future applications of the publication are probably best expressed by Jack Ward Thomas in his forward. "Managers now have the tools to do a better job of considering wildlife within the fabric of the managed forest—this handbook clearly demonstrates that. They have the skill. A large question remains. Do forest managers have the *will* to do a better job for wildlife in the managed forest? Without that will, this is likely to be just another book among many others that reside in pristine condition in neat rows on a thousand shelves. With such will it can be a powerful and effective tool; a catalyst; and a dog-eared, written-in, smudged, *used* companion to forest management professionals in western Oregon and Washington and elsewhere."

MONITORING WILDLIFE AND FISH: INVEST IN PROPORTION TO RISKS AND VALUES

Monitoring is getting a lot of attention now that Forest plans are coming on-line. It is clearly required by NEPA and NFMA. But it is not always clear just what is to be measured, where, and how often. Two things are certain: we've got to measure something, and we can't afford to measure everything. So how can a manager decide what is necessary and sufficient for monitoring?

The concept of acceptable risk offers a promising approach. Risk is the probability of economic or social cost due to the failure of a policy or plan. In resource management, there are two major aspects to risk. First are the likelihoods of desired outcomes occurring, for example, viability of a wildlife population, meeting a timber volume objective, or success of stand regeneration. Second are the social or economic consequences if undesired outcomes occur, for example loss of a species, loss of revenue, or new laws to rectify social concerns.

The first part of a risk analysis identifies the aspects of a plan which cause the highest uncertainty about the desired outcomes. These might be assumptions, standards, or assignment of lands to different prescriptions. When this assessment is combined with an analysis of outcomes that might have the highest social or economic consequences, understanding can be gained about what causes the greatest concerns in a plan or policy.

Two things can come out of such a risk analysis. The policy or plan might be adjusted to reduce the risk before implementation. Or the plan may be implemented, with the parts leading to high risk slated for higher monitoring investments. The first option is a conservative strategy, with managers hoping that new information will allow less cautious decisions in the future. The second option acknowledges that risks are present, and the managers hope that monitoring will "bail them out" before undesired outcomes occur. Both strategies may have high economic or social costs.

Risk analysis combined with adaptive management seems to be a reasonable compromise to being stuck in an analytical whirlpool or proceding without any checks and balances. In adaptive management a plan is like a working hypothesis. Management actions set up the experiment. Monitoring reads the treatments and its intensity can be adjusted based on the risk-level of management actions. Over time the plan can be adjusted to changes in goals, environmental conditions, and new knowledge and technologies. But adaptive management will only work if monitoring, evaluation, and revision complete the cycle. So, how can we bring monitoring on-line in an affordable and feasible way? Here are some ideas for wildlife and fish.

Issues can be categorized into 4 risk classes: High likelihood of failing to meet a goal with High cost or foregone value if the goal is not met (HH); Low likelihood of failing to meet a goal with High cost or foregone value if the goal is not met (LH); High likelihood with Low cost or value (HL); and Low likelihood with Low cost or value (LL).

How might various species fall into these classes and what are the implications for monitoring? Threatened, endangered, or sensitive species in intensively managed forests and rangelands might be in the HH class, while the same species in parks, wilderness, or fully protected areas might be LH. Game species, depending on habitat affinities, might fall in the HH or LH categories. Many nongame species might fall in the HL or LL classes.

		LIKELIHOOD OF ERROR	
		High	**Low**
COST or VALUE	High	Measure habitats, pops., and calibrate models	Measure habitats calibrate models
	Low	Measure habitats, calibrate models	Measure habitats and use models

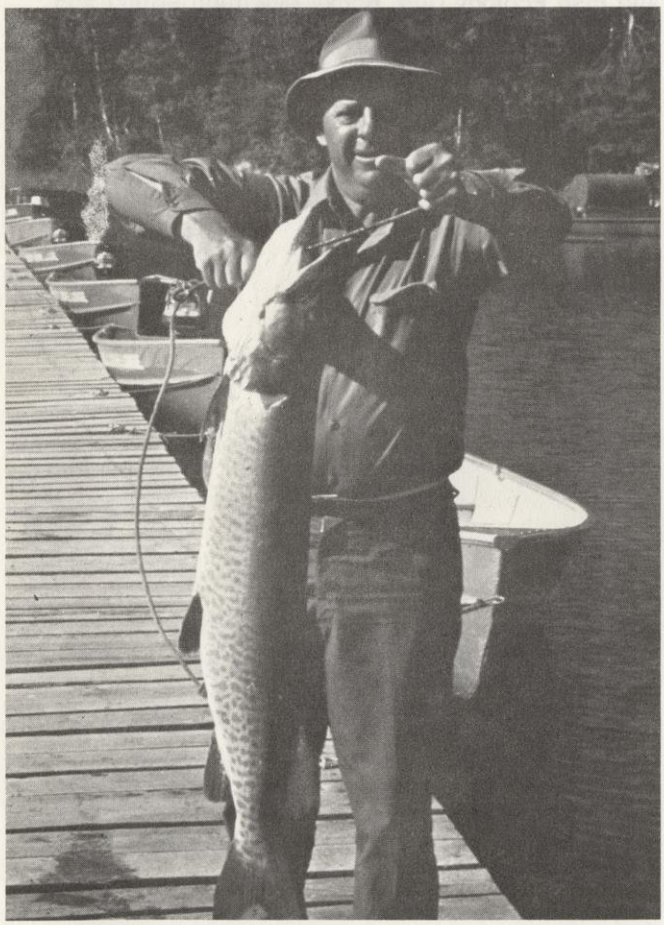
It costs far more to measure a species directly than to measure habitat conditions that can then be used to infer its population trends. If we know the relationships of a species to different habitats, such as from Habitat Capability Models, then periodic habitat inventories might suffice for monitoring LL and perhaps some LH and HL cases. For many LH and HL cases these habitat measurements could be augmented by State wildlife agency data, which are commonly available for many game species. Only for HH cases and perhaps some controversial LH and HL cases would the risk or value warrant an investment in frequent or intense population measurements.

Using a risk analysis approach to making decisions should allow fish and wildlife monitoring to dovetail with the continuing land, water, and vegetation inventories taken to support many other resource management needs. Only for moderate to high risk or value cases (HH, HL, and LH) would additional investments be needed to obtain some population data and calibrate species-habitat relationships models; that is do research to determine their reliability. Only for the most risky and valuable of these cases (HH) would high investments in direct population measurements be necessary.

Additional Readings:
Fischoff, B., et al. 1981. Acceptable risk. Cambridge Univ. Press. 185 p.
Holling, C.S. ed. 1978. Adaptive environmental assessment and management. John Wiley and Sons. 377 p.
Salwasser, H., et al. 1983. Monitoring wildlife and fish: mandates and their implications. Trans. N. Amer. Wildl. and Natur. Resour. Conf. 48:297-307.

MUSKY HABITAT RELATIONSHIPS IDENTIFIED

Region 9 has developed a procedure for evaluating muskellunge habitat using existing data. The musky is a featured fish species in Region 9 and a premier North American sportfish. It is estimated that the majority of the native musky waters occur within National Forest boundaries in the Great Lake states. In many areas where the species once maintained healthy natural populations, it has been extirpated or is sustained only through artificial propagation and stocking. Musky management strategies commonly include harvest regulations and the stocking of hatchery-reared fingerlings. Over the long-term, a more desirable approach to musky management might be to identify ecological factors contributing to the species decline, followed by corrective measures. The scarcity of musky habitat management programs is due to lack of knowledge rather than lack of interest. These considerations suggest that a descriptive analysis of musky lakes may provide valuable information concerning musky habitat relationships.



The project objectives were (1) to identify ecological factors which influence natural musky reproduction in midwestern lakes to provide a basis for development of habitat protection and enhancement measures and (2) to develop a quantitative procedure to evaluate muskellunge habitat in individual lakes. So how can such a biological problem be studied? One approach is an intensive case history analysis on a few lakes, but results can only be confirmed by doing a number of such case studies. Such studies are usually long-term, labor intensive, and expensive, and for these reasons often low priority, especially in economically austere times. However, as desirable as this approach is, it is important to realize that resource management does not stop and wait for answers, but is an on-going process, utilizing the best information available.

An alternative approach is to perform a statistical analysis on the data base which exists in agency files. There are disadvantages to this approach, since these data have been collected by different individuals at different times, in some cases using different methods. On the positive side, the data are readily available, require no additional field work, and are inexpensive to get. Today's computers can efficiently handle large data sets. In addition, such a data base covers a broad geographic range over time, and may point out trends that intensive studies miss because of local conditions. This effort utilized existing data from Forest Service and State resource agency files from Michigan, Minnesota, and Wisconsin.

Data on 94 ecological variables were compiled on 117 musky lakes. Each lake was placed into one of four discrete groups based upon level of natural musky reproduction: 1 (poor), 2 (low), 3 (moderate), and 4 (high or self-sustaining). This was based upon manager-estimates of the percentage of the population recruited from natural reproduction and was the dependent variable in the subsequent analyses.

Using this data base we utilized statistical procedures to obtain answers to a series of questions:

1. *What ecological factors are related to levels of musky reproduction?*
   Analysis of variance was used to identify those factors most useful as predictors of musky reproduction. The 0.1 level of significance was used since hazard in analyzing a data set compiled from several sources is not that false relationships will be identified, but that existing relationships will be masked due to large variances. Results of this procedure indicated that nine factors are related to musky reproduction, thus 85 of the 94 original ecological factors were eliminated.

2. *What is the direction of the relationship?*
   Correlation was used to answer this question. Negative relationships were identified with northern pike abundance, cultural development, seepage lakes, and conductivity while positive relationships were found for outlet volume, drainage lakes, alkalinity, rising spring water, and shoreline development factor (SDF).

3. *What combination of ecological factors best explains the variability in musky reproduction?*
   Stepwise linear regression analysis was used. Results showed that northern pike abundance alone accounted for 42 percent of the variability, while

northern pike and drainage lake together accounted for about 50 percent of the variability. All nine variables accounted for 57.4 percent of the variability with musky reproduction.

4. *Can these variables be used to predict musky reproduction potential in individual lakes?* The procedure used was discriminant function analysis. A discriminant model was developed which predicts the probability of a lake having a given level of musky reproduction based upon five ecological factors: northern pike abundance, drainage lake, rising spring water, alkalinity, and SDF.

Management Use of the Musky Model

Lake Name	% Probability of Self-Sustaining Reproduction				Management Actions
	1	2	3	4	
Chippewa	0	2	10	88	Monitor
Connors	70	18	10	3	Stock; Control Northern Pike
Madeline	6	16	49	22	Habitat Improvement

Now let us take a look at some practical applications. Lake Chippewa is the famous Wisconsin lake which has produced world record muskies. Based upon the discriminant model, there is an 88 percent probability that natural reproduction is high. Since this indicated that musky habitat is likely in good shape, all the manager may want to do is to monitor to make sure that what is good stays that way. For Connors Lake the model predicts a 70 percent probability of poor natural reproduction. Present management includes the stocking of hatchery-reared fingerling muskies. Other management options might include northern pike population control or water-level management. If there are limits to what can be done it is obvious that stocking is more critical to the maintenance of the musky fishery in Connors Lake than Lake Chippewa. Madeline Lake has a 49 percent probability of having moderate reproduction. Assuming the management objective of providing a self-sustaining fishery this indicates that spawning habitat improvement might be an option to move the musky fishery to the self-sustaining status. These examples illustrate how the model can assist the manager in setting priorities for stocking, northern pike population control, and habitat improvement projects.

The model has been extended to determine the economic value of a musky fishery and determining benefit/cost ratio of projects. The cost of maintaining a musky fishery soley through stocking fingerlings is $75/acre based upon cost of fingerlings and survival to catchable size. Based upon catch rates and population density data and the 1980 RPA value of $16.30/user day (WFUD) the value of a self-sustaining musky fishery is $87/acre. Since the percentage of high natural musky reproduction predicted by the model is equivalent to the percentage of the population recruited from natural reproduction, it is possible to calculate the value of the fishery based upon lake acreage. Additionally, by comparing the cost of projects and predicted results benefit/cost analyses can be made.

I do not propose this model as the sole basis for musky management, but rather as another tool to be used in combination with other decision variables.

Additionally, careful review of input data and model results can give the manager further insights into fishery resource problems and potential solutions.

This model is presently in use in Region 9 and is available on the Data General. Copies can be obtained by contacting Mike Dombeck, who recently moved to become Fisheries Program Manager in Region 5: (415) 556-8551.

WFHR INTRODUCTION SLIDE-TAPE AVAILABLE

A 20 minute slide-tape program on the Wildlife and Fish Habitat Relationships System is now available. Your Regional WFHR Coordinator has a copy for use within your Region. The program is designed for resource managers at all levels of the Forest Service. In addition it provides a good and entertaining overview for use at professional society meetings, training sessions, and discussions with university colleagues and interest groups.

The message includes a description of what WFHR is, what its components are, how its tools are used in resource management, and how to join the WFHR network. The program can be presented in either one projector or two projector disolve formats. Production was a joint venture between the Wildlife and Fish Ecology Unit, Rocky Mountain Forest and Range Experiment Station, and the Graphics Department at Colorado State University.