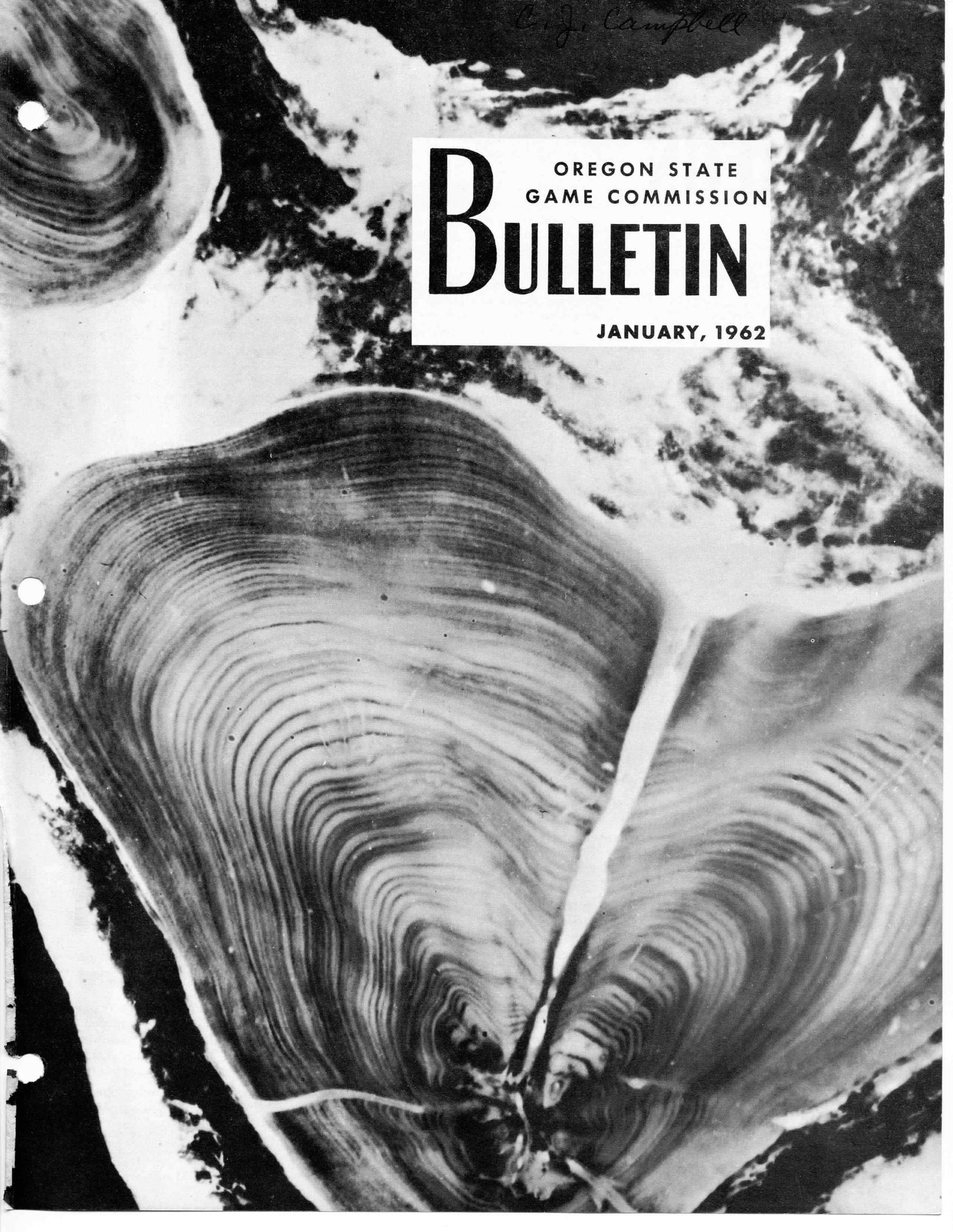


C. J. Campbell

OREGON STATE
GAME COMMISSION
BULLETIN

JANUARY, 1962



OREGON STATE GAME COMMISSION BULLETIN

JANUARY, 1962

Number 1, Volume 17

Published Monthly by the

OREGON STATE GAME COMMISSION
1634 S. W. Alder Street — P. O. Box 4136
Portland 8, Oregon
MIRIAM KAUTTU SUHL, Editor
H. C. SMITH, Staff Artist

MEMBERS OF COMMISSION

John P. Amacher, Chairman.....Winchester
Rollin E. Bowles.....Portland
Max Wilson.....Joseph
Joseph W. Smith.....Klamath Falls
Tallant Greenough.....Coquille

ADMINISTRATIVE STAFF

P. W. Schneider.....Director
C. B. Walsh.....Assistant Director
John McKean.....Chief of Oper., Game Division
C. J. Campbell.....Chief of Oper., Fishery Division
R. C. Holloway.....Chief, Inf. and Educ.
H. J. Rayner.....Chief, Research Division
W. D. DeCew.....Controllor
John B. Dimick.....Chief, Supply and Property
William E. Pitney.....Chief, Basin Investigations
A. V. Meyers.....Chief, Lands Section
George Kernan.....Engineer
H. R. Newcomb.....Personnel Officer
Roy C. Atchison.....Attorney

REGIONAL SUPERVISORS

Leslie Zumwalt, Region I.....
Route 1, Box 325, Corvallis
J. W. Vaughn, Region II.....Box 577, Roseburg
L. M. Mathisen, Region III.....Parrell Road, Bend
W. H. Brown, Region IV.....Box 742, La Grande
W. V. Masson, Region V.....Box 8, Hines

Entered as second-class matter September 30, 1947, at the post office at Portland, Oregon, under the act of August 24, 1912.

Please report promptly any change of address. Send in address label from a recent issue with notice of change.

At the present time the Bulletin is circulated free of charge to anyone forwarding a written request.

the cover

Have you guessed just what the cover picture is? If not, read on. Ron Shay discusses it in the feature article. (Photo courtesy of Ivan Donaldson, U. S. Army Corps of Engineers)

BULLETIN HUNTER SAFETY TRAINING PROGRAM

Instructors Approved

Month of November..... 183
Total to Date..... 2,320

Students Trained

Month of November..... 1,669
Total to Date..... 15,456

Firearms Accidents Reported 1961

Fatal..... 11
Nonfatal..... 30

TWO NEW LAKES READY FOR FISHING NEXT YEAR

Two new man-made lakes were completed this fall and are to be stocked with fingerling trout.

Cottonwood Meadows reservoir, located on Cottonwood Creek about 22 miles southwest of Lakeview in the Fremont National Forest, will impound some 42 surface acres of water to an average depth of around 12 feet.

Bull Prairie reservoir in the Umatilla National Forest is situated at the headwaters of Wilson Creek, 45 miles south of Heppner. An impoundment of about 25 surface acres, it will provide trout fishery in an area where no other lakes exist.

The Game Commission bore the cost of construction of the two lakes built

1961 ANGLING RULES SET THIS MONTH

Final angling regulations for the current year will be adopted by the Oregon State Game Commission at its hearing on Friday, January 26, at its Portland headquarters, 1634 S. W. Alder Street. This session will be a continuation of the hearing started on January 12. At this first hearing the Commission formulates tentative regulations in regard to seasons, bag limits and methods of taking game fish but postpones for two weeks final consideration. Both sessions are open to the public.

The new regulations will be effective by Saturday, February 10.

solely for angling purposes. The U. S. Forest Service will provide camp grounds and other recreational facilities.

THE BALANCE OF NATURE

By Dave Mech*
PART I

MUCH HAS BEEN WRITTEN for and against the "Balance of Nature" theory, by both biologists and laymen. Most of the disagreement results from lack of definition. In the two parts of this article we see that over a long period and a large area, there is a natural equilibrium; reproduction versus mortality. When we see the mechanism behind this balance, our present hunting laws and wildlife management practices will be seen in a new light.

Nature is bountiful. If one pair of field mice and descendants bred unchecked for two years, the resulting mice, laid end to end, would stretch from New York to Los Angeles—and back; plus 25 times around the earth and 100 times to and from the moon! And there'd still be enough left to scare all the women in Pittsburgh and feed all their cats for a year.

An extreme example? Sure, but not as extreme as possible. A pair of houseflies breeding for one year under similar conditions could give rise to enough individuals to cover the entire surface of the earth by four feet!

Breed, breed, breed; wander, thirst, fight, starve—but breed! Every species becomes obsessed during the mating season. Why this heavy emphasis on reproduction?

Scientists tell us that the main force acting on the lives of all creatures is the

*Reprinted from *Pennsylvania Game News*, June, 1960.

drive to continue the species. Even the desire for self-preservation is just one of Nature's means to insure the survival of the race. Reproduction is the direct method for continuing the species, so it is especially stressed.

The details of breeding cycles vary considerably with different kinds of animals, but in each there are several insurances for success. The sex organs themselves are usually in pairs, so if one goes on the blink the other can take over. Early in the mating season males and females seek each other out. A powerful love scent discharged by female mammals lures males from long distance. Birds can't smell, but this doesn't cramp their style any. The resounding love notes of crooning males are sufficient advertisements to lonesome females. Thus, the cheerful melodies filling the spring air carry serious messages for the birds.

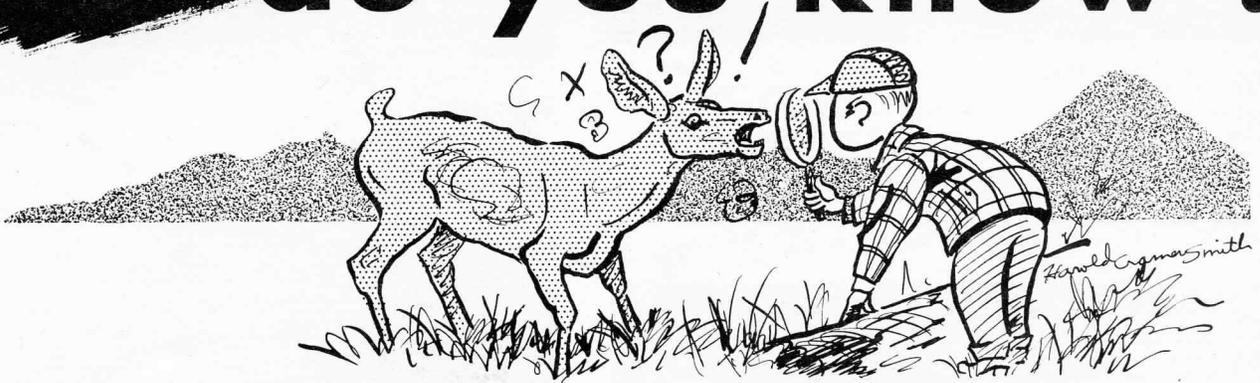
Males of most birds and mammals have competitors to dispose of before attending to their prizes. Much threatening and fighting occurs, and sometimes jealous males fight to the finish. The victor, presumably more fit, will get the female and give better qualities to the offspring.

The desire for the sex act itself is Nature's best insurance for continuing the species. While female birds and mammals are receptive, many matings occur, and each time over a billion sperm are shed.

It seems Nature is always experimenting with different ways of accomplishing

(Continued on Page 7)

How do you know?



By Ron Shay, Audio-Visual Supervisor

HAVE YOU EVER run into a representative of the Game Commission or Oregon State University asking if he can have the jaws from your deer, or perhaps the wings from that quail you shot? If you have and thought perhaps he was getting quite hard up for something to put in the stew pot, take note.

There are many different ways that biologists are able to determine the age and sex of various fish and game. Collecting parts of the animals is a segment of the program designed to either verify or eliminate some of the methods currently used for sexing and aging and to gain further information on our wildlife. Age determination of upland birds, for example, is important in the management of the species. The ratio of kill of young birds to adults gives an indication of annual production.

We are not attempting to show in this article all of the many techniques used. Some of the procedures are ones that do not lend themselves to presentation by photos. Others require much interpretation by persons doing the work regularly, and we certainly don't claim to be expert enough on the subject to try to explain the minute details involved in some of the methods. We have not gone into any of the various sexing and aging techniques used with waterfowl because this is a subject that would make an article in itself.

But now to talk a bit about what we have shown. As in all of nature, the points mentioned here are variable. Some individual animals and fish do not follow the pattern at all. This variation from the normal may be caused by the genetic make-up of the individual, the area in which it lives, or one or more of myriad other factors. In presenting the methods shown on pages 4, 5 and 6, we are indicating what has been found to be true of the majority of the individuals in the species discussed. Exceptions always exist.

We hope that these illustrations will give you a bit of an idea as to how certain facts are determined about a few of our birds, fish and game.

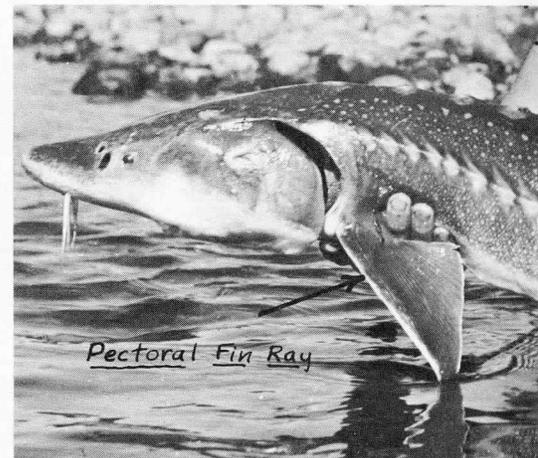
If you have larceny in your heart, you can use some of this knowledge to be sure you always get the young birds out of the pile taken by the party. If you've wondered why various parts of critters are collected, perhaps this will partially clear up your wonderment. Or if you're curious, perhaps this will serve as a stimulus to start you into fields of further inquiry regarding the species you hunt and fish. We hope at least the latter two statements apply.

In preparing this article we called on quite a number of persons, including naturally the staff specialists of the Commission. The deer jaws and bird wings were lent by the Fish and Game Depart-

ment of Oregon State University and the salmon scale photo by the U. S. Fish and Wildlife Service. To all those concerned, our thanks.

About the cover photo. It is a cross section view of the pectoral fin ray of a female white sturgeon. The fish was taken near The Dalles in August of 1951. Since the sturgeon has no true bony material internally, the fin ray is cartilaginous material. It is the main spine-like structure that supports the fin found just behind the gill opening at the rear of the fish's head. The ray puts on annual growth rings in the same manner a tree does. The rings on this ray show the age of the sturgeon to be 82 years.

(Continued on Page 4)



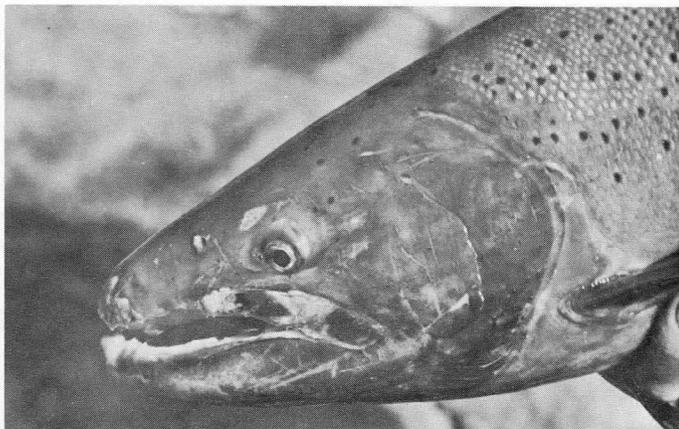


It is sometimes possible to tell externally if a fish is a male or female. In the case of the steelhead shown here or the resident form of rainbow, the difference in the head shapes is quite apparent. At the top is the female with a rather short snubby nose. Below, the male has a longer tapered snout and head. This will vary from fish to fish, but may often be seen in other species also. This characteristic is more pronounced as the fish approaches spawning time. During some times of the year, the head shape is virtually the same in the male and female.



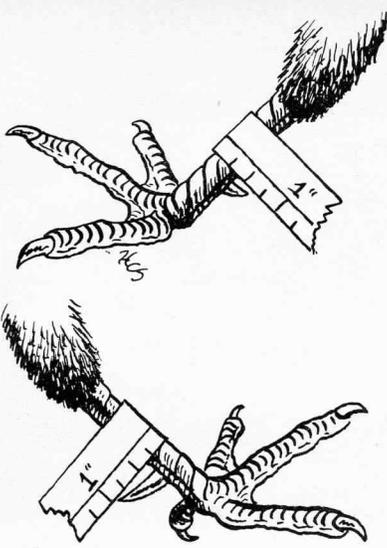
Fishes with bony skeletons such as the trout, salmon, and warm water species, reveal their age in their scales. Often it is not as clear as in this scale from a chinook salmon, and only a person well experienced in reading scales can accurately determine age.

This scale was from a male fish 48 inches long. The close-together rings near the center of the scale show the period the fish was in its home stream and growth was relatively slow. When he entered the ocean in his second year, growth was greatly accelerated. The annuli or growth rings that are counted are the areas where the rings are compressed or closer together. This is caused by the slowing of growth during the winter months. For reading purposes scales are mounted on glass slides and observed through various magnifying devices.



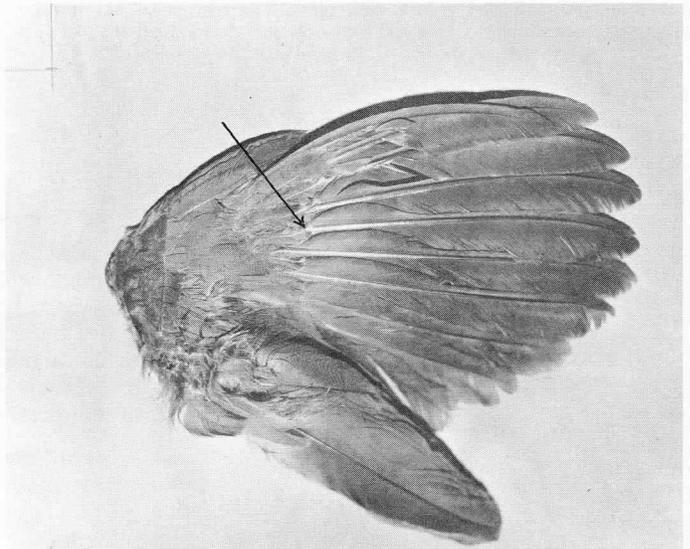
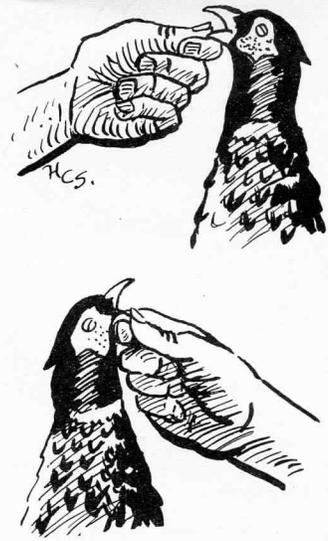
Wings of a juvenile (left) and an adult (right) mourning dove. Here the primary coverts reveal the difference. These feathers on the young bird have definite light tips. During the first fall of its life, the bird moults these feathers, and they are replaced by solid-colored feathers or ones

with a very slight light tinge. As with most characteristics of the feathers, this can vary considerably but has been found to be reliable in a high percentage of the birds examined.



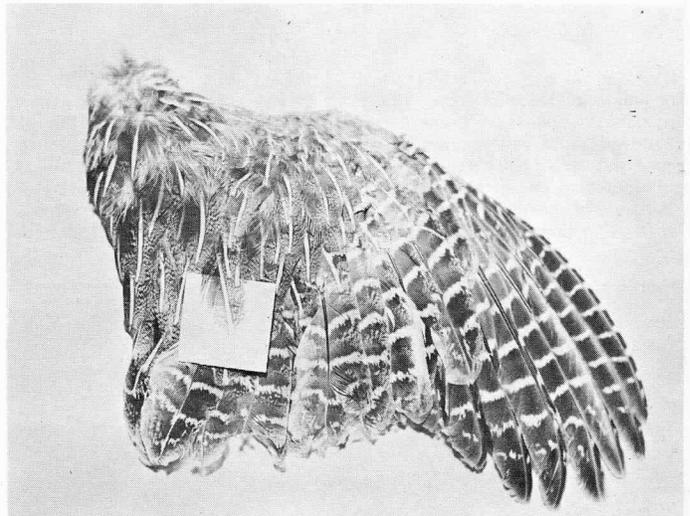
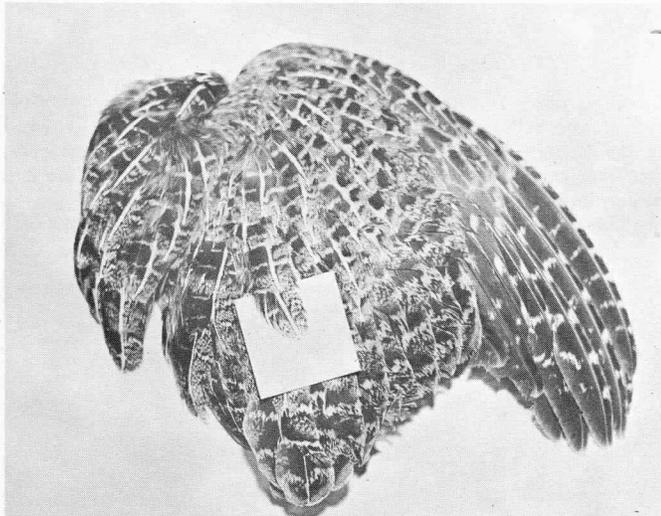
PHEASANT SKETCHES—In the fall of the year, rooster pheasants, hatched the preceding spring, usually can be distinguished from older birds by the spur length. Cocks having spurs less than $\frac{3}{4}$ -inch in length from the front of the leg to the end of the spur are "birds of the year." Spur length in excess of $\frac{3}{4}$ -inch indicates a mature bird more than a year old (bottom left).

In many areas the mandible test also will indicate the age of a bird. If an undressed bird of the year is gently suspended by the lower portion of the bill, his weight will break the bill. The lower bill will usually support the weight of the older birds. The reliability of this test varies somewhat according to the mineral content of the soil and also the bird's feeding habits.



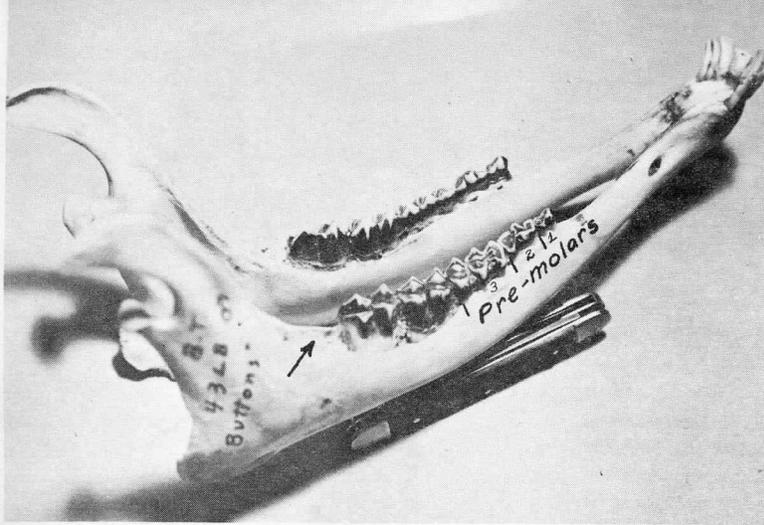
VALLEY QUAIL WINGS—Adult on left, juvenile on right. An age characteristic very similar to that in the doves is present. The primary coverts of the adult are solid-colored while those of the immature bird are light-

tipped, with light coloration even extending up the feather in some cases. Here again this changes during the first fall of the bird's life.

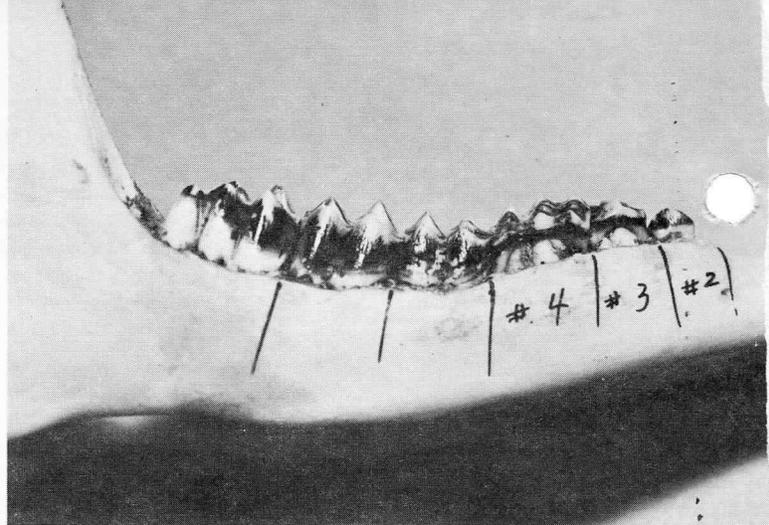


WINGS FROM HUNGARIAN PARTRIDGE—The marking on the seapular feathers is one of the most reliable of the plumage characteristics in birds. The female wing is on the left and the seapular feathers, in addition to having a light vertical strip, have a light colored crossbar or two. The

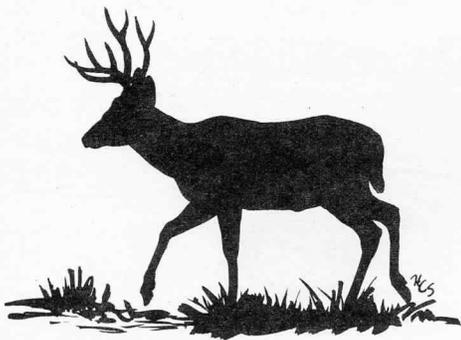
feathers of the male wing on the left lack the crossbarring. This marking characteristic coincides nicely with the scientific female symbol, which is Venus' hand mirror indicated thusly, ♀



This is the jaw of a fawn, 4 to 6 months of age. He has all temporary or milk incisors. They may be seen to be long and narrow. The third pre-molar has three ridges indicating it is a milk tooth. The rear molar has not yet erupted or grown through. This will come in just forward of the bend in the jaw at an age of 18 months to 2 years.



Jaw of an 18-month to 2-year-old animal. The incisors (not shown) are permanent. The permanent pre-molars are forcing out the milk pre-molars. This shows very well on the teeth numbered 4 and 3. It would soon occur with tooth number 2 also. The third molar is present in this jaw.



CONTRARY TO the belief of many, the age of a deer cannot be determined by the number of antler points. Many deer known to be six or seven years old will grow only one large fork. Antler growth is largely affected by the food supply available and the general condition of the deer.

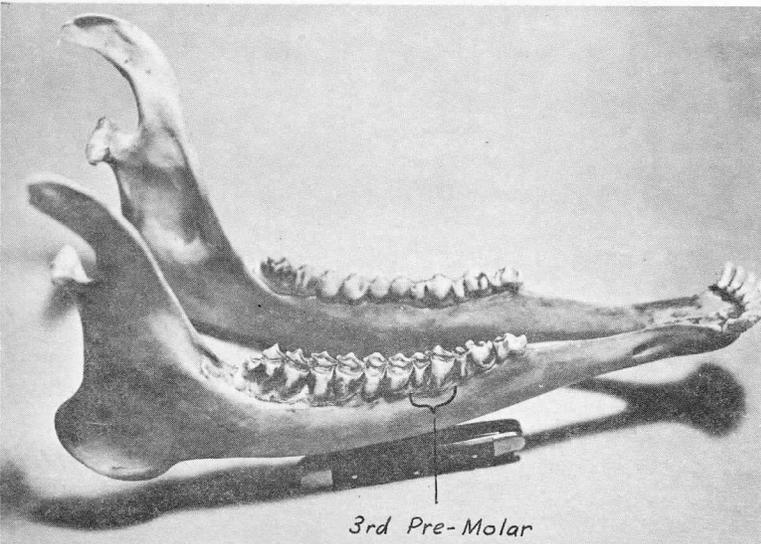
The most accurate method of determining age currently in use is the inspection of the teeth in the lower jaw. Since this method depends somewhat on the replacement of milk teeth, the lower jaw must be used since the upper jaw of a deer does not contain front or incisor teeth.

The examples shown here are ones with apparent aging characteristics. There will be many that fit in between these classes; also, ones that do not exactly fit the pattern. But again, the material shown here has been proven valid in the majority of the cases.

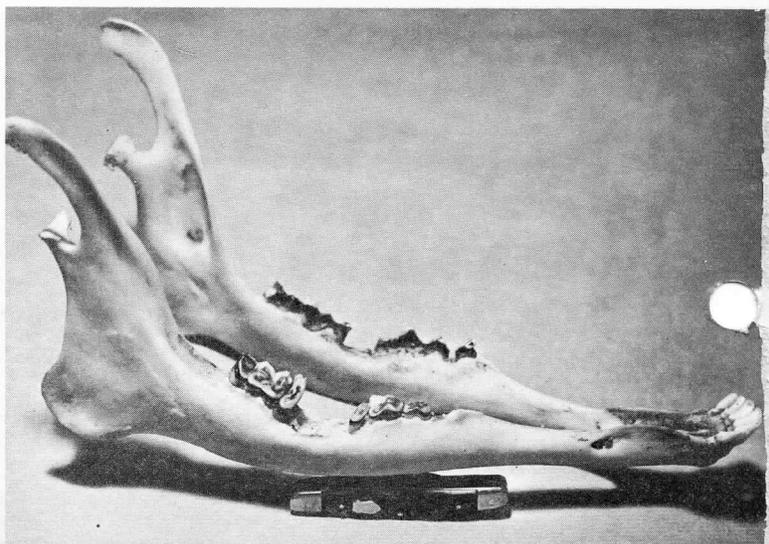
This method of aging hooved animals is nothing new since it has been used for many years on domestic livestock. Perhaps it took longer to apply it to game animals because of the difficulty in getting a deer or elk to stand still! Much work was necessary with tagged and penned animals in setting up the aging criteria.

A full mouth of an animal over two years of age. The pre-molars are now all permanent. The third pre-molar is 2-crowned as contrasted to the 3-crowned version of the younger animal. All incisors are permanent. Notice they are heavier, thicker teeth than the milk incisors. A slight amount of wear is indicated on them by the light areas along the top. The crowns of the molars and pre-molars are still quite sharp indicating the animal has not been using them very long. This correlates with the small amount of wear on the incisors.

A real old timer. Probably over 7 years old and tough too. This animal would have trouble getting enough food to survive. There is heavy wear apparent on the incisors, and they have assumed a rather flattened appearance as they were ground off back toward the roots. Some of the molars are missing entirely and the jaw bone has been eroded away. The molars and pre-molars that remain are extremely worn down, being much shorter than new ones and displaying no sharp ridges as in the previous examples.



3rd Pre-Molar



THE BALANCE OF NATURE

(Continued from Page 2)

the same thing. If one method fails, there are still others to succeed. For instance, in most mammals, sperm fertilize the eggs immediately after being shed, but in bats, which mate in fall, they are stored alive until spring when they unite with the eggs. An intricate mechanism then prepares the mother-to-be for nourishing and sheltering the embryos.

The "delayed fertilization" in bats is like another unusual type of reproduction occurring in several members of the weasel clan. It is called "delayed implantation" because the microscopic embryo decides to stop developing for many months (eight or nine in some species). Then suddenly in early spring it gets an urge and attaches or implants on the wall of the womb and develops normally.

An unorthodox method of birth is the living-abortion type of 'possums. Whereas most 'possum-sized animals develop inside their mother for about two months, the 'possum tad pokes his premature nose out after 13 days! The mouth and front legs are the only well developed parts of the critter. These are all he needs to promptly climb along his mother's fur for about six inches to the safety of her warm pouch. This cozy living room comes equipped with 13 handy milk dispensers to which the pre-'possums attach and resume their rudely interrupted development for several weeks.

Br'er 'possum is the only North American mammal with a built-in nest, however. Most others prepare their own non-portable dens or nests in sheltered, well hidden spots. Rabbits hide their nests so well, even on open lawns, that few people ever find them. Foxes, woodchucks, and skunks usually bear young in the safety of a deep burrow, whereas squirrels and 'coons generally take to hollow trees. Birds also use hollow trees and camouflaged nests in which to deposit eggs.

Generally, the less helpless that animals are at birth or hatching, the less carefully constructed the dens or nests are. For example, the snowshoe hare can run and hop within a few hours after birth, so it has no nest. But, cottontail rabbits, mice, and squirrels must build warm nests, for their young are blind, naked, and helpless at birth. Grouse, pheasants, and ducks are far from helpless when hatched. They leave their loose nests immediately after drying. When 14 days old, the grouse and pheasant chicks can actually fly, and the ducklings can swim and dive expertly. All of which tends to provide for continuing the species.

Since with some animals there are

more chances for the results of various provisions to be overcome, these species produce several young per litter or brood and many litters or broods each year. Our prolific acquaintance of the first paragraph—the field mouse—averages five young in each of its possible 17 litters per year; its first daughters can still have 13 litters that same year! Thus, the possibility exists of that exceedingly long line of descendants which in two years would total 500 billion if none died.

Our most important small game animal, the cottontail rabbit, has an average of 12 to 15 young per year. If all these and their progeny lived and bred unchecked, in five years they could stock six townships with one rabbit per acre. There is truth in the rumor about rabbits!

Birds also produce large numbers of young. Grouse and pheasants average 12 eggs per clutch. If a clutch is destroyed before completion, the bird renests and lays more eggs. Some biologist once pulled a dirty trick on a woodpecker to discover how many eggs she could lay. He stole an egg from her incomplete clutch; she laid another. The villain continued swiping an egg a day, and the bird kept laying an egg a day. After 71 days of egg-stealing antics, the scientist finally admitted defeat. The bird completed her clutch and presumably lived happily ever after.

Compared to the multitudes of young produced by most plant-and-insect-eating animals, the young of meat-eaters are few. Porcupines and moles also produce few young for reasons we shall see in the next article. Nevertheless, even their low breeding rate is more than high enough to perpetuate the species.

Young are aggressively defended by one or both parents for several weeks, or even months in larger animals. Many species are also outfitted with special protective mechanisms or behavior. Fawns, for instance, supposedly have no odor during their first few days when they are left alone while their mother browses. The famous broken-wing act of grouse and other birds is also quite effective. As soon as danger is discovered, Ma Grouse gives the "freeze" signal. Instantly the young become part of the landscape. If the enemy continues toward the brood, a "scatter" call is given. The defending mother runs, hops, and half flies, dragging her "broken" wing and attracting the predator to her. When far enough from the brood, the valiant actress flies off, leaving the predator hungry. Meanwhile, the chicks scoot under leaves, herbs, and low branches where they disappear. I've often stood in the midst of such an

(Continued on Page 8)



The last of the waterfowl seasons, for black brant, closes on Tuesday, January 30. Bag limit for brant is three a day or in possession. The season for ducks, geese, coot and mergansers closed on January 3.

Ten mountain sheep were seen this winter on the east face of the Steens Mountain. These were sheep that had been transplanted previously from the Hart Mountain holding area.

There will be 13,000 additional acres of land open to hunting in Morrow and Umatilla Counties as the result of initiation of habitat improvement projects on lands of eight cooperators.

Fur prices are comparable to those of last year, but trappers have been slow to apply for licenses. By the end of November only 700 trapping licenses and 5,800 beaver tags had been issued.

The 1961 success of elk hunters may exceed 1960's record harvest of 10,856 animals according to preliminary reports.

The North Umpqua River this past season had one of the four largest summer steelhead runs since counting on the river began in 1946. The count at Winchester dam was 3,141 fish. Marked hatchery fish made up 24 per cent of the steelhead counted.

An estimated 916 summer steelhead were taken from the stream by approximately 3,831 anglers in 1961. About 25 per cent of the fish caught were returning marked hatchery fish.

Spawning operations at East and Big Lava Lakes this winter provided approximately 4 million eastern brook eggs of excellent quality.

Preliminary examination of Diamond Lake creel data indicates that about 40,000 anglers caught about 40,000 trout at the lake last summer.

THE BALANCE OF NATURE

(Continued from Page 7)

invisible brood, and once I spotted a chick and picked it up. As it cheeped loudly, its parent came up to within two feet of me, hissing and uttering all kinds of dirty threats till I released her precious youngster.

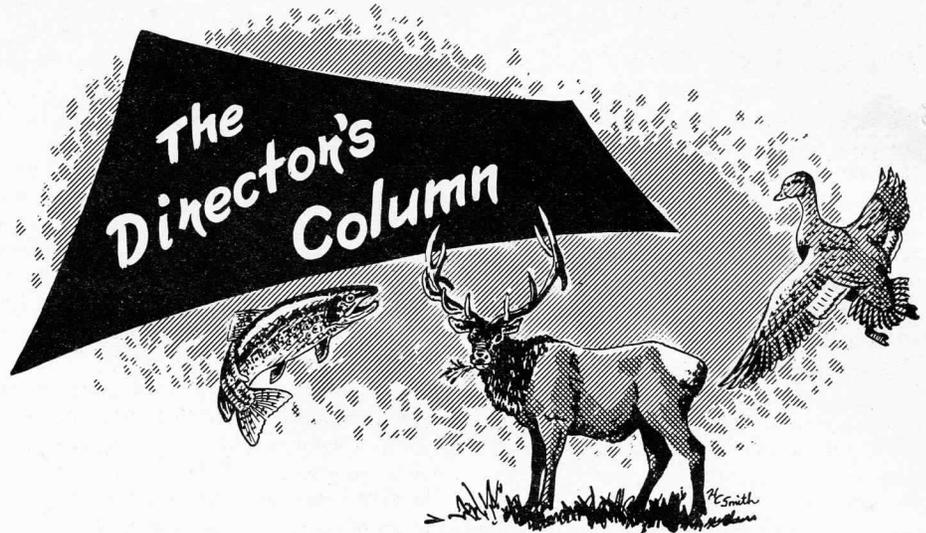
Gradually the myriads of growing animals leave their parent's care and set out to seek their fortune. Some don't venture very far, but others cover miles. The effect is the same either way; usually all good and some poor habitat in the broad vicinity of the breeding stock becomes temporarily oversaturated. Whenever there is food and cover for a certain number of any species, that number (and then some) is usually there by the end of summer. Nature's insurances have paid off.

Although this overstocking occurs annually wherever animals occur in good habitat, the surplus is quickly weeded out. It is therefore hard to realize that such a great breeding potential exists. But, when a species is put in a favorable area previously unoccupied by that animal, much more of the breeding potential is realized. Then we can actually see how great the reproductive force is. In 1859, twenty-four European rabbits were introduced into Australia, and six years later these became 30,000. Eventually in one decade, 700 million animals were killed for skins.

The same thing happened on Pelee Island in Lake Erie after 36 pheasants were liberated there in 1927. Seven years later the annual kill was 10,000 birds.

Even moose can reproduce astoundingly fast. About 1912, a few individuals crossed the Lake Superior ice to Isle Royale (now a national park). No one knows how many ventured across the 17-mile stretch, but usually only two or three individuals travel together during winter. By the early 'thirties, these few animals had multiplied to an estimated 1,000 to 3,000 on this 210-square-mile island.

The reproductive ability of deer was shown in a fenced-in area of southern Michigan. In 1928, four does and two bucks were liberated on the 1,200-acre area. Five years later, there were at least 160 individuals. For the next 14 years, an average of 42 deer per year was harvested without hurting the breeding stock.



IN TAKING a broader look at the status of our fish and wildlife resources and some of their urgent management problems, we must recognize certain basic principles.

First, fish and game are renewable natural resources which arise as one of the values in our land and water base. This is a fundamental precept in a permanent management program. In many instances fish and game resources are not the primary use but are by-products of other land uses. This situation poses one of the most interesting challenges in the resource field—the task of correlating a program to produce fish and game with other land and water uses. Often serious conflicts arise, requiring positive coordination with the farmer and rancher, the water user and other innumerable demands of man which influence the prevailing character of our land and water areas.

Second, fish and game rest in a unique legal status of public ownership, fortified by laws and judicial treatment reaching back to colonial times. These resources belong to all the people, and the State, except for migratory birds, is simply the trustee charged with providing a regulated use of the resource to assure its perpetuation. This legal status creates many interesting problems as our state

A famous saying in biological circles is that each species seems to try to fill the earth with animals of its own kind. We've seen that each species could.

"But," asks the hunter logically, "where

is developed and the population increases.

Third, it is impossible to manage one renewable resource, such as fish and game, without considering as well other resources and man's activities because of their inter-relationships.

Fourth, because of the direct relationship of population densities of given game species to habitat requirements, both as to quality and quantity, there are levels of abundance which cannot be exceeded. These wild species cannot be stockpiled ad infinitum. They must be fully utilized under the principle of sustained yield or waste will occur.

Management of fish and game has passed through an evolution during the past quarter century, based pretty much upon the development of these principles. During the course of this evolution, there have been temporary emphases placed upon inviolate protection, predator control, law enforcement, artificial propagation, habitat improvement, scientific investigations, conservation education, and so on. Each in itself is not the panacea for abundant fish and game stocks. On the contrary, each of these activities and others make up a mosaic of necessary activities needed in a balanced program to achieve the final objective of maximum annual yields of these desired resources.

- - P. W. Schneider

are all these critters during hunting season?"

This we shall see in the second part of this article—Wildlife Mortality (to be published in a future issue of the Bulletin).

Oregon State Game Commission Bulletin

1634 S. W. ALDER STREET
P. O. BOX 4136
PORTLAND 8, OREGON

