IOWA CONSERVATIONIST

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WEATHER AND WATERFOWL MIGRATION

Crowds Up Funds Lag

Iowa Parks Face Crisis

Ray Mitchell
Superintendent of Parks

State parks have been defined as relatively spacious areas of outstanding scenic or wilderness character. They often contain significant historical, archeological, ecological, geological and other scientific values, preserved as nearly as possible in their original or natural condition and provide opportunity for appropriate types of recreation where it will not destroy or impair the features and values to be preserved.

State parks mean various things to many people. To a family it may be a gay place to picnic in pleasant surroundings. To the weary businessman it may offer a needed rest from the ever turning wheels of progress. To the scientist it is an undisturbed laboratory from the past, to the adventurer a satisfying experience and to all who come, a sort of unexplainable uplifting of the physical and spiritual being.

Preservation of the States' natural, scientific, and historical areas is of intangible but unquestionable value to the culture and well being of her people. Such values are as important as the water and soil upon which civilization thrives.

State park systems or related

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IN THIS ISSUE

Jim Sherman Photo.

Iowa waterfowlers this fall will be guided by regulations that are essentially the same as those of last year. The 70-day season opens October 4 and continues through December 12. Whether you call them by their common name, or "spikes" or "sprigs," these pintails make for fine sport and a mighty pretty picture.

Iowa Duck Season Is Set

A 70-day duck season, beginning October 4 and continuing through December 12, has been announced by the State Conservation Commission.

The new regulations are much the same as a year ago, except for season dates. As in 1957, Iowans will hunt until sunset each day in lieu of including wood ducks in the bag.

During the 1958 season, hunting will be from one-half hour before sunrise to sunset, including opening day. Daily bag limit of ducks is four (4). Only one (1) hooded merganser may be in possession at any time. Not more than two (2) canvasbacks or two (2) redheads or one (1) canvasback and one (1) redhead may be included in the daily bag limit. Possession limit of ducks after the first day is eight

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Paul Becker
Meteorologist
U. S. Weather Bureau
Dubuque

Migration of birds has long been a source of wonder. Even the artists among the cave dwellers depicted migratory birds in their cave wall murals, indicating, at least, an awareness of avian travels. Today's waterfowl hunter knows that the flights or "pushes" take place in advance of or during foul weather for the most part.

Migrating birds pick days of rugged weather rather than the balmy days of autumn not only because of being driven from the north country by the cold and snow but because the weather pattern also brings them tail winds to aid their southward flight to the wintering grounds.

Of course, one doesn't have to be a meteorologist to know that when the first snow flies and the ice forms in the north country it's time to head for the blind; and by the same token it isn't any mysterious instinct that tells the birds to get out or suffer the rigors of an iced-in, snow-covered habitat.

What the meteorologist does understand, and what the ducks seemingly sense too, is that there are times when it turns cold and snowy in the north country but the long fetch of tail winds to help on the long flight south is not present. Consequently the ducks remain or move but a few miles south, and the mass migration is deferred until these extensive northerly winds do come. So you can see that cold and snow alone do not make a mass flight. A great many wildfowlers cannot take the time to be out every seemingly good "duck day" and it is to be hoped that the following discussion will do much to take the guesswork out of putting the "fix" on flight days.

Every hunter can avail himself of the professional facilities of the principal source of weather information, the U. S. Weather Bureau. The steady stream of forecasts and charts released by the Weather Bureau through the media of newspapers, television and radio vary both in detail and the extent of the

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GOOSE CALLING CONTEST IS SET

Program of events for the 1958 World's Championship Goose Calling Contest at Missouri Valley, September 27 and 28, has been announced by contest officials.

The annual parade at 2 p.m., Saturday, September 27, will officially kick-off the contest to select a National Champion Goose Caller on Sunday. Jack Ray of Hope, Arkansas, is the defending champion.

Grandstand events this year will include Joe Bodrie in an exhibition of all kinds of pistol shooting; the High Brothers, a trampoline act; the Air Force Drill team from Offut Air Force Base; champion trapshooters, and a German short hair retriever demonstration.

Admission to the parade and grandstand events is free.

Top prizes for the three top goose callers will be a $1,000 savings bond; 10-horse outboard motor; and a 12-gauge Magnum shotgun. Other prizes will include a week's vacation for two at Okoboji, fishing rods and reels. Ten prizes in all will be awarded.

Information concerning the program or entry procedure may be obtained by contacting Harold Alger, publicity director, World's Championship Goose Calling Contest Inc., Missouri Valley, Iowa.

TRAPPING DATES

Under a sub-heading "Mink-Muskrat in the 1958 trapping regulations in some issues of the August CONSERVATIONIST, the following statement appears: "Remainder of the state is open for trapping of mink and muskrat from 12 o'clock noon, November 20, 1958, to midnight, March 1, 1959. These dates are incorrect. The statement should have read: "Remainder of the state is open for trapping of mink and muskrat from 12 o'clock noon, November 20, 1958, to midnight, December 15, 1958."

Editorially Speaking

Lester F. Faber
Assistant Director

Farmer-Sportsmen Relations

A new fall hunting season is just beginning. Over a period of the next few months over 350,000 Iowans will take to the field in search of wild game.

Most of the hunting will be done on privately-owned farm land. This large number of hunters will be the guests of some 200,000 farmers for 2,000,000 hunting trips. The word guest can be used here because, in Iowa, most farmers do allow hunting on their lands and most hunters, except for the minority of troublemakers, behave as proper guests should.

Several factors about Iowa's hunters and fishermen tend toward keeping farmer-sportsmen relations on good terms and, incidentally, makes Iowa a good place to work as a professional conservationist.

Iowa has no large metropolitan areas. Most Iowans in cities and towns are not far removed from the farm. Driving distances are such that most hunters are able to become well acquainted with landowners. The interest in hunting and fishing is about the same among city people and farm folk alike. Surveys have shown that 30 per cent of the city people, 37 per cent in small towns and 30 per cent of the farmers hunt and fish. This similarity in interest results in better understanding and mutual interest.

Driving distance to hunt indicates local interest. Sixty-two per cent of Iowa hunters drive less than 250 miles to hunt each year. Actually, 51 per cent of the hunters drove less than 100 miles. This would indicate that most hunting is done close to home. The town hunter would be able to "know" a farmer friend and be welcome. This short distance is also an indication of the number of farmers who hunt.

We have a "way of life" in Iowa of similar interest in hunting by the farmer and townsmen alike that makes for better understanding. We have good farmer-sportsmen relations that must be cherished and can be maintained by thoughtfulness and mutual respect.

Nature's Notebook

OCTOBER EVENTS

. . . Main migration of ducks and geese, including the migration of "big" ducks—mallards, pintails, canvasbacks—takes place in October.

. . . Coots migrate at night during October.

. . . Robins and bluebirds migrate this month. Huge flocks of blackbirds may also be observed.

. . . Heavy night migrations of thrushes, tanagers, black-bellied and Golden plovers during October.

. . . Rails will be migrating this month.

. . . Tree and shrub foliage reaches peak of color in October.

. . . Last of fall flowers and fall fruits may be observed in October. Fall fruit includes wild grapes, wild crabapple, etc.

. . . Wild animals scurry to complete hibernation in October, including ground squirrels, ground hogs, beaver and muskrats.

. . . Turtles and frogs begin hibernation in October.

. . . Last of the late hatching insects appear in October. Migrations of Monarch butterflies and dragonflies takes place this month.

. . . Native nuts will be in evidence in Iowa's forests and woodlots in October, including butternut, hickory, walnuts and hazel nuts.

Wardens Tales

Bruce Parker, the Chickasaw County Conservation Officer, was assigned to the animal exhibit outside the main exhibit building during the recent Iowa State Fair.

It was one of the cool, damp days during the fair's run, and the beaver were huddled together in their cage for mutual warmth. They were tightly wound in one large furry ball, and only a couple of broad, flat tails stuck out from under the brown mass of fur. The rolled and heaped-up beaver were warm, comfortable and snoozing contentedly.

Touring the exhibit grounds to answer questions about the animals on display, Parker paused to watch the beaver. Apparently, at least one observer mistook the beaver protruding tails for something else, for Parker heard one woman exclaim to another:

"Well it looks like they (conservation employees) could get a rubber mat big enough so that those beavers wouldn't have to try to huddle up on that little tiny thing!"

It's well known that you don't get something for nothing in this world and no one knows it better than Conservation Officer Christie Hein and a farmer out in his Mills County territory.

A couple of years ago there was a lot of grasshopper spraying being done in Hein's territory. Because of the size of the menace, some of the spray was offered without charge to farmers with grasshopper trouble.

Hein met and visited with a farmer one day while the treatment was going full blast.

"Went to town and got some of that 'hopper poison. I heard about the free stuff and got some of that too," the farmer told Hein.

About ten days later, Hein met the farmer and asked him about the success of his poisoning project.

"Man, I sure killed the 'hoppers with that free poison. I mixed it double strength," he said.

"Did you notice any dead birds?" Hein asked.

"No birds," the farmer countered, "but you know I counted 11 dead skunks around the field. Would the poison kill skunks?"

"It's possible," Hein answered, "skunks eat a lot of grasshoppers."

The farmer was silent for a moment. Suddenly he grasped his head in both hands.

"My gosh! Do you suppose that's what happened to my pigs? I lost 14 pigs in the same field," the farmer gasped.

The milk snake is named for the erroneous belief that it milks cows. Though it frequents barns, it is attracted by mice, not cows.

George Tovey Photo.

The mourning dove in this photo may look docile enough, but he is a game bird with erratic flight to test the skill of any marksman. Iowans do not hunt them, but help pay their way for sportsmen in the 29 states that have dove seasons.

WHY HUNT MOURNING DOVES?

Martin L. Grant
Professor of Biology
Iowa State Teachers College

The mourning dove in Iowa is in danger—great danger. Or is it? In any case, the State Conservation Commission is considering the declaration of an open hunting season for the taking of these birds.

A great many reasons have been given for this move: (1) it would furnish sport for a great many hunters, (2) it would provide meat for food, (3) since all the states south of Iowa allow dove shooting, we can too, (4) the dove isn't of much importance anyway.

Those opposed to the shooting of doves answer this way: (1) do you call this "sport," shooting such a "tame" bird? (2) just how much meat would you secure from one dove? (3) there are other things done in the states south of us, for example, in Little Rock, Arkansas, that we don't necessarily recommend for Iowa, (4) robins, redbirds and redstarts aren't important either, so let's open the season on them.

The above arguments, for and against, do not impress me one way or the other. They either don't amount to much to begin with, or else they cancel each other out. There is another line of reasoning, however, that can not logically be met, and that involves the sentimental value.

By tradition there has developed a large amount of anthropomorphic projection and symbolism with reference to doves in general. The dove stands for Peace, for Purity, and for Innocence. In the sense of being unaggressive, it is about as harmless a creature as can be found. It does not bother other birds, and has no habits that seriously disturb people—if you can stand their sad cooing in the early morning. If any wild thing seems to deserve being left alone in peace, this bird does. This argument I can follow and agree with. For purely sentimental reasons, then, let's protect the mourning dove. How many will go along with me on that?

But, wait—let's see what this leads to. Personally, I am not interested in shooting mourning doves. I like mourning doves. I feel that they are my friends. Why should I hurt them? But, neither am I interested in shooting rabbits, or pheasants, or anything else, for that matter. I just don't happen to be interested in hunting. I am very glad that this is a free country, of sorts, so that no one can force me to hunt. And so, not being a hunter, I am opposed to opening the season on mourning doves. And also, being consistent, I would ask for a closed season on all other kinds of game: rabbits, pheasants, squirrels, mallards, etc. How many of you are still with me?

Dr. Albert Schweitzer, whom I strongly admire, has a central theme in his philosophy that is pertinent here. He calls it "reverence for life." And so he tries to avoid killing all animals, even poisonous snakes. He has even confessed that he hesitates to use penicillin on people because it kills living bacteria. He does, however, go ahead and use it.

Many people, because of a sentimental feeling for other animals, which I can share, have become vegetarians, and refuse to eat meat. It becomes hard to be consistent. If we are to refuse meat, how about fish? eggs? butter? milk? And what about plants? As a teacher of botany, I am ready to insist that plants are just as much alive as are animals, though some animals seem to be more "alive" than any plants.

Real "reverence for life," then, could (should?) lead to a complete refusal to profit by the death of any kind of organism, plant or animal. This position, though, is obviously purely theoretical, and I know of no one who takes it. If anyone did, with nothing left to eat, he wouldn't last long. This kind of complete pacifism, a refusal to allow the killing of anything, obviously doesn't get us anywhere. And that is where a refusal, on sentimental grounds, to consider opening the season on doves, leaves me. I've taken the stand, though, and so I'm stuck with the position. *You* don't have to stay with me, however, as I can find you a way out.

"Reverence for life" is not the only principle in my personal philosophy. Another one is the principle of human freedom. In general, I approve of anything which makes people more free. As far as I'm concerned, you may do anything you wish, just so you do not interfere with the freedom of other people, including yourself. If you should interfere too much with someone else's freedom, a kindly policeman might help you desist. Often it becomes a matter of balancing the loss of one freedom against the gain of larger freedoms. For example, I am willing to remain on the right side of the road, and will give up the freedom to drive on the left, because the result is that I now have a complete right-of-way on the right, and don't have to worry about drivers going the other way (I hope!). Thus, the total result is a gain in freedom.

I have been counting doves at various times and places in Iowa for a period of over 20 years. Without paying any more attention to them than to other kinds of birds, my records show that I have found several thousand mourning doves. In this situation I am sure that there are enough to go around. The state is large enough such that I, not wishing to hunt doves, can live side-by-side with you, who may wish to do so. After you may have killed some, I am sure there'll be some left over for me to enjoy.

So, you go your way, and I'll go mine. I probably shall not hunt doves, regardless of what happens, but I am not interested in forcing my pattern of behavior on you. I am sure I have many other prejudices that you would not like to be forced to follow. I'll let you alone, and hope you'll do the same to me. If some Iowans want to hunt doves, let them go ahead. I will not try to stop them!

Very seriously, much of the most serious trouble in this world is due to one group of people trying to force its beliefs on some other group. In a great many cases there is no particular reason for preferring one belief against another. If individuals, families, societies, and countries could see this, all of us would be saved an enormous amount of trouble. So you go ahead and shoot your doves, and I'll let mine alone.

I am not worried about the extirpation of the mourning dove due to shooting. It is true that some birds and other animals have been exterminated or seriously reduced in numbers, and it seems that three main factors are usually involved: (1) lack of knowledge concerning the bird's habits and preferences, (2) lack of adaptability of the bird to an environment being changed by man, and (3) lack of application of principles of game management (perhaps in ignorance, before the subject had been studied), due to disinterest.

With reference to the first of these, the mourning dove is a much-studied and fairly well understood bird. Careful studies of food preferences, nesting habits, and migration, many of which have been done under the auspices of Iowa State College, make it possible to forecast the effects of possible environmental changes, such as opening a hunting season.

Second, the bird thrives in areas which have been disturbed by man. It seems to prefer a man-modified environment. I found a dove's nest once at a busy intersection on a platform above the street formed by the crossing of two pairs of trolley wires. Personally, I didn't think this particular pair of doves was very bright in their choice of a nesting site, but they gave me the laugh by succeeding in raising two young, in spite of the tremendous shaking the nest received every time a street car went by. Most birds which have been greatly reduced in numbers by man have been those which have been unable to accommodate themselves to human disturbance in the environment, e.g., the passenger pigeon, ivory-billed woodpecker, whooping crane, trumpeter swan, Carolina paroquet, etc.

Third, many of the almost or quite extinct birds received their serious reductions in numbers before any attempts at all were made to manage them in terms of game production. Management of the white-tailed deer, the pheasant, the wood duck, other waterfowl, etc., have shown that by, first, habitat improvement, and, second, control of the shooting season and bag limits, it is possible to harvest large numbers as game, and, at the same time, secure an increase in the total population.

If a dove season should be opened in Iowa, I am sure no person or agency would watch more closely to see what was happening than would the State Conservation Commission, and, at the least alarming sign of reduction in numbers, the season or bag limits or both would be reduced. This reduction would be with the consent of the sportsmen in the state, since they, most of all, are least interested in ruining their recreation possibilities by the loss of

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Deer Hunting: Robin Hood Fashion

Arnold O. Haugen, Leader
Iowa Cooperative Wildlife Research Unit
Iowa State College

A quarter of a million archery deer hunters can't be wrong! When that number of American sportsmen have adopted the bow and arrow as their hunting weapon, the sport must have real attraction. Here is a national sport that has grown from participation by less than a hundred hunters to a quarter million bowhunters all in a period of 25 years.

Modern day bowhunting got its first major boost in Wisconsin where the nation's first special season was provided in 1934, and in Oregon where the first exclusive bow and arrow deer hunting area was provided in 1935. By 1957, almost all the states provided a special deer season and/or a separate area for bowhunting. Iowans have enjoyed a separate bow and arrow deer season since 1954. The year before that, archers and gun hunters hunted together during a common season, the first deer season in Iowa in modern times.

There are two good reasons why separate seasons are desirable for archery deer hunting: First, because deer that are constantly disturbed as they are in the gun season become a little too wild and alert for such successful stalking; secondly, because stalking is not a very safe method for hunting deer while the gun season is in progress. The bow and arrow deer hunting season this year extends from November 1 to November 30, inclusive.

The fact that nearly all states now provide a special bowhunting season for deer is an indication that these needs for good and safe bowhunting are generally recognized. Some of the more important deer hunting states are providing bowhunting seasons over a month in length, some up to two months in duration. In the lake states region, Michigan led the sport in 1957 with 36,630 bowhunters. Wisconsin and Minnesota followed with 25,000 and 10,152 archery deer hunters, respectively. These three states with their roughly 72,000 bowhunters had a combined kill of 3,925 deer, indicating that 5.5 per cent were successful in bringing venison home.

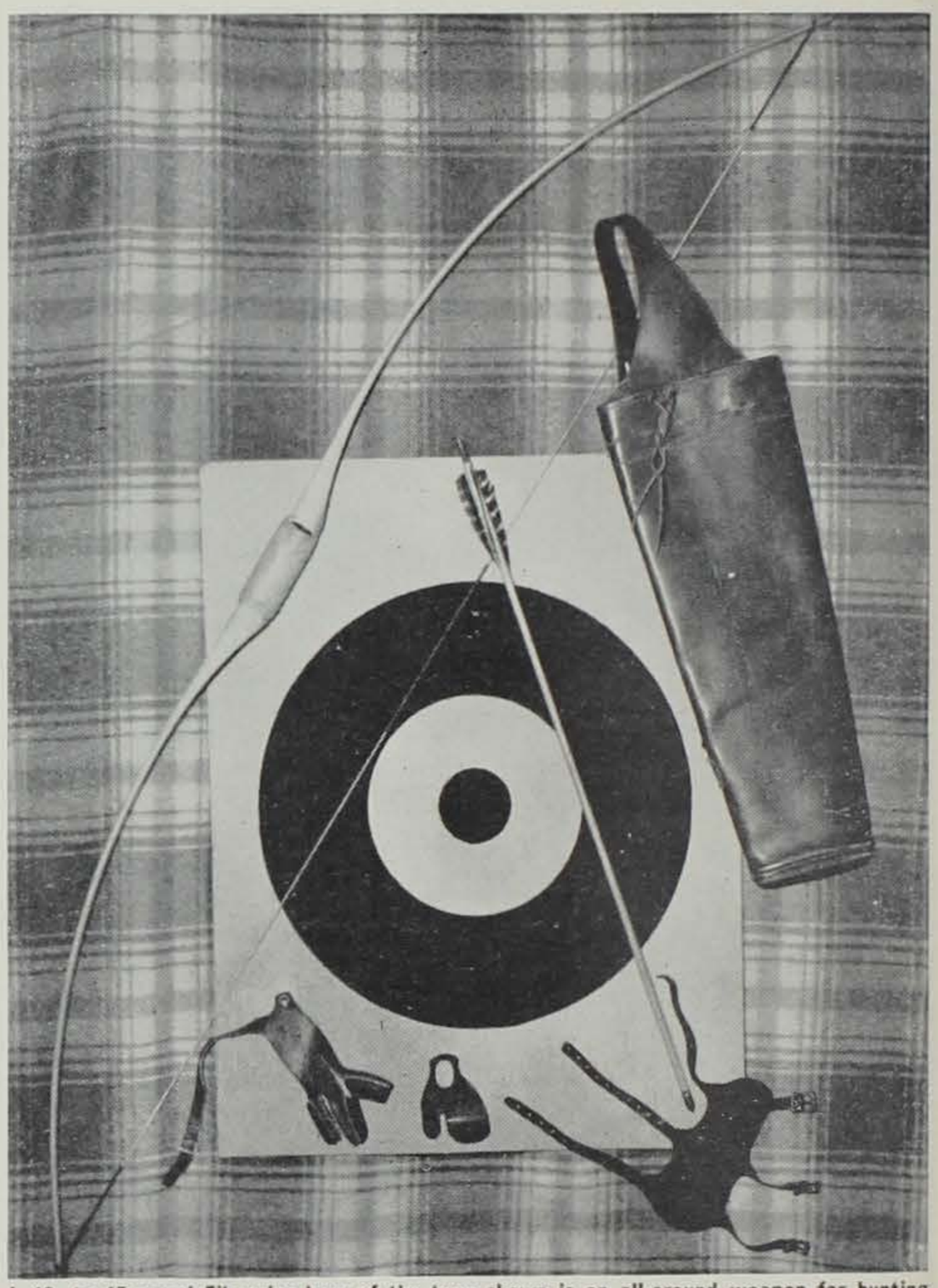
Iowa bowhunters have been outscoring "Robin Hoods" in neighboring states. Slightly over 11 per cent of the 1,228 Hawkeye state archers in 1957 brought home a total of 138 deer. Colorado archers, however, led the nation in success with 20.5 per cent of their archers bagging a deer. To promote such a sport where so many citizens can participate and still take so few deer is considered good conservation. This is so because it allows almost unlimited use of the deer herd without danger of depletion. It almost amounts to a way to eat your cake and have it, too. This is verified by facts from the 1957 season as reported by Speaker and Kline in the June 1958 issue of IOWA CONSERVATIONIST. They report that 1,212 licensed bowhunters enjoyed 51,122 hours of sport in bagging only 138 deer. Gun hunters, who numbered 5,942, took 2,187 deer in 67,947 hours of hunting.

Must Outsmart Deer

Success with the bow is dependent not only on how to shoot an arrow accurately but also on how to outsmart and approach within 50 yards of the deer. This close approach requires that one must be a good hunter. The care needed to stalk deer becomes doubly apparent when one realizes that the deer being stalked owes its life to its constant alertness.

Deer bagged in the bow season are taken at an average distance of about 30 to 35 yards. To make a kill, even at this distance, is no easy task because the vital "killing area" of a deer—the chest—is only about 10 or 11 inches from top to bottom and 12 to 15 inches from front to back. In addition, the first arrow must do the "trick" as a deer seldom lingers long enough for a second shot.

The first arrow in particular is difficult to speed on its way with accuracy as the hunter is usually excited and tense when he gets his chance. If a bowhunter could stop to warm up as does a baseball pitcher before he goes into a game, many more deer would be bagged. Part of the fun in bowhunting, however, comes from the knowledge that one is handicapped and, perhaps, suffering from a mild case of "buck fever." To a bowhunter, a miss is no catastrophe. He can often enjoy a miss almost as much as a hit because the flight of the arrow can be followed, showing how wide or short of the mark the arrow fell, or how a sapling or overhanging branch deflected the arrow. The measure of the appeal of any sport is in the excitement it offers. The excitement or fun in a hunt is in the chase.



A 40- to 45-pound Fiberglas bow of the type shown is an all-around weapon for hunting deer, cottontails, or for field archery. A target-type arrow is shown. For protection of fingers, a hunter has a choice between a shooting glove or finger tabs, shown with an arm guard. The leather shoulder quiver is the one most commonly used.

* * * * * * * * * * *

Any good bow with a pull of 40 pounds is strong enough for deer hunting. In fact, our modern bows, most of which are now made of Fiberglas, are no doubt superior in killing power to those depended upon by the Indians in Iowa before the time of Chief Black Hawk. I say before the time of Black Hawk because the warriors in his Sac tribe were already well armed with rifles.

Iowa regulations require that a bow for deer hunting must have

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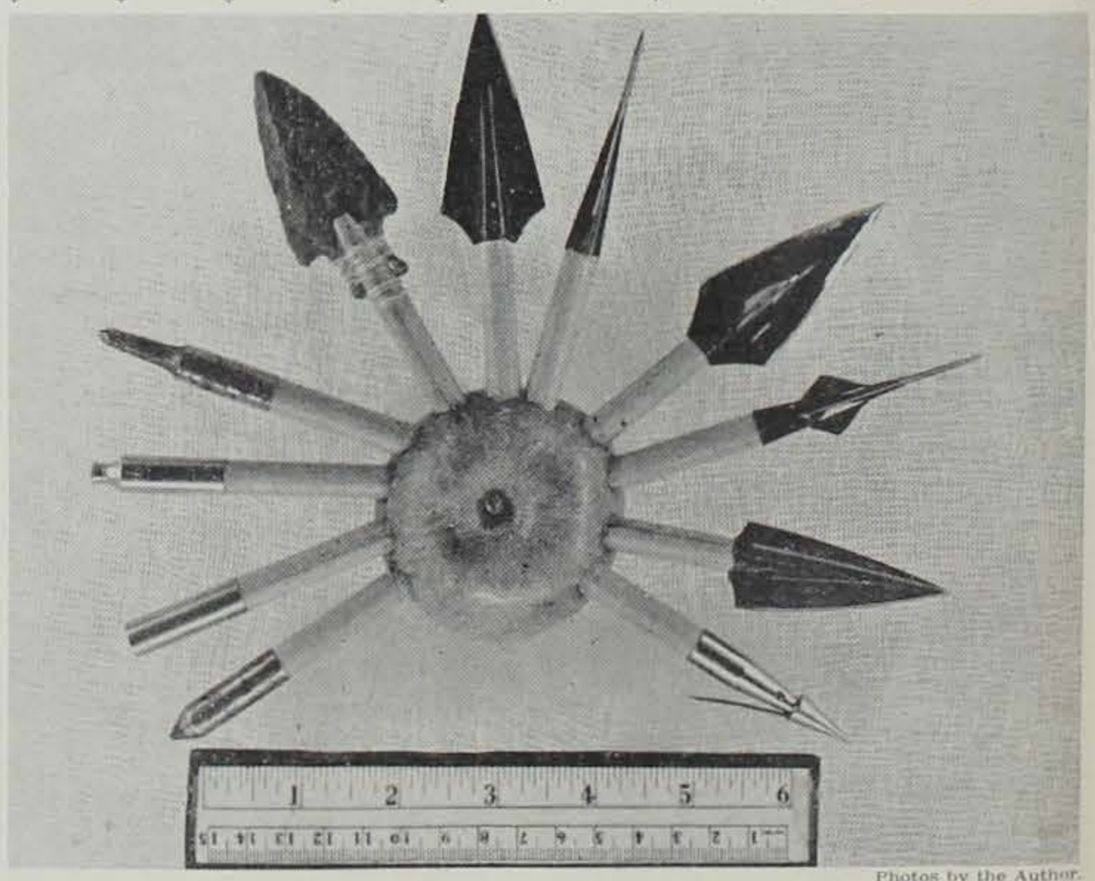

Photos by the Author.

The single-blade steel broadhead point shown next to the flint Indian arrowhead is the one most commonly used by present-day bowhunters. Rounded heads on the left are used for small game and for field archery. The barbed point at the lower right is used for shooting rough fish.

THE AUTHOR

Dr. Haugen has been a bowhunter for a number of years in the states of Michigan and Alabama. He is a native of Iowa. Several national magazines have featured his articles on archery deer hunting. He has been active in the National Field Archery Association for 15 years, serving a term as president of the national Association. At the present time, Dr. Haugen is vice president and a nominee for the presidency of the Association.

Bow and Arrow Deer Hunting in Iowa

Year	Number hunters	Number deer killed	Per cent hunters successful	Bow season dates	Shotgun season dates
1953	10	1	10	Dec. 10-14	Dec. 10-14
1954	92	10	10.9	Dec. 1-12	Dec. 10-12
1955	414	58	14	Oct. 29-Dec. 7	Dec. 5- 7
1956*	1280	117	9.1	Oct. 13-Nov. 12	Dec. 8-10
1957	1228	138	11.4	Oct. 26-Nov. 25	Dec. 7- 8
Total	3024	324	10.7		

*First season requiring a special bow and arrow deer hunting license.

a pull of at least 40 pounds. On the basis of 16 years personal bowhunting, and three years of experience in administering checking stations on special bowhunting areas in Michigan, a Fiberglas bow with a pull of between 40 and 50 pounds is recommended for deer hunting. The old-fashioned wood bows are as outmoded as a Model-T and where such a weapon is used it must have a heavier pull to be comparable in striking power. Inaccurate shooting usually results if a hunter uses a bow that is too heavy.

Today's bowhunter has a choice of a number of types of arrowheads for his hunting arrow. Some of these are shown in an accompanying photograph. The deer hunter is concerned only with a choice between the bladed or broadhead-type of heads. In general, they rank from a single blade with two cutting edges to three- and four-bladed heads. All of the broadhead hunting arrows on the market are adequate for deer hunting. However, the all-important thing to remember is that most of them are not adequately sharpened at the factory and should be filed or honed to a razor-sharp edge before used. Since broadheads kill by hemorrhage alone and not by shock as a bullet frequently does, it must do an efficient job of cutting. A hit in the lungs causes their collapse and death from bleeding and/or suffocation. Hits in other vital parts are equally fatal.

Obviously some crippling loss results from any type of hunting weapon. Results from other states show that about one deer of every five hit is not recovered. This is true for both high-powered rifles and archery tackle. During one bowhunting season in Michigan, game managers reported spending 853 hours on foot in the deer woods during which time they saw two dead deer. Careful examination disclosed both had died from poachers' bullets.

How to Get Started

If you, too, are one of the increasing numbers of sportsmen who have been "bitten by the archery deer hunting bug," here are some tips to help you. If there is an experienced bowhunter in your neighborhood, go see him for ideas before you buy any equipment. He will probably tell you to buy a glass bow with a pull of around 45 pounds. Such a bow will cost you anywhere from $20 to $50, depending on your desires as to brands or types. As a beginner, there is no need to look for one with curved tips. A bow doesn't have to be fancy to be good and serviceable. Your broadhead arrows will probably cost about $1.25 apiece, and you will want to buy at least six. An arm guard, which is designed to keep your coat out of the way of the bowstring and to protect your arm from getting a real "whack" from the string will cost in the neighborhood of $2.25. Leather finger tabs to protect your fingers from the string when shooting will cost you less than a dollar. A reasonably good leather shoulder quiver for carrying your broadhead arrows can be purchased for about $12.

In the end, the archery deer hunting "bug will have bitten" you for a total of about $41 for a reasonably good deer hunting outfit. By the time you have purchased your $10 archery deer hunting license, you will have invested at least $50, all for the privilege of participating in today's fastest growing sport.

For clothes, it is best to wear garments with drab colors with no white showing. For stalking a deer, remember you will have to be as "sneaky" as a 'possum or sly as a fox. You have to see the deer before it sees you, then you either have to detour and place yourself about where the deer will pass close enough for a shot, or you will have to stalk to within 30 or 40 yards of your quarry before you shoot. This requires real stealth. You may even have to crawl on your hands or knees or drag yourself on your flat "tummy" as an infantryman does to keep from being seen.

Archers with the "patience of Job" are content to find a deer runway and then conceal themselves in brush about 30 yards downwind from the trail and just wait for the deer to come by. The best time for such still hunting on runways is from dawn to about 8:00 a.m. and again from about 3:00 p.m. until quitting time. Shooting hours for bowhunting in 1958 are from 6:30 a.m. to 5:30 p.m.

If you want to share in the experiences of other bowhunters and see the types of equipment now available, you may want to enroll in a national archery organization. One such organization is the National Field Archery Association at Redlands, California. Membership in this association includes a subscription to *Archery* magazine. Cost of the publication is $4 per year.

If you are the type of person who enjoys a real challenge, try bowhunting and you may find the thrill of a lifetime. Perhaps you owe it to yourself to try hunting with a bow so that you may appreciate the difficulty your distant ancestors encountered in feeding themselves by the use of their crude weapons. If you get enjoyment out of pitting your skill against the instinct of animals; if you enjoy the silent and undisturbed out-of-doors; and if you enjoy trying to get a deer with odds against you instead of against the deer, then you will get a big kick from bowhunting.

There is a real thrill in hunting deer, knowing that all the force or power in your weapon comes from your own strength and that the opportunity for the shot came from outsmarting one of nature's wild animals. Try it sometime! Have a good time, but remember the archer's motto, "Good Sportsmanship Above All Else."

The fun of a hunt is in the chase and in getting ready for it. Here an archer is preparing for the day's hunt by filing his broadhead to a keen edge.

VOTING ON STATE TREE CONTINUES

Those who failed to vote for a state tree at the state fair may still do so by letter or postal card to the IOWA CONSERVATIONIST.

Your choice should be made from one of the eight tree species that have been nominated. These include Black Walnut, White Oak, Black Maple, Red Oak, Basswood, Hackberry, Green Ash and Bur Oak.

List your choice and mail together with your name and address to Editor, IOWA CONSERVATIONIST, State Conservation Commission, East 7th and Court Ave., Des Moines 9, Iowa. We will see that your vote is delivered to the Plant Iowa Committee officials for tabulation with the ballots already on file.

WATERFOWL . . .

(Continued from page 65)

(8). Not more than four (4) canvasbacks or four (4) redheads or two (2) canvasbacks and two (2) redheads may be in possession.

Shooting dates and hours for American and red-breasted mergansers is the same as other ducks. The daily bag limit of these species is five (5), either singly or in aggregate. Possession limit is ten (10) singly or in aggregate.

Shooting hours and season dates for geese is the same as ducks. The daily bag limit of geese is five (5) of which not more than two (2) may be Canada, Hutchins, cackling, or whitefronted geese. Two (2) of any of these species may be included in the limit. The entire bag may be made up of either blue or snow geese or any combination of these species. The possession limit is the same as a single day's bag limit. There is no open season on Ross geese.

Coots or mudhens may be taken during the season dates and within the same shooting hours as those set for ducks and geese. The daily bag limit of coots is ten (10) with a possession limit of ten (10).

Wilson's snipe or jacksnipe may be taken throughout the entire state from October 4 to November 2, both dates inclusive. Shooting hours for snipe is one-half hour before sunrise to sunset each day of the open season. The daily bag limit is eight (8) with a possession limit of eight (8).

There is no open season in Iowa on wood ducks, grebes, rails (except coots), gallinules, mourning doves, woodcock and swans.

DOVES . . .

(Continued from page 67)

a game species. Furthermore, if the dove were added to the list of game species, the Commission would feel obligated to try to help increase their numbers by plantings of shrubs and trees to encourage nesting, and even managing certain weed crops to provide the seeds which doves like. It is quite possible that we might end up with more doves than we had before.

Geology In Viking Lake Park

C. S. Gwynne
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Viking Lake, Iowa's newest state park, is in the hilly country of southeastern Montgomery County a few miles east of Stanton, and northwest of Villisca.

Taking a look at the geology of the park, it might be well to consider first the origin of this hilly country. Surprisingly enough to many, it turns out that when the last glacier melted away, the country hereabouts was left almost flat. Then the streams began flowing and cutting their valleys. So now the park area is mostly slopes. So, for that matter, is most of Montgomery County, in which the park lies. So, too, is most of southern Iowa—and for the same reason.

For millions of years before the coming of the glaciers the land of this area had been subject to erosion by running water. No one knows exactly what it looked like then, but it may have been hilly just as it is now. About 300,000 years ago, the land as far south as the Missouri River became covered by a glacier of continental dimensions. It was similar to the enormous ice caps of the South Pole . . . or to the one in Greenland of today. World climate was such that it had formed in Canada and then spread in all directions.

With a reverse change in climate, to one much like we have today, the ice slowly melted away. Presently another change of climate brought another glacier into existence. This second one also extended over all of southern Iowa.

When it melted away, perhaps, 150,000 years ago, the country was left the rather featureless plain referred to above. Not absolutely flat, but with some low hills here and there, shallow drainageways, and many undrained depressions.

Then running water began its work, continued it through the years, and is still at it. No wonder that the terrain surrounding Viking Lake is so hilly. No wonder that so much is in slopes, and that so little of the upland plain is left.

And fortunate it is that the valley in which the lake lies is there for our pleasure. All that had to be done to complete the lake basin was to put in a dam across the valley. A small job, really, compared with what running water had been able to do through the thousands of years.

Yet the dam is a large one, and there again the glacier helped—in this case, with materials for the dam construction. According to the record, the dam is 400 feet wide at the base, 55 feet high, and 1,250 feet in length. There were 297,000 cubic yards of earth used in its construction, and most of this was material which was brought to this part of the country by the glacier. It was mostly the soil and subsoil of the country to the north, from away up in Canada, that had become frozen in the bottom of the ice. When the last ice melted, there it was—a blanket over all of southern Iowa, averaging more than 100 feet in thickness. The earth for the dam construction was scooped from the sides of the valley nearby.

This glacial deposit, called drift, is mostly clay and silt. But it also contains stones of all sorts. These were once part of the solid rock of the earth's crust north of Iowa. In the park, they may be found wherever the bare subsoil is at the surface. A ravine cutting into the hillside near the boat dock shows many of these strange stones. They might also be found at the dam, wherever it is not covered with the broken rock called riprap, and put there to protect the dam from wave action.

Another earthen material was used with the drift in the dam construction. This is a silty material called loess. It lies on top of the drift, forming a sort of blanket, up to a few feet in thickness. It is believed to have been deposited by the wind. This was during another, and later, glacial stage—one in which the ice did not get this far south. Most of the road-cuts in the vicinity of the park expose this loess. Some get down to the glacial drift. In the glacial drift, toward the top, are small whitish objects. These are called concretions. They were deposited from water seeping through the drift.

Now, let us turn to another matter. The road through the park is made of crushed rock. What kind of rock is it, and where did it come from? The rock is limestone. It came from one of the quarries in the northern part of Montgomery County, as did also the broken rock used as riprap.

At the quarry the rock would be found to be in layers up to a few feet thick. This limestone, together with layers of interbedded shale, was laid down as sediment in an ancient sea. Impressions of the forms of life of the ancient sea are present in the limestone and shale. Many are found in the broken rock at the dam. They are called fossils.

The most common fossil is that of a marine invertebrate called a brachiopod. This was a two-shelled animal somewhat like a clam or an oyster. The two shells were unlike. Each shell could be split down the middle into two like halves. Thus it is said to be bilaterally symmetrical.

Pieces of crinoid stems are also found in the limestone and shale. These fragments are cylindrical, possibly as much as a half-inch in diameter and up to a few inches long. The crinoid, also an invertebrate animal, lived in a small thimble-shaped enclosure at the top of the stem. The enclosure, or cup, was an inch or more in diameter and made of many small pieces of shell. When the animal died, the stem and cup fell to the bottom and went to pieces. So the pieces of crinoid stem are of varying lengths. These crinoids were relatives of the star fish, though they certainly don't look it.

Some of the pieces of rock are crowded with what appear to be grains of wheat. These are fossilized single-cell animals called fusilinids.

That fine sandy beach is another geological feature worthy of note. It was not present when the dam was built. The sand was brought from Plattsmouth, Nebraska. Why from so far away? For the simple reason that it was the most convenient place whence such clean sand could be secured. At Plattsmouth, it is scooped from the Platte River and washed and screened to free it from clay and silt.

The shores of this lake, as is the case with those of any artificial lake, will be worn upon by the waves. At the time this is written, the lake is only partly filled, but perhaps by the fall of 1958 or the spring of 1959, it will be up to spillway level. From then on, it will be of interest to the geological-minded to observe the changes in the shore line, decade by decade. Low bluffs will develop, particularly on the points sticking out into the lake. The material eroded from the shore will be carried into the lake, thus contributing to its shallowing. Of course, sediment will also be brought in by the incoming streams which drain an area of about 2,200 acres.

The lake now has an area of 150 acres, a maximum depth of 46 feet, and a shoreline of 4½ miles. It will continue for many years as a monument to the work of glaciers, running water, and the men who contributed to its development.

* * * * * * * * * * *

Photo by the Author.

The author was successful in obtaining some fossils from Viking's limestone deposits. At the left are fragments of crinoid stems. Brachiopod shells and fragments are shown on the right.

PARKS . . .

(Continued from page 65)

agencies exist in all 48 states with the first state park being attributed to California in about 1870 in a portion of the area now known as Yosemite National Park. Iowa established her first state park in 1919 under authority granted by the legislature two years earlier. Backbone, the first state park, is located in northeast Iowa near the town of Strawberry Point. The latest area acquired but not yet developed is Prairie Rose State Park in Shelby County near Harlan. This brings Iowa's total number of state parks to 91 and includes approximately 28,000 acres.

The nation's system of state parks is big business as indicated by the 1957 attendance of 216,780,000 visitors. Iowa attracted 6,400,000 of the total, ranking ninth in the nation in attendance. The number of visitors in Iowa parks has tripled since World War II. This is more significant when we see that Iowa ranks 22nd in population according to the 1950 census.

We, in Iowa, are fortunate to have acquired such a fine system of state parks and preserves. This was accomplished by a combination of early planning, through the "Iowa Twenty-five Year Conservation Plan" instigated in 1933, and the Federal participation in the 1930's. Various Federal Agencies such as the National Park Service, Civilian Conservation Corps, Works Progress Administration, and many others, worked in nearly half of the present areas under the Federal Relief Program of the Thirties. The cost of labor was reasonable and unlimited at that time. This tremendous building program was fine, but it did leave Iowa with problems that are seemingly difficult to solve in this time of costly construction and maintenance. Many of these fine

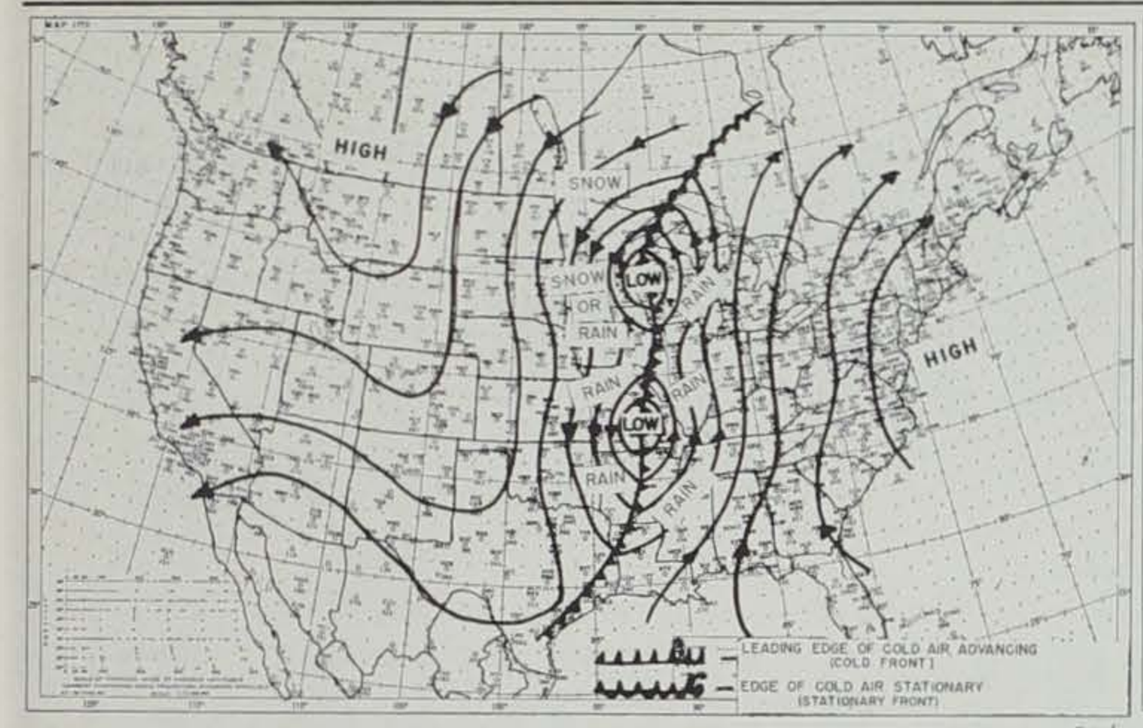

FIG. 1

Maps by the Author.

According to the theory of several waterfowl experts, this is the type of weather system that "triggers" migration of waterfowl. When strong winds and snow accompanies the system, theorists believe mass migrations of ducks push down the flyway.

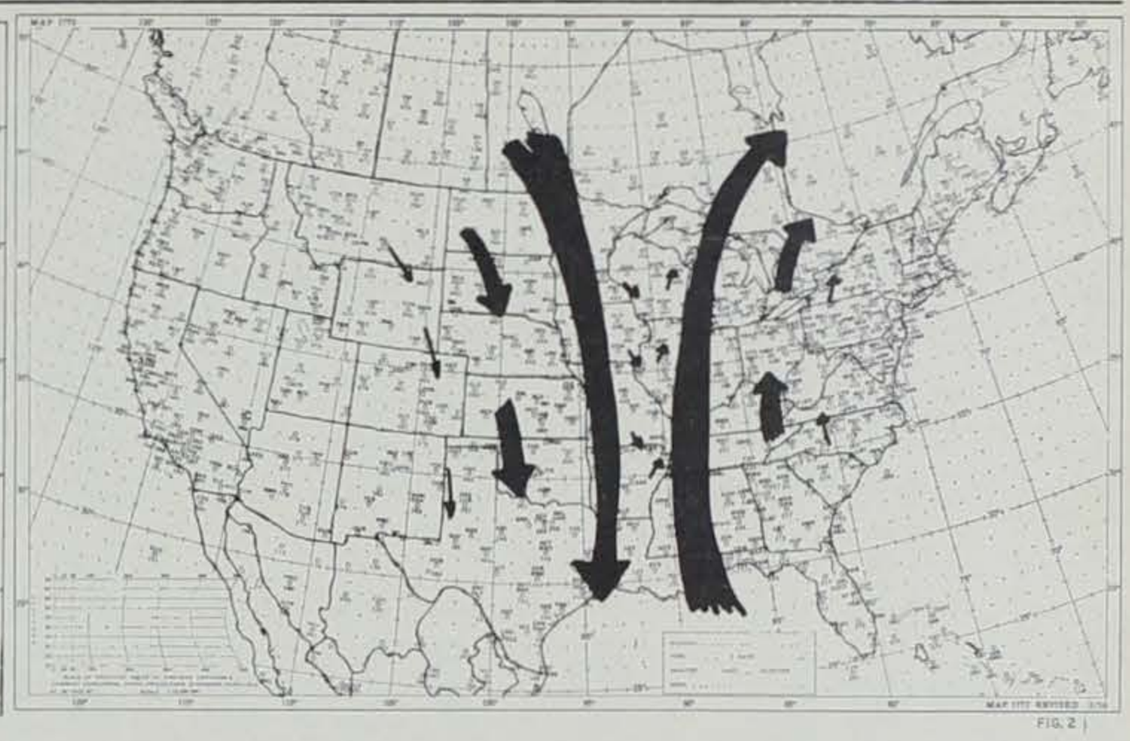

FIG. 2

The author shows on this map the formation and movements of air currents that are an important part of the weather system and waterfowl movements. Ducks take advantage of strong north winds to hasten their travel south.

WEATHER . . .

(Continued from page 65)

area covered. Some are purely local, others are nationwide, and in the case where the meteorologist is a hunter he may even furnish specific information on "duck weather" forecasts or shape-ups.

Al Hochbaum, a "duck researcher" of the first magnitude, has been associated with this problem for some time. In his latest book, "Travels and Traditions of Waterfowl," he discusses some of the whys behind duck movements, and indicates the surface weather pattern associated with certain mass migrations in years past. Fig. 1 graphically indicates the general surface weather pattern preceding a push of ducks out of the north. The winds which blow counter-clockwise around a low pressure system and clockwise around a high pressure area, tend to form a wind tunnel through which the ducks can pour down into the mid-west.

The main prerequisite is the long fetch of northerly winds that are associated with this surface pattern. Aloft where the ducks fly and where the influence of the surface conditions is minimized to some extent, the streamlines take on the definite trough pattern. (See Fig. 2).

Both the surface pattern and the pattern aloft make their way eastward and the following 24 hours produces the surface pattern indicated by Hochbaum as being associated with certain mass migrations. That pattern is not reproduced here as most interested parties should be out in their blinds looking for ducks, not weather patterns, if they spot a pattern like Fig. 1 in their paper or on their television.

With average flight speeds of 40-60 m.p.h., assisted by winds of 60-80 m.p.h., the ducks can cover 1,000-1,400 miles during the ten hours of daylight and in 24 hours flight can cover 2,400-3,360 miles. No wonder wildfowl pick this weather pattern!

In the fall, watch for the pattern in Fig. 1 in your newspaper or over your television. When it's coupled with reports of snow and cold in the Canadian prairies and northern plains it won't be long until those quacking targets are winging their way past the blind.

A word of caution, though . . . the supply of moisture available in the stream of air from the south in a pattern like this determines whether or not low clouds and rain or snow accompany the system, which in turn determines whether the flight is one with low or high flying ducks. Unless the chart shows rain or snow and cloudy skies with the system, expect to see one of those migrations with high flying ducks which for the most part will be out of range for even the super magnums.

The one redeeming factor in even a mass migration of high flyers, is that some of them will drop out in Iowa if the conditions for food and water are attractive enough. Food we have plenty of . . . water is something else again.

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facilities built in the Thirties are 25 years old and are badly in need of repair. The over use of existing facilities is creating a crisis for these fine areas. They should be preserved primarily for their natural attractiveness, historical and scientific interests. It is hoped that the people of Iowa will recognize the financial needs of Iowa's parks and will provide through the State legislature the means to adequately maintain these areas.

It is interesting to note that the national average expenditure per park visitor in 1957 for maintenance and operation of state parks was 19 cents per park visitor, while the available money for state parks in Iowa is only 6½ cents per park visitor. There must be more money for park maintenance if Iowa is to maintain her fine standing in the field of state parks. It is not necessary to panic in this time of crisis in park management to the extent that we permit commercialization to take over in an attempt to support state parks. If it were possible for state parks to be self supporting, they would not be left in the hands of state government, but turned over to private enterprise. State parks have inspirational and other intangible values that are so often found in other tax supported facilities such as libraries, art museums, etc.

State parks are beneficial to industrial growth, public health, community improvement programs, education and numerous other activities for the general welfare of society, thus making the support of state parks everyone's responsibility rather than merely those who walk through the gates. Attempts to make "tourist traps" and commercialized areas out of our State Parks through introduction of entrance fees, road tolls, etc., will discourage full use of the parks and will not make a significant contribution to state park support after collection expenses are deducted. The most logical solution is to create a better understanding of the problem by the people of Iowa so that through their legislature they will act to support state parks properly and preserve their true purpose.

The "Iowa Twenty-five Year Conservation Plan" celebrates its 25th Anniversary this year and the Conservation Commission has authorized a new ten-year plan study. It will soon be available to continue the systematic program of providing for the needs of the state. A group of experts in the various fields of conservation are studying the problems in order to give Iowa a program compatible with her needs and economy.

In any major undertaking that is to be worthwhile, there must be a plan and the "Iowa Twenty-five Year Conservation Plan" has served the Conservation Commission well over the years. This plan was developed by experts in the field of conservation from all over the nation drawing upon the best talent available. It has given Iowans one of the best park systems in the nation and under the new plan it will assure continued success if the legislature provides the means to carry it out.

Jim Sherman Photo.

More Iowans are going outdoors, putting a strain on park facilities as indicated in this recent photo at Lake Ahquabi. Iowa, which ranks ninth in the nation in park attendance, is trying to keep up with the crowds on a budget less than some city park systems.

DUCK HUNTING HOURS

CENTRAL STANDARD TIME

STATE OF IOWA—30 MINUTES BEFORE SUNRISE SCHEDULE AND SUNSET SCHEDULE

1958 IOWA CONSERVATION COMMISSION

(Note: This table has been compiled from official schedules furnished by the Weather Bureau Stations listed. A schedule from Omaha, Nebraska, Station is used because there is no station in southwestern Iowa. The difference in time between stations should be taken into consideration in figuring the exact time at your particular location.)

	DAVENPORT		BURLINGTON		DUBUQUE		KEOKUK		WATERLOO		DES MOINES		OMAHA, NEBR.		SIOUX CITY	
	30 Min. Before Sunrise	Sunset	30 Min. Before Sunrise	Sunset	30 Min. Before Sunrise	Sunset	30 Min. Before Sunrise	Sunset	30 Min. Before Sunrise	Sunset	30 Min. Before Sunrise	Sunset	30 Min. Before Sunrise	Sunset	30 Min. Before Sunrise	Sunset
Oct. 4	5:31	5:39	5:33	5:41	5:33	5:39	5:35	5:43	5:39	5:45	5:44	5:51	5:53	6:01	5:56	6:02
5	5:32	5:38	5:34	5:40	5:34	5:38	5:36	5:42	5:40	5:44	5:45	5:50	5:54	6:00	5:57	6:01
6	5:33	5:37	5:34	5:39	5:34	5:38	5:37	5:41	5:41	5:43	5:46	5:49	5:54	5:59	5:57	6:01
7	5:34	5:36	5:35	5:38	5:36	5:36	5:38	5:39	5:42	5:41	5:46	5:48	5:56	5:58	5:58	5:59
8	5:36	5:35	5:37	5:36	5:37	5:34	5:38	5:39	5:43	5:40	5:48	5:46	5:57	5:56	5:59	5:57
9	5:37	5:33	5:38	5:34	5:38	5:33	5:39	5:37	5:44	5:38	5:48	5:44	5:58	5:54	6:00	5:56
10	5:38	5:31	5:39	5:33	5:39	5:31	5:40	5:36	5:45	5:36	5:50	5:43	5:59	5:53	6:01	5:54
11	5:39	5:29	5:40	5:31	5:40	5:30	5:41	5:34	5:46	5:35	5:51	5:41	6:00	5:51	6:03	5:52
12	5:40	5:28	5:41	5:30	5:41	5:28	5:43	5:32	5:48	5:33	5:52	5:40	6:01	5:50	6:04	5:51
13	5:41	5:26	5:42	5:28	5:42	5:26	5:44	5:31	5:49	5:31	5:53	5:38	6:02	5:48	6:05	5:49
14	5:42	5:24	5:43	5:27	5:44	5:25	5:45	5:29	5:50	5:30	5:54	5:37	6:03	5:47	6:06	5:48
15	5:43	5:23	5:44	5:25	5:45	5:23	5:46	5:28	5:51	5:28	5:55	5:35	6:04	5:45	6:07	5:46
16	5:44	5:22	5:45	5:24	5:46	5:21	5:47	5:26	5:52	5:26	5:57	5:33	6:06	5:43	6:08	5:44
17	5:45	5:20	5:46	5:22	5:47	5:20	5:48	5:25	5:53	5:25	5:57	5:32	6:06	5:42	6:09	5:43
18	5:47	5:19	5:47	5:21	5:48	5:18	5:49	5:23	5:55	5:23	5:59	5:30	6:08	5:40	6:11	5:41
19	5:49	5:18	5:49	5:19	5:49	5:17	5:50	5:22	5:56	5:22	6:00	5:29	6:09	5:39	6:12	5:40
20	5:50	5:16	5:50	5:18	5:50	5:15	5:51	5:21	5:57	5:20	6:02	5:27	6:11	5:37	6:13	5:38
21	5:51	5:15	5:51	5:16	5:52	5:14	5:52	5:19	5:58	5:18	6:02	5:26	6:11	5:36	6:15	5:36
22	5:52	5:14	5:52	5:15	5:53	5:12	5:53	5:18	5:59	5:17	6:04	5:24	6:13	5:34	6:15	5:35
23	5:53	5:12	5:53	5:13	5:54	5:11	5:54	5:17	6:00	5:16	6:04	5:23	6:13	5:33	6:17	5:33
24	5:54	5:11	5:54	5:12	5:55	5:09	5:55	5:15	6:02	5:14	6:06	5:21	6:15	5:31	6:18	5:32
25	5:55	5:10	5:55	5:10	5:56	5:08	5:57	5:14	6:03	5:13	6:06	5:20	6:15	5:30	6:20	5:30
26	5:56	5:08	5:56	5:09	5:58	5:06	5:58	5:13	6:04	5:12	6:07	5:19	6:16	5:29	6:21	5:29
27	5:58	5:06	5:58	5:08	5:59	5:05	5:59	5:11	6:05	5:10	6:10	5:17	6:19	5:27	6:22	5:27
28	5:59	5:05	5:59	5:06	6:00	5:04	6:00	5:10	6:06	5:09	6:10	5:16	6:19	5:26	6:23	5:26
29	6:00	5:03	6:00	5:05	6:01	5:02	6:01	5:09	6:08	5:07	6:12	5:14	6:21	5:24	6:24	5:25
30	6:01	5:02	6:01	5:04	6:02	5:01	6:02	5:07	6:09	5:06	6:13	5:13	6:22	5:23	6:26	5:23
31	6:02	5:01	6:02	5:02	6:04	5:00	6:03	5:06	6:10	5:05	6:13	5:12	6:22	5:22	6:27	5:22
Nov. 1	6:03	4:59	6:04	5:01	6:05	4:58	6:04	5:05	6:11	5:03	6:16	5:10	6:25	5:20	6:27	5:21
2	6:05	4:58	6:05	5:00	6:06	4:57	6:05	5:04	6:13	5:02	6:17	5:09	6:26	5:19	6:30	5:19
3	6:06	4:57	6:06	4:59	6:08	4:56	6:07	5:03	6:14	5:01	6:18	5:08	6:27	5:18	6:31	5:18
4	6:07	4:56	6:07	4:58	6:09	4:55	6:08	5:01	6:15	5:00	6:19	5:07	6:28	5:17	6:32	5:17
5	6:08	4:55	6:08	4:57	6:10	4:53	6:09	5:00	6:16	4:59	6:20	5:06	6:29	5:16	6:33	5:16
6	6:10	4:54	6:10	4:56	6:11	4:52	6:10	4:59	6:18	4:57	6:22	5:05	6:31	5:15	6:35	5:14
7	6:11	4:52	6:11	4:54	6:12	4:51	6:11	4:59	6:19	4:56	6:23	5:03	6:32	5:13	6:36	5:13
8	6:12	4:51	6:12	4:53	6:14	4:50	6:12	4:57	6:20	4:55	6:24	5:02	6:33	5:12	6:37	5:12
9	6:13	4:50	6:13	4:52	6:15	4:49	6:14	4:56	6:21	4:54	6:25	5:01	6:34	5:11	6:38	5:11
10	6:14	4:49	6:14	4:51	6:16	4:48	6:15	4:55	6:23	4:53	6:26	5:00	6:35	5:10	6:39	5:10
11	6:15	4:48	6:15	4:51	6:18	4:47	6:16	4:54	6:24	4:52	6:27	4:59	6:36	5:09	6:41	5:09
12	6:17	4:47	6:16	4:50	6:19	4:46	6:17	4:54	6:25	4:51	6:29	4:58	6:38	5:08	6:42	5:08
13	6:18	4:46	6:18	4:49	6:20	4:45	6:18	4:53	6:27	4:50	6:30	4:57	6:39	5:07	6:43	5:07
14	6:19	4:45	6:19	4:48	6:21	4:44	6:19	4:52	6:28	4:49	6:31	4:57	6:40	5:07	6:44	5:06
15	6:20	4:44	6:20	4:47	6:22	4:43	6:20	4:51	6:29	4:48	6:32	4:56	6:41	5:06	6:46	5:05
16	6:21	4:43	6:21	4:46	6:23	4:42	6:22	4:50	6:30	4:47	6:33	4:55	6:42	5:05	6:47	5:04
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21	6:27	4:40	6:27	4:43	6:29	4:39	6:27	4:47	6:37	4:43	6:39	4:51	6:48	5:01	6:54	5:00
22	6:28	4:39	6:28	4:42	6:31	4:38	6:28	4:46	6:38	4:42	6:40	4:51	6:49	5:01	6:55	4:59
23	6:30	4:39	6:29	4:42	6:32	4:37	6:29	4:46	6:39	4:42	6:42	4:50	6:51	5:00	6:55	4:59
24	6:31	4:38	6:30	4:41	6:33	4:37	6:31	4:45	6:40	4:41	6:43	4:50	6:52	5:00	6:57	4:58
25	6:32	4:37	6:31	4:41	6:34	4:36	6:32	4:45	6:40	4:40	6:44	4:49	6:53	4:59	6:59	4:57
26	6:33	4:37	6:32	4:40	6:35	4:36	6:33	4:44	6:43	4:40	6:45	4:49	6:54	4:59	7:00	4:57
27	6:34	4:36	6:33	4:40	6:36	4:35	6:34	4:44	6:44	4:39	6:46	4:48	6:55	4:58	7:01	4:56
28	6:35	4:36	6:34	4:39	6:37	4:35	6:35	4:43	6:45	4:39	6:47	4:48	6:56	4:58	7:02	4:56
29	6:36	4:35	6:35	4:39	6:38	4:35	6:36	4:43	6:46	4:38	6:48	4:47	6:57	4:57	7:03	4:55
30	6:37	4:35	6:36	4:39	6:40	4:34	6:37	4:43	6:47	4:38	6:49	4:47	6:58	4:57	7:04	4:55
Dec. 1	6:38	4:35	6:37	4:38	6:41	4:34	6:38	4:42	6:48	4:38	6:50	4:47	6:59	4:57	7:05	4:55
2	6:39	4:34	6:38	4:38	6:42	4:34	6:39	4:42	6:49	4:37	6:51	4:46	7:00	4:56	7:06	4:54
3	6:40	4:34	6:39	4:38	6:43	4:33	6:40	4:42	6:50	4:37	6:52	4:46	7:01	4:56	7:07	4:54
4	6:41	4:34	6:40	4:38	6:44	4:33	6:41	4:42	6:51	4:37	6:53	4:46	7:02	4:56	7:08	4:54
5	6:42	4:34	6:41	4:38	6:45	4:33	6:42	4:42	6:52	4:37	6:54	4:46	7:03	4:56	7:09	4:54
6	6:43	4:34	6:42	4:38	6:46	4:33	6:43	4:42	6:53	4:37	6:55	4:46	7:04	4:56	7:10	4:54
7	6:44	4:34	6:43	4:38	6:47	4:33	6:44	4:42	6:54	4:37	6:56	4:46	7:05	4:56	7:11	4:54
8	6:45	4:34	6:44	4:38	6:48	4:33	6:45	4:42	6:55	4:37	6:57	4:46	7:06	4:56	7:12	4:54
9	6:46	4:34	6:45	4:38	6:48	4:33	6:45	4:42	6:56	4:37	6:58	4:46	7:07	4:56	7:13	4:54
10	6:47	4:34	6:46	4:38	6:49	4:33	6:46	4:42	6:57	4:37	6:59	4:46	7:08	4:56	7:14	4:54
11	6:48	4:34	6:47	4:38	6:50	4:33	6:47	4:42	6:58	4:37	7:00	4:46	7:09	4:56	7:15	4:54
12	6:49	4:34	6:47	4:38	6:51	4:33	6:48	4:42	6:59	4:37	7:00	4:46	7:09	4:56	7:16	4:54

The Snowy Owl, a bird of the northern tundra, is known in the United States only when failure of the lemming cycle drives it South.

After the young robin hatches from the greenish blue egg, he averages eating 14 feet of earth worms every day.

The skunk uses his potent scent sparingly. He produces it at the rate of only about one-third liquid ounce per week.

Although the flea only measures about one tenth of an inch, he is capable of leaping 12 inches or about 200 times his own body length.

The wings of the butterfly are colorful because they are crossed by many minute ridges which break up the light into irridescent colors.

Rabbits are believed to be one of the most ancient living mammals on the North American continent.

The Leopard Frog is widely used in studies of comparative anatomy. In addition, it also provides frog-leg dinners.

Owls can't move their eyes in their sockets, but they can rotate their heads in a 270 degree arc and thus have a wide range of vision.