

New Jersey OUTDOORS

January/February 1974



State of New Jersey



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Fisheries Management
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Asst. Chief of the Bureau

New Jersey Outdoors Magazine

Steve Perrone
Editor

Harry Grosch
Photographer

Lucy Brennan
Circulation

Contributors

Bob Adams

Bob McDowell

Pete McLain

Teddy Schubert

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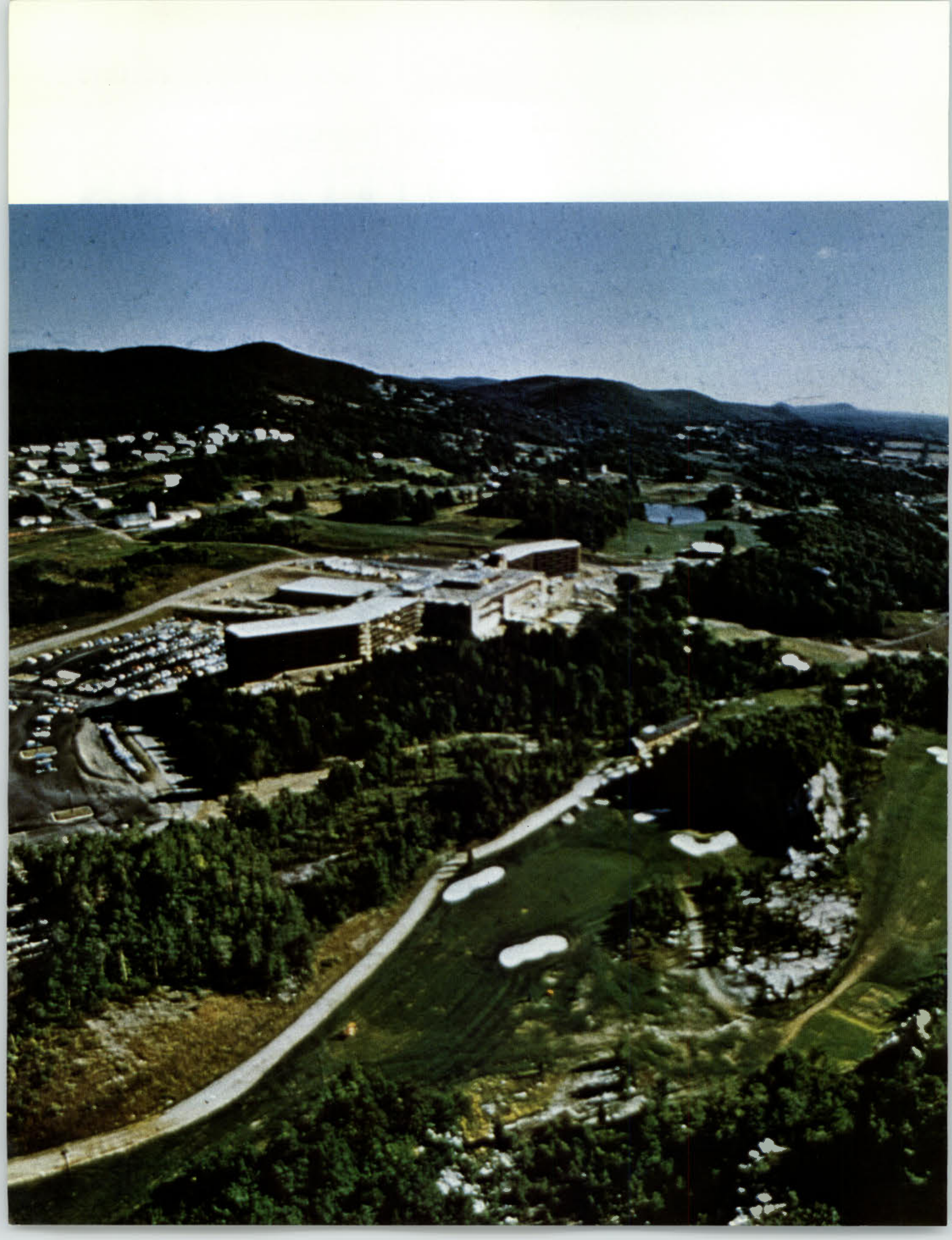
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NORTHEAST FISH AND WILDLIFE CONFERENCE COMES TO NEW JERSEY

For the first time in 15 years, New Jersey is the host state for the annual Northeast Fish and Wildlife Conference. The conference will be held at the Great Gorge Conference Center of Playboy Club Hotel at McAfee in the heart of New Jersey ski country during ski season, February 25-28, 1974. Conference Chairman is Robert McDowell of the New Jersey Division of Fish, Game and Shellfisheries.

Organizations participating in the conference are: The Northeastern Division, American Fisheries Society; Northeast Section, of The Wildlife Society; The Conservation Law Enforcement Chiefs Association; The Northeast Society of Conservation Engineers; The Northeast Conservation Information and Education Association; and The Association of Northeast Game, Fish and Conservation Commissioners.



Great Gorge ski areas—the world's largest snowmaking system, eight double chairlifts, a ski school, night skiing, and restaurants after you work up an appetite on the slopes.

Over 500 professionals, representing the various fields of wildlife conservation work will attend. These people work for federal, state, and private wildlife resource agencies in Maine, New Hampshire, Rhode Island, Vermont, Massachusetts, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Washington, D.C., Virginia, Maryland, and West Virginia and the Canadian provinces of New Brunswick, Quebec, New Foundland, Nova Scotia, Ontario and Prince Edward Island.

The conference, under the theme, "A New Era," will begin with addresses on the future of natural resource management with emphasis on the possible effects of the energy crisis on the wildlife resource. Speakers will be Mr. Nathaniel P. Reed, Assistant Secretary, Fish, Wildlife and Parks, U.S. Department of Interior; Mr. Richard H. Stroud, Executive Vice President of the Sport Fishing Institute; Dr. Shepard Bartnoff, Jersey Central Power and Light; and Congressman James Howard of New Jersey. Following the general program on the opening day of the conference the participating organizations will hold technical sessions to dispense the most up-to-date information

on fish and wildlife management and research.

New this year to the conference will be a non-technical panel entitled "A Common Ground—dialogue between conservation groups and management agencies." Representing the private conservation groups will be Dr. Roland C. Clement, Executive Vice President, National Audubon Society; Mr. Robert Hughes, National Wildlife Committee Chairman, The Sierra Club; Mr. Herbert Doig, Director, New York Fish and Game Division; and Mr. Earl Baysinger, Office of Endangered Species, Bureau of Sport Fisheries and Wildlife, U.S. Department of Interior. This program will be held on Tuesday, February 26 at 2 to 4 p.m. Anyone interested in wildlife should find this panel discussion interesting and lively.

The New Jersey Division of Fish, Game and Shellfisheries as the host agency for New Jersey is making every effort to insure the success of this conference. We feel the participants will find the conference constructive, timely, informative, and enjoyable. We know our fellow wildlife professionals will be impressed with Northwest New Jersey's rolling hills and forests. Anyone for skiing?



SCHEDULE FOR NORTHEAST CONFERENCE

MONDAY	Registration at 1:00 P.M. Cracker Barrel with Refreshments—7:30 Hosted by the Playboy Club Hotel Films and Presentation by Merrill Gerstner, President—Performance Communications, Inc.			LAW ENFORCEMENT		
				C.L.E.C.A. Business Meeting 2:00 P.M.—To Be Announced		
TUESDAY	GENERAL SESSION 9:15-11:45 A.M. Penthouse “A New Era—Possible Effects of the Energy Crisis on Fish and Wildlife Resources”					
	WILDLIFE	FISHERIES	ENGINEERS	LAW ENFORCEMENT	INFORMATION & EDUCATION	NON- PROFESSIONALS
	1:30-4:00 P.M. Papers in the Trenton Rooms A & B	1:15-3:30 P.M. Four concurrent sessions Marine, Fresh Water, Anadromous, and Aquatic Impact— Duke of York Rooms	1:15 P.M.-3:30 P.M. Papers in the Newton Room	1:45-4:30 P.M. Papers in Room to be announced	1:15-2:00 P.M. Presentation in Room to be announced 2:00 P.M. Joint Session 4:00 P.M. With Non- Professional Program 4:00-6:00 P.M. Business Meeting in Room to be announced	12:00-1:30 P.M. Lunch—Presentation By Playboy Bunny Mother 2:00-4:00 P.M. Panel Discussion 4:00-5:00 P.M. Cake & Coffee Reception by N. J. Chapter Wildlife Society 5:30 P.M. Womens Cocktail Hour— Mrs. Cookingham Hostess Rooms to be announced
	4:00-6:00 P.M. Business Meeting Trenton Rooms A & B	4:00-6:00 P.M. Business Meeting— Sussex Room	4:00-5:00 P.M. Business Meeting in Newton Room			
Student Program 7:30-9:00 P.M.—Panel Discussion						
WEDNESDAY	9:00 A.M.-5:05 P.M. Papers in the Trenton Rooms A & B	9:00 A.M.-5:00 P.M. Fresh water and Marine— Duke of York 9:00-2:45—Fish Culture 9:00-2:45 P.M. Anadromous—Duke of York Room 3:00-4:30 P.M. Joint Anadromous— Conservation Engineers Duke of York Room 3:00-5:00 P.M. Aquatic Impact	9:00 A.M.-4:30 P.M. Papers in the Sussex Room	9:00 A.M.-4:40 P.M. Papers in Room to be announced	9:00-11:00 A.M. Workshop 11:15-11:45 A.M. Presentation in Room to be announced 1:30-4:15 P.M. Presentations in Room to be announced	9:00 A.M.-12:00 Organized Ski 10:00-11:00 A.M. Playboy—Beauty Workshop 12:00-1:30 P.M. Luncheon Program on Game Cooking 2:00-3:30 P.M. Program on Backyard Wildlife (Locations to be announced)
	Hospitality Hour 6:00-7:00 P.M.—To Be Announced Banquet & Entertainment 7:30 P.M.—Duke of York Rooms					
THURSDAY	9:00 A.M.-12:00 Joint Program Fish, Wildlife and Engineers in Penthouse	9:00 A.M.-12:00 Joint Fish-Wildlife, Conservation Engineers Panel— “Environment Impact Statements” Penthouse	9:00 A.M.-12:00 Joint Fish, Wildlife, and Engineers Panel— “Environmental Impact Statements” Penthouse	9:00-10:00 A.M. Papers 10:15 A.M. C.L.E.C.A. Business Meeting in Room to be announced	9:00-11:15 A.M. Presentations in Rooms to be announced 10:00-11:00 A.M. Hair Styling Program (Locations to be announced)	

Non-Professional Programs at Northeast Conference

By Carol Applegate

Women today are facing many changes in society. There are many like myself who enjoy being mothers and homemakers but find that some break in routine is imperative just to retain sanity. Some women take up crafts or writing or social work. I have adopted my husband's profession and try to tag along to his professional meetings. These meetings are a real therapy for me. As a biologist myself and raised in the outdoors it wasn't difficult to become a para-wildlife biologist.

When I go to the wildlife meetings I have always been somewhat depressed by the so-called "ladies" program usually offered by the convention center. The luxuries of resort life are enjoyable to all and many women attend these meetings for no other reason. Others, I'm sure (or at least, I hope) would enjoy hearing some talks geared to things they can do in the wildlife area. I'm counting on this premise at the 1974 Fish and Wildlife Conference where I will be acting as Ladies Program Chairman. I've been given enough leeway to go in many different directions.

What would I like in a ladies program? Immediately my reaction was, why just ladies? Can't we have a program others (including, perhaps, the professionals) might attend? Must we exclude the males? With that idea in mind several extremely interesting "think sessions" are being blended into the enjoyable social structure of the Great Gorge Conference Center at McAfee, N.J.

The Tuesday, Feb. 26, session came about by accident. One friend commented that in general professional meetings offered no program of interest to his constituency — a private conservation group. The professionals often prefer talking to themselves to arguing with potential opposition. So we've invited the opposition! This session is entitled "*A common ground — dialogue between conservation groups and management agencies.*"

The panelists have been selected for their ability to enjoy and encourage discussion. We have two conservation groups, The Sierra Club, represented by Mr. Robert Hughes the National Wildlife Committee Chairman; the Audubon Society represented by Dr. Roland Clement, Executive Vice President; and two management agencies represented by Mr. Herbert Doig, Director of the N.Y. Division of Fish & Wildlife, and Mr. Earl Baysinger of the Bureau of Sport Fisheries and Wildlife. Mr. Phillip Barske of the Wildlife Management Institute will moderate the session.

Conservationists and sportsmen, here is the chance to actually hash out your problems with the professionals. What we really hope for is a mutual understanding of what the groups are doing and how they can combine energies on some of the urgent problems confronting wildlife.

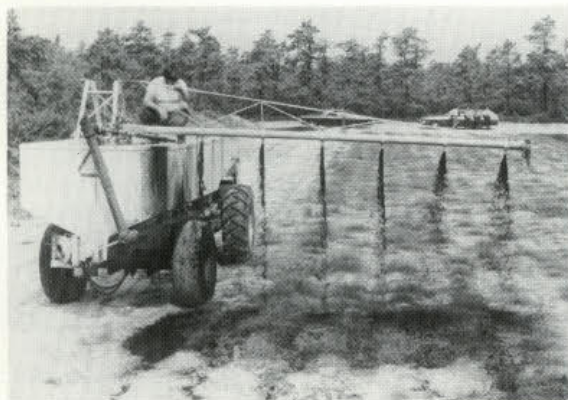
There will be much to select from at this conference. On Wednesday, Feb. 27, Mr. James Davis of the National Wildlife Federation will give a talk on "*Inviting Wildlife Into Your Backyard*", based on the article published in *National Wildlife*. We're also trying to arrange for an outdoor cook to speak on preparation of game. In addition, the Playboy Club offers a wide variety of entertainment. We are scheduling a talk by the Bunny Mother, a talk on makeup and beauty secrets and hairstyling. Mrs. Russell Cookingham, the wife of the Director, will hostess a ladies cocktail hour. For the more energetic, Great Gorge Ski area is open to those registered at the Conference.

We hope to blend the mind stimulating with the mind soothing so that everyone can participate and enjoy the conference. The "Ladies" program is not geared just to the ladies. Sportsmen and conservationists should find much to enjoy and be stimulated too.



SLUDGE *for wildlife*

by PAUL D. McLAIN
Federal Aid Coordinator



Spray irrigation apparatus applying digested sewage sludge to plots planted in Bermuda grass.



Lush growth of pasture on left that received sludge application. Right plots received nothing.



Ground water being checked for movement of pollutants from the sludge.

The New Jersey Division of Fish, Game and Shellfisheries is presently engaged in one of the most challenging research projects ever to face the division biologists. As part of the Upland Game Federal Aid to Wildlife Research Project, a three-year cooperative study is underway to determine if treated sewage sludge can be utilized as fertilizer as a soil building agent on wildlife management areas.

In the field of wildlife management it is known that wildlife is the property of the soil. It has also been observed many times that on the highly productive soil types where the food and cover plants are rich in nutrients and grow in profusion, that wildlife populations are healthy and usually present in good numbers. But on low quality soils wildlife populations are at the minimal level and frequently suffer sizeable annual losses due to the reduced "carrying capacity" of the soils providing sufficient over-winter food and cover. Deer are a perfect example: In the rich farmlands of northern New Jersey the deer herd is larger, has a higher fawning rate, and there is seldom an over-winter loss due to poor quality range. In southern New Jersey on low quality soil the herd is limited in numbers, the animals are smaller, the reproductive rate is lower and frequently an over-winter kill results because of the lack of sufficient browse to carry the herd through the bleak winter months.

On wildlife management areas in southern New Jersey one of the principal management programs has been to try to increase the carrying capacity of the lands through clearing, liming, fertilizing and planting of quality wildlife food and cover crops. Fertilization by commercial fertilizers has been the key to the production and maintenance of wildlife food. However, on a large scale management program the cost of applying commercial fertilizer to lands is extremely expensive. Cost figures vary, but it's estimated that it requires at least 600 pounds of 5-10-10 fertilizer per acre for planting and top dressing, and the cost of application can be upwards of \$50 per acre per year for fertilizer.

For a number of years division biologists have recognized the need for large scale fertilizer applications on the low quality soil of some of the division's wildlife management areas, but fertilizer costs and application have presented an almost insurmountable problem. A possible solution could be the use of sewage sludge as a soil building agent.

As regional sewerage treatment facilities were planned for Ocean County, it was estimated that by 1985 there would be a flow of 92 million gallons of sewage a day with a yield of between 60 and 70 tons

of dry sludge per day or about 25,000 dry tons per year.

The questions arose of what to do with the vast quantity of treated sludge? One answer would be ocean dumping off-shore. This would mean the trucking and barging of the sludge many miles out in the ocean. A second answer was incineration which is highly expensive, and a third possibility was land disposal.

In the summer of 1972, Director Russell A. Cookingham, Federal Aid Coordinator Paul D. McLain, and Francis Schuler of the Fish and Wildlife Service Branch of Federal Aid, met with John Fellows of Fellows, Reid and Weber engineering firm for the Ocean County Sewerage Authority, and they agreed that the division should investigate the possibility of utilizing treated sewage sludge on state wildlife management areas on a limited and experimental basis.

The division of Fish, Game and Shellfisheries, and the engineering firm of Fellows, Reid and Weber worked up a series of work plans and job outlines as study parameters. Rutgers University was contacted through the Ocean County Sewer Authority, and expressed a desire to become part of the study. At the same time the U.S. Geological Survey was contacted and joined the study with an interest in the effect of the sludge application program on the underground water table.

Before preparing the study plans, Director Cookingham discussed the possibilities of sludge disposal on division wildlife management areas with the Fish and Game Council, and they authorized small and experimental test sites on Colliers Mills and the Greenwood Forest Wildlife Management Areas. The Division of Environmental Quality reviewed the project and agreed to cooperate in ground water studies and review and issue permits if necessary.

The Ocean County Sewerage Authority presented the study to the federal Environmental Protection Agency and they provided a \$200,000 grant; the Ocean County Sewerage Authority contributed \$300,000. The balance of the study was financed with grants and services from Rutgers University, the U.S. Geological Survey, the State Division of Environmental Quality, the Division of Water Resources and the Division of Fish, Game and Shellfisheries. At present, the Division of Fish, Game and Shellfisheries is spending about \$16,000 in Federal Aid to Wildlife Restoration funds and providing the land as part of their contribution to this million dollar sludge study.

It is estimated that the study will require about 3 years; and over 150,000

separate tests will be necessary before conclusive data can be presented relative to the sludge effect on the ground water table, the soils of the area, the vegetation, the wildlife resource and the esthetics and public's attitude toward this type of land management.

The actual field work was started in the winter of 1972 when the Division cleared three sites of about one acre each at the Colliers Mills and the Greenwood Forest Wildlife Management Areas. The sites were selected because they represented typical Lakewood, Woodmansie and Downer Sandy Loam types of soils. Also the Geological Survey determined that the location and flow of the underground water table was suitable for test well evaluation. The areas were also near hard surface roads which provided easy access for the mechanical spreading equipment and the delivery of the sludge. Also the public would be afforded an opportunity to witness the operation.

Frank Tourine, Assistant Wildlife Biologist, was in charge of the Division's field program and overall input into the sludge studies. He worked closely with the university personnel, the Ocean County Sewerage Authority and the engineers to develop the study sites at Colliers Mills and Greenwood Forest Wildlife Management Areas.

Following weeks of intensive exploratory ground studies at both Colliers Mills and Greenwood Forest several sets of experiments were established. The following is a summary of the experimental sites and the application procedures for testing the treated sewage sludge.

At each of the three sites at Colliers Mills and Greenwood Forest there are three cleared 1/4 acre plots and a 1/4 acre plot of native vegetation. The cleared plots received an annual per acre application of 10, 20 and 40 tons of sludge. The native vegetation plots received an annual application of 20 tons per acre. Bermuda grass was planted in the cleared plots to provide deer forage as well as utilize the nitrogen and other nutrients in the sludge.

In addition to these plots, a second group of experiments was undertaken at Greenwood Forest. A half-acre site was cleared of vegetation and divided into 15 plots, and then fenced to exclude deer. The plots were limed and planted in field corn. Sludge was applied to the plots at the rates of 10, 20, 30, and 40 dry tons per acre per year. Corn yield variations from the different treatments was measured.

Twelve study plots were established in a scrub oak area at Greenwood Forest to determine if sludge applications will in-

crease acorn production. The scrub oak plots are being treated with 20 and 40 tons of sludge per acre per year. Acorns will be collected and counted annually.

Another group of plots was laid out in established permanent pasture at Greenwood Forest. Yield variations of the pasture will be determined from plots treated with 10, 20 and 40 tons of sludge per acre per year. Part of the area will be fenced to exclude deer. A determination will be made whether the deer prefer the treated or untreated pasture.

Sludge applications began in May 1973 and will continue until the fall. About 10 applications at three week intervals were needed to attain the desired annual sludge rate. A specially designed tanker with spray looms was used for the applications. The material is approximately 5 percent solids and resembles crude oil. The sewage treatment process composts the raw sewage into a form that has an inoffensive earthy odor and does not attract flies or vermin. After being applied, the material dries within a matter of hours and looks like ash flakes.

At this writing the data collected of the first spring and summer application of treated sewage sludge are being tabulated, summarized and reviewed. It's too early to make definite conclusions, but preliminary findings and visual observations indicate that the use of treated sewage sludge has resulted in a definite growth increase in the permanent pasture planting and that initial plantings of Bermuda grass are responding to various sludge applications. Exact information on growth rates, harvest yields, seed production, chemical content and utilization of the various plots will be available in late winter. In addition the data on the effect of the sludge applications on the underground water table will provide guidelines of this important phase of the investigation.

As in almost any field study the first year presents problems in coordinating the efforts of the various researchers, obtaining equipment and manpower, and generally getting the show on the road. Based on experience and information obtained in the initial year of this investigation, the next two years will further refine the application techniques, study procedures and ground testing experiments which will help answer the question, "Can treated sewage sludge, if properly applied and monitored, be utilized to improve the quality of the wildlife habitat and also partially solve one of the most difficult problems facing the urban areas: how to economically and practicably dispose of sewage sludge so it is a complement to the environment."

The Greening of New Jersey

The Vegetation of New Jersey by Beryl Robichaud and Murray F. Buell. Rutgers University Press, 1973, 12.50.

Thomas Budd, an early apologist for New Jersey, wrote in 1685 of whale fisheries on the Delaware Bay and of "[river] water, clear fresh and fit for brewing or any other use". Budd's tract, *Good Order Established in Pennsylvania and New Jersey* was directed to potential colonists; it spoke of land crying out for the plow and of sites favored for industry and trade. Subsequently, the people came and came. By 1726 there were 32,442 inhabitants in New Jersey, by 1784, 149,435. Today, with an average of 954 persons per square mile, New Jersey is the most densely populated state in America. Such teeming countries as India and Japan do not equal this density. Not only does our state bear the weight of more than seven million people, it also supports an amount of concrete and macadam unmatched by any comparable area. It seems a miracle, and is a tribute to the "persistence of grass," that so much greenery still meets the eye.

The origin and the character of New Jersey's greenery is the subject of the recent book, *The Vegetation of New Jersey*, published by Rutgers University Press. The authors, Beryl Robichaud and Murray F. Buell are active in ecology and environmental programs at Rutgers University. Authoritative and well organized, their book is useful for its facts; well written and attractive in format, it also provides for fascinating reading. The first part of the book is devoted to a general treatment of the geological, biological, climatic, and human influence on vegetation. Throughout, the text is amplified with charts, tables, illustrations and excellent photographs. How much more meaningful a discussion of extinct glacial lakes becomes when it is flanked by a photo of the Great Meadows. A cuesta hill formation is brought to life in a photo of Arney's Mount. The authors introduce a different classification scheme, terrestrial habitats; these are defined by characteristics such as soil type, moisture, drainage, elevation and temperature. Some of the classifications cover salt-water marshes, North Jersey bogs, North Jersey uplands, South Jersey flats (the Barrens). Thus, after reading the initial general discussion, a reader may turn to the geographical area of his special interest. He will discover which plants thrive in each habitat and why, and the authors constantly point up man's impact on these habitats. For instance, the modern practice of controlled burning of woodlands for conservation purposes turns out to be a technique used also by the original Indian inhabitants of the State. Repeated burnings of an originally oak dominated habitat leads to a pine dominated one; hence the development of the Pine Barrens. Did you know that the Gypsy Moth, currently devastating our oak forests, was introduced into the USA by a scientist seeking to improve the silkworm industry?

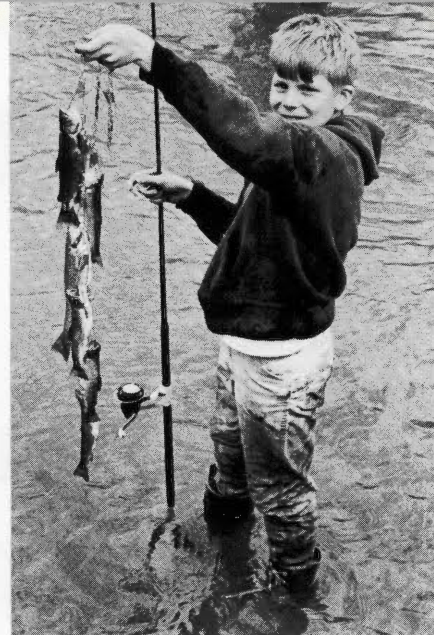
The final chapter assesses the future of vegetation and man in New Jersey and the authors offer some guidelines for peaceful co-existence. *The Vegetation of New Jersey* is, in the best sense, a popular book about a scientific subject. This year saw the re-printing of Witmer Stone's massive and scholarly, the *Plants of Southern New Jersey*, a great reference book for local library shelves. *The Vegetation of New Jersey*, on the other hand, is a good book to own, valuable for reference and for browsing.

Charles Perrone
Burlington County College

A NEW FISH HATCHERY *a must*

By Bob McDowell

A new fish hatchery is a must for New Jersey if we are to meet the recreational fishing needs of a growing population and restore natural stocks of trout that are continually being diminished by a variety of means. Our present hatchery, the Charles O. Hayford State Fish Hatchery located in Hackettstown, was opened in 1912. From its opening through the early 50's the hatchery was one of the largest producers of trout in the country. Today, on the basis of modern standards, the Hackettstown Hatchery has become antiquated and inefficient.

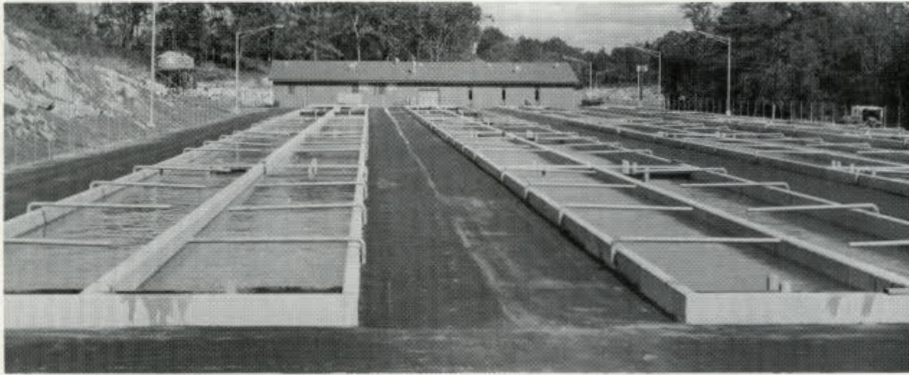


This young fellow's trout fishing future depends on the Division of Fish, Game and Shellfisheries' ability to produce good numbers of healthy trout. This can only be done if a new or renovated hatchery is built.

Nationwide, fishing is the second most popular form of recreation, with a total of more than 33 million people participating. New Jersey has an estimated 1.5 million fisherman, salt and fresh water, who take to our waters annually. In the Garden State, three quarters of a million people fish in fresh water and of these one-quarter million are trout anglers. The fresh water angler figures include half a million children who are not required to purchase a license. Approximately 200,000 children fish for trout each year.

To meet existing demands of the fishing public, the Division of Fish, Game and Shellfisheries has been stocking an average in excess of one-half million catchable sized trout annually; most of these fish have been raised at the Hackettstown Hatchery. This past year the hatchery produced its 45 millionth trout. In recent years the production of trout has been accomplished under increasingly difficult conditions as the inefficiency of the operation has been compounded by economic infla-

There are concrete rearing raceways at the hatchery but most are victims of old age and are of poor design, by modern standards.



The Big Spring Fish Hatchery in neighboring Pennsylvania is compact, clean, is easily maintained and produces as many fish as the Hackettstown hatchery.

tion and increasing production problems. Old style rearing ponds with dirt bottoms present both disease and maintenance problems; and the water sources of the hatchery, which includes both surface streams and springs, are affected by the encroachment of surrounding housing developments and have produced uncertain water flows of unpredictable quality. These conditions have made production of trout difficult. The old dirt bottom ponds not only harbor disease carrying organisms, but do not allow for rapid removal of nitrogen and fish waste and a large work force is necessary to maintain the hatchery and raise trout under existing conditions.

The result of these and related problems is a high cost of producing fish. Our cost averages about \$1.17 per pound, compared to a cost of 70-80 cents per pound for states whose hatchery facilities have been modernized. In a new hatchery, such as the Big Spring Hatchery in Pennsylvania, the all-concrete rearing ponds or raceways are easily cleaned by a small work force. Disease is kept to a minimum and when it does occur, is more easily treated. The fish are easily fed with a mechanical blower mounted on a pickup truck requiring effort of only one man. Also, most fish will reach catchable size in 18 months rather than the 24-month period now required at Hackettstown. Wells or de-

pendable springs, producing large quantities with high quality, are the usual source of water. All these factors add up to a more economic operation.

Since water is the life blood of a hatchery, the division has undertaken a program of water exploration. With the cooperation and supervision of the Division of Water Resource's Bureau of Geology, test wells have been drilled at several sites including the old Hackettstown hatcheries. Completed preliminary engineering studies indicate the need to build a new hatchery to meet existing demands for trout. Renovation of the old hatchery was considered, but the engineering study recently completed demonstrated that poor water quality and quantity virtually rules out this possibility. According to this study, the cost of this undertaking will be roughly three million dollars to produce 200,000 pounds of trout annually. This production figure is the estimated requirement to meet public demands. The cost would be too great to finance through

Many children, each year, receive their first lesson in "basic biology" when they take a trip to the hatchery. As many as 100,000 people visit the hatchery each year.

photographs by Harry Grosch

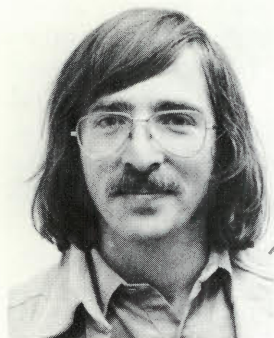
the sale of fishing licenses alone; therefore, funds from other sources must be found. A direct appropriation from the general fund, a bond issue or a long-term loan from the state treasury offer possibilities which will be explored.

The state fish hatchery benefits more than just the license holder. Thousands of children also fish in 25 streams and ponds stocked by the division. In addition, an estimated 100,000 school children and adults visit the hatchery each year for an educational experience. The existing energy crisis may restrict many New Jersey residents who normally travel to adjacent states to fish; thus confining them to New Jersey waters and imposing an additional demand on our fisheries resources.

Any plans for a new hatchery will include an outdoor education center with facilities to handle the larger number of people a new installation would attract. This center would serve to inform and educate the public about all the wildlife conservation programs of the division. This would be done with displays, an audio visual center, a system of exhibits, nature trails, guided tours and wildlife observation areas.

A new hatchery is a MUST for New Jersey. Using the money and manpower saved on more efficient trout protection, more effort could be directed to the protection of our fishery resources and their natural habitat. In this way large numbers of future fishermen would be more fully guaranteed a reliable recreational activity.



**CHARLES HIGGINS**

The basic problem is lack of understanding by the public and a large amount of apathetic feelings. The only real information seems to go to the hunters and not the general public. There seems to be a lack of communication with the public about the practices of wildlife groups and a general out-of-touch and out-of-mind thinking.

**NANCY LAURY**

I feel that many people feel that they, as one person can not get anything done as an individual. Also the problems are getting so big that many people don't know where to start in fighting them.

**CHERYL PEARSON**

I don't feel there's confusion as to 'how can I contribute' or 'who should be responsible.' The people trained to make these decisions should be responsible. There are many interested people but they think they know more than the biologists or else they just don't believe them. As to 'what should be done' and 'how can it be accomplished', these are problems for the trained person. As an 'interested observer' I should not be confused if I listen to what is being said and think about it logically.

CONSERVATION

by Steve Perrone and Leonard Wolgast

*Associate Professor of Wildlife Biology
Rutgers University*

During the past year or so there has been an explosive student interest in conservation and the environmental sciences.

According to the spring issue of The Wildlife Society Bulletin, total fall enrollment in wildlife curricula increased by 23.2 percent in 1972. These figures were supplied by 72 reporting schools from coast to coast.

When the 1973 totals become available, we feel the percentage increase should top the 1972 increase by a substantial figure. This prediction is based upon the increasing student interest exhibited in wildlife options since 1968, and the steep climb in enrollments in courses relating to the environmental sciences at Cook College, Rutgers University in the Fall 1973 school year.

**RANDY WEEMS**

The ecosystem is probably not fully understood, and there are people with vague, incomplete, or misformed opinions on questions of conservation. Anyone who is interested in finding out what they can do should contact any agency on conservation.

**ANTHONY TELIS**

The biggest problem is what can I do. There should be more information on how people can prepare and get into positions in wildlife management.



KATHERINE ANTONITES

There is confusion between the many problems in the areas covered by ecology and conservation. Many people would like to help but have no idea of what they can do.

TOM NARY
The idea and practice of wildlife management is fairly new since the problem with conservation has been realized for less than a century. Experimentation as to what and how things should be done is essential, so that a balance can be reached between man and his environment.



AND THE COLLEGE STUDENT

photographs by Harry Grosch

Because we would like to better understand this phenomenal rise in environmental science enrollment, we designed a questionnaire which was distributed to over 500 students.

The students surveyed were enrolled in courses relating to the environmental sciences such as: "Wildlife in the Modern World," "Wildlife Ecology and Management," "General Ecology," and "Forest and Wildlife Conservation."

Sixty-two percent of the students surveyed were majoring in some aspect of the environmental sciences; the others were majoring in education, medicine, economics, engineering, etc., and taking the environmental science courses as electives and because they were particu-

larly interested in the environment and the conservation of our natural resources. Several students said they were contemplating a switch to a wildlife major.

The questionnaires were designed to (1) elicit opinions from the students on environmental problems; (2) ask the students to indicate their interests so we could determine the composition of the classes; and (3) to measure student exposure to national and local wildlife communications and organizations.

For example, question No. 1—Do you feel there is some confusion in this broad area (Ecology/Conservation) as to "what can be done," "how can it be accomplished," "who should be responsible," and "how can I contribute?" Some of the student responses were:

"I think most people can agree on 'what should be done'. Too much bureaucracy and incompetence hinders the 'how can it be accomplished' and 'who should be responsible.' If the question 'how can it be accomplished' is not satisfactorily answered, then people can not be sure of just what they can do to contribute."

"I feel that most interested organizations are more talk than action, and that no one knows exactly what is able to be done by their organization without stepping on someone's toes. A lot of people who might be interested in helping out just don't know where to go, or who to contact. And many organizations try to tackle a project that is much too broad in scope for them to handle adequately."



RICHARD GLONEK

When a large number of so many small local ecology/conservation groups exist they may all hold the same basic goals, but vary greatly in their directions, backgrounds, and philosophies.



Professor Wolgast lecturing to a wildlife biology class at Rutgers University.

"People are becoming more aware and interested in conservation but most have different ideas as to what is the best method to follow. For this reason confusion is apparent. . ."

"Yes, very much (confusion), due to a lack of education on the subject (conservation)."

"The basic problem is ignorance and/or indifference of most of the population."

"I'm not confused about what should be done in most cases, but how can I stop the destruction, pollution, etc. . . that is going on right now."

"It is the responsibility of each individual. A genuine appreciation of our resources is necessary to make conservation effective."

"I feel there is confusion. Everyone is being made aware of our ecological situation but not enough is being done to educate the people on what to do about it."

"The problem seems to be, who will finance the replenishing of the renewable resources."

"Yes, I would say there is much confusion. I believe that most of the public doesn't understand exactly what ecology or conservation mean."

"I feel that more people besides the conservationist should be more aware of the environment and learn to take care of it and respect it. So many people have so many ideas (about the environment). But nothing seems to be getting done."

"I definitely feel there is confusion particularly on who will decide what action is to be taken. There does not seem to be a happy medium between scientist and experts who know what should be done, and the goals. Who can finance and set plans in motion?"

To question No. 2— Do you hunt, fish, hike or bird-watch?—the answers were:

<i>Hunt</i>	<i>Fish</i>	<i>Hike or birdwatch</i>
20%	57%	75%

The answers revealed that only about one-fifth of the respondents are hunters and approximately one-half are fishermen. This was generally true for both wildlife majors and the others.

The intense student interest in our environment and conservation has almost doubled the wildlife options enrollment in the environmental science classes.

This dramatic increase has resulted in several changes in the makeup of the student body. First the male-female ratio in this area was once about 10 males to 1 female; now it is 4 males to 1 female.

And, several years ago, most of the students enrolled in the environmental sciences were hunters and fishermen. Today, many, if not most of the students are "non-consumptive" users of our resources. We think this is a healthy trend—maybe we're starting to reach the general public and this increased enrollment of all types of students is a response.

Our question No. 3 was a series of questions answered as follows:

Are you a member of a local or national wildlife/conservation organization?

<i>YES</i>	<i>NO</i>
10%	90%

Are you aware of any local or national wildlife/conservation publications?

About 65-70 percent are aware of various publications although not all could identify them. Most of the identifications were "Field and Stream," "Outdoor Life," "National Wildlife" and "New Jersey Outdoors."

Do you receive, read or subscribe to any wildlife conservation publication?

<i>YES</i>	<i>NO</i>
33%	67%



MARIE BALTZELL

I would like to help conserve our natural resources but I don't know where to go to help out. I think wildlife conservationists should have more publicity. Also, many times the government overrules concerned citizens and destroys the land anyway. Therefore, I think they (conservation groups) should have more support.

The magazines most read in the order of frequency:

1. New Jersey Outdoors
2. National Wildlife
3. Field and Stream
4. Outdoor Life
5. Conservationist (New York State)

And what did we learn from this survey that we didn't already know?

Possibly nothing brand new because we had been observing changes in the student body over the past several years. But we measured these changes and our figures are revealing. And more importantly, we communicated with the students, and learned that they are very much interested in their wildlife heritage. And they don't want to be sideline spectators, they want to participate and want answers as to "how" and "where" they can contribute their energies and talents.

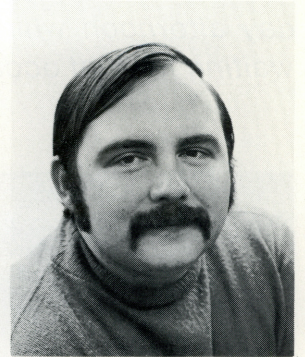
If it is agreed that youth is a precious resource that we cannot afford to waste, then we need some information and education programs directed to college audiences from coast to coast. The hope of all conservationists is in the educating and motivating of an informed public. What better starting "public" than our ten million students?

Some eloquent comments pertinent to this article were provided by Nathaniel P. Reed, Assistant Secretary of the Interior for Fish Wildlife, and Parks at a World Wildlife Fund dinner not too long ago. Mr. Reed said: "These components of the new generation are not the spiritual heirs of their parents. They do not recognize as barriers the many languages and colors they come in. But they do identify with endangered wildlife."

"They join few of the fights of their fathers, but *ours* is a battle they understand and applaud."

"They are greedy, these youngsters who watch us, not for money or fur, but for life; and are jealous of their allotment of it."

"They see an environment in disrepair and a value system in disarray, and they are judging us, as stewards of the earth they will inherit."



GREG M. BREMUS

People want to help, but the average man doesn't know what to do, or what is right.



GRACE CALABRESE

It seems that there are a lot of people talking about it, all flying off in different directions. That's only natural, but there has to be some unifying force or body to agree on the things to be done, and then go ahead and do them.

Remember the good times we had at the beach last summer? And what about the boating and fishing trips in the bay? Can you recall anything tastier than that fresh flounder we caught on that lazy Saturday afternoon while drifting in the warm sunlight and waiting for that occasional breeze to cool us off?



Joel Aronson



Harry Grosch

There were hundreds of boats out on the bay that day . . . and everyday. And remember your comment on the throwing of beer cans, plastic bottles and silver foil overboard from many of the boats around us.



Harry Grosch

You said someday they'll come out here and won't be able to get their fishing lines into the water because of the beer cans, plastic bottles and other debris covering the entire surface of the bay. They'll have to push the cans and bottles aside to get their lines in the water. Except there won't be any fish because the bottom of the bay will be covered with beer cans and bottles, and the fish won't have anything to feed on. We all kind of laughed at your fish story, but we got the message.

GOING... GOING... GONE

To underline the urgency and importance of managing our coastal zones in New Jersey, we are publishing an edited version of a presentation on "The Question of Recreation in the Coastal Zone" by a distinguished conservationist, Mr. John S. Gottschalk, executive vice-president of the International Association of Game, Fish and Conservation Commissioners. The paper was originally presented at the Conference on Organizing the Coastal Zone, June 14, 1973 at Annapolis, Maryland.

The Question of Recreation in the Coastal Zone

BY JOHN S. GOTTSCHALK

At the conservation education center of Sir Peter Scott's Wildlife Trust in England a sign proclaims that the self destruction of the human species will result from its three greatest dangers: world-wide pollution, overpopulation, and boredom.

Social workers and sociologists since early in the industrial revolution have recognized that the more man becomes the victim of job monotony and economic regimentation, the greater will be the social need for relaxing and satisfying physical and psychological recreation. Accepting these conclusions seems reasonable, but what relevance do they necessarily have to coastal zone problems? *The National Estuary Study* completed in response to P.L. 90-454, identified the factors which make the ocean's edge a unique feature and attraction to so many people. The conclusion was that the estuarine portions of the coastal zone, do indeed have special attractions to many people. There is no single common denominator, however, save possibly the vastness of the ocean and its adjacent marshes and bays. The enormity of these great expanses seems somehow to appeal to man's need for a time and a place for an expansion of the human spirit. Closed in as the urban resident is for so much of his existence by the physical limitations of his four walls of tenement or shop, and by the psychic limits of the teeming city, the appeal of the "wide open spaces" of the seashore is not difficult to understand.

In concentrating on the littoral of the sea or estuary, developments of the type we normally envision—homes, resorts, and a variety of industrial activities, run headlong, into and conflict directly with the requirements of most coastal zone recreation. "Development" reduces the capacity of the coastal zone to support recreation. Total development leads only to one end: total destruction. That statement may be subject to reservations, but they are reservations of degree, not absolute effect. One squatter's cabin perched on a hummock in a marsh destroys the productive capacity of the piece of wetland it sets on. Alone in a marsh of any great magnitude, the single intrusion would have no easily measurable effect. But thousands destroy a marsh and those parts of the ecosystem associated with it.

Our "development" of the coastal zone has long since gone beyond the point where we are concerned about isolated instances. We are looking at wholesale invasion! We have extended ourselves into the coastal zone in a geometric progression. In so doing, whole chunks of the coastal zone have been and are being occupied by dwellings, roads, parking lots, factories, dumping grounds, offices, or whatever. The barely-treated effluent and trash of mobs of humanity reared in a "throw-it-away" society foul the water and litter the beaches. The nauseous odor of raw or lightly treated sewage now drifts with the breezes over famous beaches from Waikiki to Coney Island. "Red



Joel Aronson

Remember that cove at the north end of the bay where we always caught our share of fish no matter how bad a fishing day it was? It's gone. They filled it in and I understand they're going to build some condominiums there. Needless to say, the fish are gone, too.

tides", a sure indication of deadly pollution, kill fish and clams, undermine the economy of fishery dependent communities, and depress tourist business. Tawdry buildings and blatant billboards mar the roads and streets in many a resort area.

To recapitulate: dredging, filling, and pollution reduce or destroy the estuarine ecosystems. The attractions of the natural wildlife, from ospreys to bluefish to horseshoe crabs are diminished or destroyed. Pollution fouls water and air with its stinking toxins. The landscape is defiled. These impacts on the coastal zone are categorically catastrophic. In short, in all but a handful of carefully "developed" areas, the impacts of gross development run counter to the needs of outdoor recreation.

It is the fact that more and more people have come to understand this debilitating effect of "development" that has brought us to the point where rational management of these areas has become a matter of high national policy. If we were discussing converting a forest to a cornfield, we might lament the disappearance of the native oaks and hickories. We would not, however, be facing the irreparable loss of the soil's ability to regrow the forest. By contrast, when an estuary is dredged or filled, its innate productivity is destroyed, usually forever. There is thus a fundamental difference between the terrestrial and aquatic biospheres that has escaped the understanding of many people.

If it appears that these remarks are excessively biased

in favor of protection of the environment, be assured that "conservationists" are not opposed to the enjoyment of the seashore or the cautious use of the coastal zone. It is just that we do not believe in, indeed we reject, the concept that everyone has to dwell on the water's edge. We believe it is much more logical and practical, and economical in the long run to keep "development" away from the beaches, the tidal marshes, and the estuaries. To do so would open vast areas of the coastal zone for public recreation. The service developments: homes, resorts, shopping centers, can be placed inland at any distance necessary to protect the natural environment. This does not mean that trails, bath houses, and similar facilities, even parking lots in areas where mass transit is not feasible, could not be built. Within limits, these developments can be non-destructive. Careful planning of their location and size in relation to natural features such as forest, dune, and tide could give them attributes of a positive nature.

To many of us the alternative of taking immediate and drastic steps to curb the unwise exploitation of the coastal zone is society's only legitimate option. Any other course will eventually lead us to the point where, in the manner of mankind throughout history, we will have destroyed that which we love. It need not happen, but it will without an understanding that we cannot accommodate all of man's relentless demands for the use of the coastal zone without irreparable harm. At his center on the River Severn Peter Scott has hung another sign, this one over a mirror. It says



Harry Grosch

And you know those shallows among the tall grasses where we always caught crabs — rain or shine. They're gone, too. Filled in and bulldozed into a large flat sandy field. Building a resort complex there, they tell me. Sure was a great place for crabs.

Of course, as you were saying, if they keep developing, filling in, and polluting, the whole bay will become a sewer, the fish will die, and who will want to go sailing in a sewer? And with no recreational opportunities, who will want to live here . . . or even visit? It's hard to imagine it coming to that, but . . .

"You are looking at the most dangerous and destructive animal the world has ever known."

This entire discussion points to the two most critical needs in coastal zone management. One is the need to fill the voids in our information, knowledge and understanding of many facets of actual and potential coastal zone usage. Management may be defined as a system of attaining identified goals through a series of conscious decisions based on facts. Our storehouse of facts on human recreation is far from full. We need to expand our understanding of man's dependence on various kinds and amounts of outdoor recreation; we need to measure the extent of the contribution to this dependence of the various present and potential uses of the coastal zone. Such measurement must be predicated on an economic evaluation technology that reflects the worth of public non-marketplace resources.

The second is that while we wait for these facts, and a will-o-the-wisp federal program to finance their acquisition, we should apply a moratorium on further significant development in the coastal zone. Several states have already come to this conclusion—Washington, California, and Delaware that come immediately to mind. (New Jersey has passed some landmark environmental legislation—see comment in box) Most such developments from the economist's viewpoint are liabilities in the long run. It is beyond comprehension that we permit and even encourage construction on storm prone beaches only to have them

Harry Grosch



"bailed-out" by federal disaster funds after the storm has struck. It would be far more sensible to take the same money in the beginning and acquire title or use rights to these ephemeral areas in the name of the public.

In doing so we have not thrown away our options. We have left them open for the future. Meanwhile, we need to do our absolute best to build a protective system that will keep intact, for future use and enjoyment, the priceless assets of the coastal zone.

N.J. ENVIRONMENTAL LEGISLATION

Comment: New Jersey has responded to public demand for a decent environment by passage of the Coastal Area Facility Review Act, signed into law by Governor William T. Cahill on June 20, 1973. This law is designed to balance environmental and economic requirements in a coastal region by regulating the type and location of planned construction for industrial, commercial, residential or public facilities. Other landmark New Jersey legislation in this broad area includes the Water Quality Improvement Act, the Pesticides Control Act, the Clean Ocean Act, the Noise Control Act, and the Wetlands Act. Information on environmental legislation can be obtained by writing:

*N.J. Department of Environmental Protection
Box 1390
Trenton, NJ 08625*

MY DARLING CLEMENTINE AND OTHER BIRD DOGS

By Henry Schaefer

During a span of 50 years of hunting a man gets to own a number of good dogs, if he is lucky. He will also get some that don't turn out too well and a few will be remembered as having really been great, at least in his own opinion.

Fashions change with bird dog breeds, just as they do with women's clothes. However, they don't change quite as fast, although the reasons for the changes are often equally mysterious. By that I mean that breeds that were considered best when I first started hunting, may be en-

tirely adequate today but no longer in fashion. For example, you don't see many Irish or Gordon setters in the fields any more.

While my first hunting dog was a black and tan coonhound, which really belonged to an uncle, and while I have had quite a bit of experience with hounds and waterfowl retrievers, I am primarily a bird dog man.

Right at the beginning let me make it perfectly clear that I am not looking for an argument. Don't expect to read here that this breed, or maybe that other breed, is no good. It doesn't work out that way.

All of the breeds that have been developed for the various types of game are good. Also, most dogs turn out to be able performers provided they are given sufficient hunting exposure and provided also that the owner doesn't ruin the dog. In most instances if a dog is no good the fault lies with its owner.

I learned a long time ago not to laugh at any kind of mutt, no matter how improbable it looked. I've known nondescripts of all sizes and shapes that worked well on game, some very well.

My first good pheasant dog was an Airedale terrier named Rex. He had a fine nose and was a relentless trailer. He was also fast as a bullet, but in those days I was quite fast too. But I am not recommending Airedales for pheasant hunting.

In general, if your game is going to be primarily rabbits, get a beagle. If the game is going to be primarily pheasants, the recommended best breeds today are German shorthaired pointers and Brittany spaniels. At one time the English pointer reigned supreme with quail fanciers. It is



Miss Lillian Schaefer with Clementine, German shorthaired pointer, about 1954. Shorthairs were at that time just starting to become popular with upland hunters.

photographs by the author



The author with the largest bird he ever shot, a wild turkey gobbler on a Sussex County commercial game preserve around 1950. The bird, which had been stocked under the preserve's state license, weighed 12 pounds. The dog was Fritz, a german shorthaired pointer whose specialty was woodcock and clapper rails, and who was badly frightened by the turkey.

The most popular shooting dogs in New Jersey today are shorthairs and Brittanies. You can verify this yourself by a tour of any of the wildlife management areas during the open season.

The future of the Brittany, in my opinion, is brighter than that of the shorthair because too many people today are trying to "improve" the latter.

The shorthair is due for a skid, just as the setter has skidded, but not for the same reason. The position of the shorthair is shaky because too many breeders are intent on developing greater speed. When the first shorthairs came to this country some 30 years ago they were comparatively slow, with moderate range, and inclined to trail rather than to run to pick up body scent. They were general-purpose dogs.

They achieved almost instant success on the commercial shooting preserves because of their short but thorough coverage of the range and ability to trail and retrieve crippled birds. They were so slow anybody could keep pace with them. They were anything but flashy but those old



still the number one quail breed, but hunting for this bird has undergone a change during the past two decades.

Coveys don't seem to spend as much time in the open fields as they used to do. In the old days nobody ever followed quail into the woods. Nowadays a good part of quail hunting is in the woods where a fast, wide ranging pointer isn't much help. Therefore, closer ranging dogs of whatever breed are preferred by many of today's quail hunters.

The English setter, once the most popular bird dog of all in New Jersey, is still the favorite with woodcock and grouse hunters. However, puppies from good hunting stock are difficult to find.

This is simply a word of caution. A beautiful dog, bred primarily for bench show competition, may turn out to be an excellent hunter. However, when breeders are interested primarily in the appearance of the animals, their individual hunting abilities are apt to be overlooked, or unknown.

There is no question in my mind but that setters have declined in popularity with hunters as it became increasingly difficult to buy puppies from good hunting stock.

This is also true of springer and cocker spaniels. I owned two springer spaniels, Mitsy and Butch, both were excellent pheasant dogs and also served well on woodcock and grouse, but the next two springers were worthless.

One grew to be a beautiful dog, but had next to no scenting ability and refused to retrieve from water. The other persisted in chewing to mincemeat every bird that it could get into its jaws.

The author's first "bird dog," an Airedale terrier named Rex with a brace of pheasants taken at Mt. Airy, Warren County, about 1931. The car was a Willys Overland which occasionally attained speeds in excess of 40 miles per hour.



Mitsy, a liver and white springer spaniel. An industrious, close working professional as she looked in 1938.

“meat” dogs made the difference between profit and loss in pheasant preserve management.

The rise of the shorthair was not as meteoric as that of the Weimaraner, a breed imported later, but has lasted much longer. The Weimaraner was, and is, a fine hunting dog but the claims made for the breed were so fantastic people who bought them were disappointed when their own puppies developed into hunting dogs rather than super dogs.

I bought my first shorthair, a solid liver-colored bitch named Clementine, in 1947. To say I was pleased with her would be a monumental understatement. She had a light frame for shorthairs of that day and was fast for her breed.

However, she could not compete with English pointers or setters in the speed department, and the only time she ever placed in a field trial was when she ran just against other shorthairs. She won second, mainly because of a long and difficult retrieve.

In the open trials, English pointers and setters made her look slow on the back course and while her excellent nose made her second to nothing else in the bird field, it wasn't enough to win the trials. Field trial crowds, and judges, like flashy, wide-ranging dogs not slow and thorough meat hounds. I quit entering her in trials. I just shot pheasants, woodcock, and ducks with her.

In Morris County marshes, where I used to do a lot of duck hunting, Clementine was forever finding and retrieving crippled ducks that other hunters had been unable to find. One morning, along Black Brook in Florham Park, then open hunting ground, Clementine “limited out” on black ducks and mallards. She found and brought me whatever the limit was, five as I recall, and I never fired a shot. She was my darling Clementine.

During the eight years that she lived I never lost a crippled bird. If I wing-tipped a pheasant, Clementine would trail it and bring it back. All I had to do was stay and wait.

But the shorthairs of her day were too slow for many who wanted to run them in open trials so they started to “improve the breed.” Over the years shorthairs have become faster and faster.

I own one today which covers the fields like a rocket, but I seldom hunt with her. Whenever I take her out I spend most of the day wondering where she is and trying to find her.

Field trial type shorthairs are quite common today and if you hunt open country on a fast horse they are fine. If you plan on buying a shorthaired pointer puppy and if you hunt on foot, as most of us do, make sure the puppy comes from proven hunting stock. The safest bet today, and here I am leaving myself open to rocks, may be the Brittany spaniel. Not enough people have gotten around to “improving” this breed yet.

My best dog today is a five-year-old Brittany bitch, Donna, and she is excellent on woodcock, pheasants, quail and grouse. She hunts industriously and points for as long as the bird, or rabbit, sits tight.

I didn't want her as a puppy but the breeder, an old friend, insisted on giving her to me. I was training shorthairs at that time and simply took the puppy along to give it exercise.

The fact is I never spent five minutes training that Brittany; she trained herself. At five months she started finding (and pointing) pheasants and quail that the other dogs had overlooked. I started relying on her more with each passing day. By the way, she is not for sale at any price.

However, I know that not all Brittanies turn out as well as this one did. I consider mine as highly intelligent with excellent “bird brains,” but she is only the first of the breed that I have owned.

I am not trying to sell Brittanies or any other breed since I know that there are good and bad in all of them.

Pick a dog from a breed that suits you and give it plenty of time to develop. Whether you keep the dog in the house or in a kennel, make sure you spend enough time with it. Treat it with kindness and take it hunting often. A new dog will make mistakes and so will you, but the chances are bright that it will turn out to be a good hunting dog.

Maybe another Donna or even a Clementine.



Donna, Brittany spaniel, with five woodcock bagged in 1972 in Monmouth County.

FISH AND GAME IS ALSO NONGAME

By Teddy Schubert

New Jersey now has a comprehensive Nongame, Endangered and Wildlife Species Project initiated by the Division of Fish, Game and Shellfisheries to fulfill the State's obligations and responsibilities to all the wildlife species. A bill introduced by Assemblywoman Josephine Margetts, A-2151, "The Endangered and Nongame Species Conservation Act", provided an appropriation of \$100,000 for research, inventory, and management of the state's nongame and endangered species.

The New Jersey Division of Fish, Game and Shellfisheries is legally responsible for all the wildlife of the state. Since the Division's inception in 1892 when most all the State's wildlife was in relative abundance, millions of dollars have been spent on law enforcement, upland and wetland development, land acquisition and public relations aimed at nongame as well as game species. All wildlife benefitted and still benefits from this management, including the non-hunted species. Wildlife is a renewable resource and as such responds to management efforts despite the ever-growing threat of encroachment by housing developments, highways and land clearing.

In recent years, however, through the loss of particular habitats and increasing pollution and human populations,

some of New Jersey's rarer and more demanding wildlife species have dwindled to such low numbers that their actual chance of survival in New Jersey is threatened. One such creature is the Bog Turtle, a small cool-water swamp dwelling reptile whose habitat has been severely decimated and whose numbers have also been depleted by collectors seeking the now valuable animals. Bog Turtles still exist in New Jersey and are found in a few other states in limited numbers, but without increased protection and management, this unique turtle may be gone from New Jersey forever.

The plight of the Bald Eagle and the Osprey are more generally known due to national press coverage of these large predatory birds. Both have suffered from the pollution of our streams, rivers and bays where they feed upon fish containing small amounts of dangerous heavy metals. These substances and others such as DDT and DDE concentrate in the bird's body and affect certain functions of its reproductive cycle. Sometimes abnormal behavior results and no nesting occurs, sometimes egg shells are thinned in a distorted chemical process within the bird and the eggs are easily broken. Only a few young are raised every year in clean, pollution-free areas and these few



Governor William T. Cahill signs the Endangered and Nongame Species Conservation Act. In attendance, left to right, Assemblywoman Josephine Margetts, Assemblyman Arthur A. Manner, Division of Fish, Game and Shellfisheries Director Russell A. Cookingham and Department of Environmental Protection Commissioner Richard J. Sullivan.

cannot hold up the population numbers while other nesting attempts fail year after year. New Jersey has lost many nesting pairs of osprey and many more unhatched eggs.

Man's disturbance will often cause Bald Eagles, our National symbol, to leave its nest site or fail to return to its nest in future years. Bald Eagles haven't nested in numbers in New Jersey for many years.

These and other creatures can be helped, and the Non-game and Endangered Wildlife Species Project of the New Jersey Division of Fish, Game and Shellfisheries is aimed at doing just that. The sportsmen's dollars have for years supported wildlife management and special money is now available to concentrate on our troubled wildlife.

The project will consist of essentially six major work areas. A check list and survey of the nongame species, their distribution, management needs and recommendations for legislation and regulations will be one of the initial work areas. Secondly and more importantly, the endangered species will receive attention concerning their life history, distribution, management needs and also legislation and regulations.

Exotic species of wildlife, those not native to New Jersey but which are being brought in from other states and countries, will be regulated through a permit system and increased enforcement of state and federal laws. These species can threaten native species through the introduction of diseases for which our wildlife has no natural resistance. Exotic species usually escape from captivity and compete with native species for habitats.

For every squirrel monkey alive in a pet shop, many others have died in capture, transport and holding areas. New Jersey is presently one of the largest entryways for exotic species, and all too many of these are illegally imported. Products of endangered exotic species are often found amongst other cargo at New Jersey ports. In the light of national concern over all species of wildlife, New Jersey is striving to end illegal shipments of exotic and endangered species coming into and through the state.

A public information and education system will serve to keep the public aware of developments in New Jersey's dynamic nongame and endangered species project. It is felt that all citizens have a share in the wildlife resources



Peregrine Falcon

Debra Ruggiero

of this state and therefore media announcements of the progress, findings and conclusions of this project will be issued.

Land acquisition is a basic approach to solving some of the problems of managing wildlife species and is perhaps one of the most vital. Areas of unique character which support rare or endangered species will be sought for acquisition. A percentage of the funding for land acquisition may hopefully come from federal aid assistance in the form of matching money.

The Division anticipates working closely with individuals, groups, organizations and agencies in the investigation of wildlife numbers, habitats, management needs and enforcement problems and the Division sincerely hopes all who are interested will actively participate.

Energy Shortages Notwithstanding — Can the People of New Jersey Afford These Losses?

In most debates on the environmental safety of nuclear power plants, the pro-con factions usually stick with the big unknown issues and major long-term possibilities—eg. possibility of explosion, hazards of radiation leaks, effects of thermal cooling shutdown, etc. While these kinds of considerations certainly rate prominence on anyone's list of priorities, the less-noticed drawbacks of *current* nuclear capabilities too often go unnoticed.

For instance, a recent draft environmental statement regarding the issuance of "a full-term operating license to the Jersey Central Power and Light Company for continuing operation of the Oyster Creek Nuclear Generating Station, located 10 miles south of Toms River, N.J.," included these not-quite-cataclysmic, but known, effects:

—*Periodic kills of fish;*

—*Change of the typically estuarine streams to ones of constant bay salinity throughout the intake-discharge canal. This has eliminated spawning and nursery areas used by many marine organisms, and has caused the introduction of boring marine organisms;*

—*Erosion of the banks of the intake-discharge canal has caused excessive silting and sedimentation;*

—*The discharged heat may reduce the production of fish by about 5000 lb. annually and cause a significant loss of winter flounder and zooplankton;*

—*Impingement on intake screens results in the significant annual loss of 32,000 blue crabs and 24,000 winter flounder, in an area heavily used for sport fishing;*

—*Annually about 150 tons of zooplankton, 100 million fish larvae, and 150 million fish eggs are lost by passage through the station's condensers;*

—*About 80 acres of freshwater marshland and 45 acres of saltwater marshland were lost. The saltmarsh represents a loss of 48 tons/yr. of primary productivity to an ecosystem utilized by about 75 species of fish;*

—*About 350 acres of pine barrens were disturbed by construction activities and converted to station use. About 290 acres of spoils and cleared areas on the site will remain denuded for many years;*

—*About 75 acres of cedar swamp forest, a unique biological habitat, were lost along the transmission line right-of-way.*

CONSERVATION NEWS
National Wildlife Federation

The Atlantic Brant in New Jersey

by Joseph M. Penkala
*Graduate Wildlife Program
Rutgers University*

Get down! Here they come! Against a leaden-gray sky, a wavy black line of birds beat their way in our general direction. The tide had dropped considerably since we had groped through the early morning darkness setting out decoys and hiding our boat.

A quickening breeze brought the blocks to life. As the birds drew nearer, one of the flocks, numbering about forty, spotted our decoys and let out a metallic "erronk." We quickly responded with our best imitation. That was all the birds needed. They zeroed in on our decoys and began to lose altitude. The entire flock was now calling. The birds turned into the wind, cupped their wings, and lowered the landing gear. At this point, they looked about ten times bigger than any bird has the right to look. But they were not yet within range. After what seemed like an eternity, they were over the decoys.

Now! The numbness mysteriously disappeared from my fingers. I sprang to my feet. My double cracked twice. One bird folded and hit the water with a great splash. My partner sent one bird spinning to the sand bar in front of us. Another bird faltered and then folded, hitting the salt marsh behind us. The remainder of the flock back-pedalled, fought to gain altitude and was quickly out of range. In an effort to restore the circulation to my toes, I volunteered to retrieve the dead birds. I returned to the blind with three sleek Atlantic Brant. It was a good day. The birds kept flying and within a few hours, we had filled our two-man limit of twelve brant.



*Looking like a camouflaged soldier,
the author waits . . .*



Two at 12 o'clock!!!



photographs
by
Harry Grosch

Setting out the decoys.



On a cold grey morning, the hunters are crouched in the tall marsh grasses waiting for the decoys to attract some waterfowl.

This scene has been an important part of waterfowl hunting in New Jersey for many years. The Atlantic Brant is a favorite of the New Jersey coastal gunner. It is a large bird which decoys well and in years when the population is up, brant provide some of the best waterfowl gunning to be found anywhere. During the past season, and again this year brant hunting has been only a memory. The season has been closed and brant decoys have been tucked away for better days.

Last season there were considerably fewer birds than usual along the Jersey coast. What happened to the brant? To get some answers, we have to go back to the winter of '71-'72. This was the first time

that there was any indication that something might be wrong with the brant population. Few juveniles had come back during the 1971-1972 waterfowl season. Despite the lack of young birds, it had been a good season. There were plenty of adults and New Jersey gunners took a good harvest.

During January and February, Fred Ferrigno, Senior Wildlife Biologist in charge of Wetlands Research, began to notice a distinct absence of brant in their favorite winter haunts. At the Atlantic Flyway Council Technical Section meeting in early March, Fred arranged for all the states in the Atlantic Flyway to make a special brant census flight. By late

March the bad news was in. Only 24,700 birds could be found; less than half of the 73,100 which had been counted during the last waterfowl census in early January. This was a drastic decrease in numbers.

One explanation was that the birds had already begun to migrate and were not in the area censused. The 2,300 birds found in Main and New Brunswick seemed to substantiate this theory. But migration alone could not explain such a large drop in the population. The biologists were concerned, to a degree, but if the brant had a good breeding season that summer, the population would be up for the next hunting season. After all, the birds had had a poor breeding year during the summer of



Adult brant on left and juvenile brant with identifying white stripes on wings.

1971, so they were due for a good one in the summer of 1972. Brant do not normally have two bad breeding seasons in a row. Then in July, distressing news came from the Canadian biologists. The Arctic nesting birds of which the brant is one, had another "bust" breeding year.

The Brant nests north of the Arctic circle in eastern Canada where the summer temperatures rarely get above 50°F. When the brant arrived at the Arctic nesting sites in early June, there is usually still ice and snow on the ground. The birds must wait for the ice and snow to clear before they can build their nests. They must also nest within 14 days of their arrival. If they do not nest within this time period, the young of the year would not be old enough to fly south by early September when the snow and ice returns. If the adult birds do not find an adequate nesting site during this 14-day period, they will not nest at all for that year.

During the spring/summer of 1972, snow and ice gripped the breeding grounds late into June and the brant, for all practical purposes, did not breed.

At the August meeting of the Atlantic Flyway Council, where waterfowl regulations are recommended on the basis of

the reports from the Canadian and United States biologists, the decision was made to drastically reduce hunting during the 1972-1973 season. Finally, it was decided to close the season entirely when all information from Canada was analyzed. The waterfowl census flight in late October, 1972 confirmed the prediction. Only 40,000 Atlantic Brant could be found throughout the fly-way. This was the lowest brant population in the 25 years during which aerial censuses had been flown.

During March of 1972, the Division of Fish, Game and Shellfisheries contacted the Rutgers Wildlife Department about undertaking a research project on the Atlantic Brant. The project was to be a cooperative effort between the division and Rutgers. In this way, we could bring as much expertise as possible to bear on the Atlantic Brant problem.

My portion of the project was to include food habits and population dynamics. We were interested in food habits for two reasons: (1) The abundance of food or lack of it can greatly affect the number of brant New Jersey can support in good condition through the winter (The Garden State normally winters between 70% and 90% of the entire brant population.)

and (2) A lack of food can cause the birds to move more often which makes them more susceptible to gunning pressure.

Knowing what the birds eat and how much they eat is important. To get food habits information, we collected a few birds during each month of the fall and winter. The entire digestive tract is removed from each bird and all of the food present is taken out. It is identified according to the kind of food and amount present. This data will be correlated with abundance surveys of various brant foods, now being carried out along with the Jersey coast by Division personnel. The Division is also exploring the possibility of using satellite photos to monitor the abundance of brant food plants.

In doing a study of population dynamics of the brant, we attempt to predict how many young birds will be produced in a given year, how long they will survive, and what causes them to die. This information is gathered in several ways. Aerial waterfowl censuses and ground counts of total number of brant, number of adults and number of juveniles present is one method. These surveys have been conducted by Division personnel for many years.

My portion of this study involves the statistical analysis of the census data and the band-return data. We are also experimenting with computer-generated maps to display the census data.

I am presently developing a technique where-by we can identify second-year immature birds. This is important because brant do not breed until their third summer. If we can identify second-year birds, we could get a more accurate estimate of the number of young per adult of breeding age.

We are also keeping tabs on brant body weight. We are looking for weight changes that may reflect a lack of food on the wintering grounds. Also, Division personnel have been working on a technique for live-capturing brant on the wintering grounds so that they may be banded.

The brant research may seem like a large project, but it is only one of several such projects being carried out under the Wetlands Research Program by the Division of Fish, Game, and Shellfisheries. It is a good example of the knowledge that can be obtained under cooperative projects by various state agencies; in this case, Rutgers and the Division of Fish, Game, and Shellfisheries.

Large amounts of management information will have been collected concerning the Atlantic Brant when this project is finished. It is hoped that this data will enable us to predict future declines in brant numbers and possibly avert them through good management practices.

Art and Photo Credits

Front Cover

Ice formations on a New Jersey marsh
Harry Grosch

Inside Front Cover

Harry Grosch
Nikon F2, Ektachrome X

Inside Back Cover—Barred Owl

Illustration by Debra Ruggiero

Back Cover

National Wildlife Federation

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Courtesy of Playboy Club

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Pages 30-31

Harry Grosch
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Layout and design
by Stan Kephart

OUTDOOR BRIEFS

Deer Facts

The Bureau of Wildlife Management of the New Jersey Division of Fish, Game and Shellfisheries reported that the 1973 firearm buck season produced another excellent harvest with 6,798 deer checked at the mandatory checking stations. This compares favorably with the 1972 record harvest of 6,961.

Special Permit Deer Season produced a harvest of 2,782 deer of either sex. And earlier in the year, bow hunters took 1,689 deer.

With the 1973 archery and firearm seasons now history, the total harvest of 11,269 is a continuing indication of the success of the division's deer management program in the nation's most densely populated state. This is the second highest number of deer harvested in New Jersey hunting history.

Wildlife Management Guide

The revised and expanded edition of the "Guide to Wildlife Management Areas" has been well received by the New Jersey sportsman. The new guide, comprising over 100 pages of articles and maps in three colors, is priced at \$3 per copy.

Descriptions of the 50 wildlife management areas include locations, hunting and fishing information, as well as data on parking, camping and access roads. The maps illustrate the boundaries, wooded areas, fields, lakes, streams and marshlands. Also depicted are the roads and highways leading into each management area. The guides may be purchased by sending a check or money order to: Wildlife Management Guide, Division of Fish, Game and Shellfisheries, P.O. Box 1809, Trenton, N.J. 08625.

Hunter Safety Program

The student load has almost doubled as a result of legislation effective January 1, 1972 mandating hunter safety training for anyone securing their initial license regardless of age.

The number of students completing the firearm hunter safety course in 1972 was 17,295 and the bow safety course was 5,038. The 1973 totals, when compiled, will show a continuing upward trend. A total number of 452 firearms safety instructors and 190 bow safety instructors currently serve on a voluntary basis. Each county will have one instructor serving as the county firearms coordinator and a bow and arrow safety instructor serving as the county bow and arrow safety coordinator. Instructor groups are being formed within the counties to work through the county coordinators. The groups will consist of a minimum of five instructors with one designated as the group captain.

Centralized training sites are being established in all 21 counties. Utilization of wildlife management areas as training sites is being given first consideration.

ICE FISHING

some changes in regulations

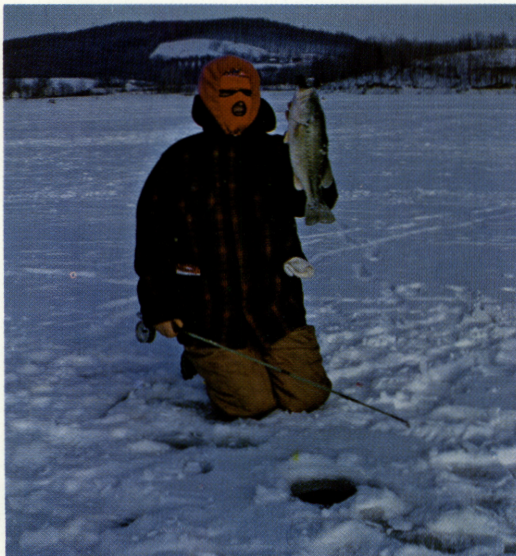
Walter S. Murawski, *Senior Fisheries Biologist*

This winter for the first time New Jersey anglers can plan on a full two month ice fishing season. This will run from January 1st to February 28th. This change in the Fish and Game Code was adopted by the Fish and Game Council in order to provide for the maximum amount of recreation to the winter-weary angler.

In the recent past, the season ran only to the middle of February but because of the series of mild winters that we've had in the last decade the seasons were given last minute emergency extensions in four of the last nine years.

Next winter (1974-75) the season will be lengthened even further with the ice fishing season opening on December 1st, 1974 and extending to the end of February 1975. If we have a cold winter, ice fishermen will be able to enjoy their sport during the Holiday Season, something they have not been able to do since 1900 when ice fishing was eliminated for the following three years. After that time ice fishing was restricted to the month of January up until 1963.

As we all know, the prime target for the ice fisherman is the Eastern chain pickerel. Incidentally this same species is called "pike" by our South Jersey kin. The question arises when the extended fishing season is considered as to whether or not this species can withstand the increased angling pressure and "bounce back" year after year. This same concern was felt as early as the mid 1880's when the New Jersey Fish Commissioners in their Report for 1884-1885 noted that the pickerel was "a favorite native fish in the state and complaint is made that the species is becoming extinct." This was partly attributed to the introduction of bass, which had become widespread throughout the state, but the report continues, "... it is an assured fact that in the absence of restrictions upon pickerel fishing almost any body of water may be depopulated by the method now pursued by anglers and hunters. With the growth of any community the pick-



Warm clothing is a necessity for this type of fishing. Results can be varied as shown by this largemouth bass which fell for a tip-up minnow.

photographs
by Harry Grosch



Chain pickerel are the most common species taken by tip-ups through the ice. Strings like this are common on many northern lakes.

erel will surely decrease, as the habits of this fish make him easy prey of any ten-year old boy who can procure a boat, paddle and piece of wire . . .”.

The fears of our forebearers seem to have been quite unfounded as the pickerel has withstood the onslaught of anglers over the years.

Evidence obtained on the ice fishery of a number of our north Jersey lakes during the 1950's and 1960's have shown us that there have been sharp variations from year to year in the success rate (catch per fishing line) of the anglers and that these variations are due not only to the presence of or lack of strong year classes of pickerel but also to the total amount of fishing pressure. We have noted that when a large population of catchable fish is present in a given lake at the beginning of a season the word will spread amongst the anglers and the fishing pressure will increase to such a point that the catch rate will begin to drop off. This may take one or more seasons depending on the size of the pickerel population, but will eventually happen. At that point anglers will lose interest in that particular lake and will transfer their activity somewhere else. This process acts somewhat like a safety valve as we have never found any evidence that a pickerel population, either with or without a size limit, has been permanently reduced by overfishing.

Nonetheless, as an extra-precautionary measure, in conjunction with the planned extension of the ice fishing season, we have also reduced the creel limit of pickerel down from ten per day to five per day beginning with the 1974 season.

So you can start planning your ice fishing trips right now keeping in mind that you'll be able to continue fishing through the ice right to the end of February but that you'll be able to keep only five pickerel rather than ten as in past years. Good Fishing!



Another favorite target of the frost-bite clan is the yellow perch. Fish can be caught by tip-ups or jigging as shown here.

from the director

With this issue of *New Jersey Outdoors* we introduce a "new look" in our state publication, and the publishing change from monthly to bi-monthly.

This "new look" will include a larger size, allowing for more material and a greater variety in content. In addition, the change to bi-monthly will permit the use of color, adding to the presentation of the articles and the publication itself.

Along with a new magazine, we have also revised the staff, with Mr. Steve Perrone assuming the editorship. With Mr. Perrone's background in publications we're sure *New Jersey Outdoors* will become a publication worthy of the division and on par with other outstanding state publications.

We have had some publication problems in the past and we thank those subscribers who have stuck with us and hope this new publication will justify your faith in us.

Please feel free to contact us regarding our new endeavor, whether pro or con, since your constructive comments will result in a better magazine for all concerned.

Good reading and best wishes for the new year.



Division of Fish, Game and Shellfisheries

Russell A. Cookingham

New Jersey OUTDOORS

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