

# **OREGON WILDLIFE**

*FEBRUARY 1980*

# OREGON WILDLIFE

FEBRUARY 1980

Volume 35, No. 2

## OREGON FISH AND WILDLIFE COMMISSION

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**Cover** — Seen through the microscope a fish scale can tell the manager a lot about this bass including age and growth rate. More about management of warm-water fish species will be found in Ray Temple's article.

*Photo by Bob Kuhn*

HUNTER EDUCATION PROGRAM	
INSTRUCTORS APPROVED	
Month of December . . . . .	9
Total Active . . . . .	1,719
STUDENTS TRAINED	
Month of December . . . . .	169
Total to Date . . . . .	270,780
HUNTING CASUALTIES REPORTED IN 1979	
Fatal . . . . .	3
Nonfatal . . . . .	36

## A TIME FOR CONSIDERATION

Although we suspect most everyone has noticed, we remind that winter is here. It has been cold and snowy in most parts of the state and the odds are that we will get more of that sort of thing before the spring thaws come along. As we write this, the reports concerning big game on the winter ranges are good, but the animals have a long way to go before the new supply of food starts being generated by spring growth.

This means that from now on out is a time for consideration toward wildlife. As winter wears on, all of the various species living outdoors will probably become weaker and have less body reserves left to get them through to spring. The closer spring gets, the worse the condition can be and any undue strain may mean the difference between life and death.

There is no question that death is part of wildlife's way of life and nature uses the winter months in our area to cull her crop of surplus creatures that were born earlier. However, man's activities can cause an undue amount of death to take place. Autumn hunting seasons are set on a few species to allow an orderly take and utilization of a portion of the surplus. Despite this nature takes some 70 percent of most birds from the population and varying numbers of large and small animals.

This is where consideration comes in. Winter is a good time to observe and take pictures of wildlife. Most creatures are less active and many are easily attracted to food. It is critical that such observation not cause the animals to have to put out extra energy getting away from the observer. Domestic cats and dogs allowed to roam free are a completely unnecessary threat to birds and animals. The free-roaming pets kill directly and cause further death by chasing the wildlife thus causing undue expenditures of energy. When the domestic cat or dog tires, it returns to the warm hearth and free handout of food . . . the wild creatures simply don't have this luxury. Tabby and Rover are effective killers of wildlife weakened by the winter. The pets are doing what comes naturally, however their owners could show consideration by restraining their wanderings.

Wanderings of snowmobilers, off road vehicle users and other recreationists can also be significant to stressed wildlife. Although there have been reports of abuse such as snowmobilers who run down animals on purpose, few recreationists intentionally harass wildlife. However, just the disturbance of vehicles and people moving through winter ranges where weakened deer are congregated can be enough to cause some of the animals not to make it through the winter.

Winter indeed is a time for consideration if you care about wildlife. Observe, photograph, appreciate, but don't harass.□

R.E.S.

## COMMISSION MEETINGS

*The Fish and Wildlife Commission will conduct a general business meeting beginning at 9 a.m. on Friday, February 22 at Fish and Wildlife Department headquarters, 506 SW Mill Street in Portland. Among the agenda items are bear hunting and pursuit regulations, falconry rules and a review of 1980 angling regulations on the North Umpqua and the North Fork of the Middle Fork Willamette River.□*





The setline is one means biologists use to sample channel catfish. In this case a squawfish has been captured.

## WARM-WATER FISH MANAGEMENT IN OREGON

by  
*Ray Temple, Warm-Water Biologist*

Most of our warm-water game fishes (basses, sunfishes, catfishes, perch, walleyes) came to Oregon in the late 19th and early 20th centuries from the midwest. By 1950, both the resource and the anglers who sought them had increased to a level which warranted specialized attention. In March of that year, the Department's first warm-water biologist position was established in Salem. In 1972 the position was changed to provide representation on the Portland staff, and a field position was added in 1977.

Although only two biologists are assigned full time to warm-water fish management, all of the Department's 23 fishery districts have warm-water species and biologists who manage them. The warm-water staff biologists provide coordination and assistance to the districts, and operate the St. Paul Rearing Ponds and St. Louis **OREGON WILDLIFE**

fishing area.

Inventory of the fish resource is a time consuming, but necessary, part of management. "Inventory" is the general term for gathering information about fish populations, whether by nets, traps, electrofishing, or other sampling gear, or by checking anglers. Since whole populations cannot be observed, representative samples must be obtained and judgments as to the abundance, species composition, growth rates, etc., are based on those samples. This information is the foundation of other management activities.

The gill net is the most commonly used net for inventory due to its ease of transport and handling, and because it can be set almost anywhere. Trap nets are much larger and more limited in the areas in which they can be fished, but are especially effective for live capture of the sunfishes and

catfishes. Trap nets are commonly used to obtain crappie for transfer to other waters. Seines are used in shallow ponds which have relatively snag-free bottoms and in pools in streams. These nets provide adequate inventory capability for perch, crappie, bluegills, and catfishes.

In 1977 a boat-mounted electrofisher was acquired to extend our sampling ability to largemouth and smallmouth bass. The electrofisher creates an electric field which stuns fish and compels them to swim toward the boat, where they can be netted. The fish revive in a minute or so and can be measured, tagged, or otherwise processed before being returned to the water. No bass have been killed in three years of sampling with the electrofisher.

The best inventory "picture" of populations is obtained by use of all these techniques, since each has its



Fairly new to the warm-water fish management scene, electrofishing equipment provides an excellent method for sampling fish populations. An electric current stuns fish but causes no permanent damage.



For some species the gill net provides the best means of checking fish populations, their growth rates and age class distribution.

own peculiar fish-catching characteristics. In practice, sampling is often limited to nets or electrofishing due to availability of equipment or physical restrictions on access.

The more important waters are sampled annually, and most others are sampled every second or third year. However, many waters have not been sampled for several years due to limits on time and manpower.

The electrofisher is fairly new to the scene in Oregon and attracts considerable interest among the public. It has allowed us to collect previously unattainable data on bass populations in both standing and flowing waters, and to undertake some specialized inventory projects. One of those is the annual survey of young-of-the-year bass ("zero-age" bass) which began in 1978. By sampling the same shoreline sections annually in selected lakes and rivers, variations in bass production are measured. These observations should help explain some of the variation in bass abundance and angler catch from year to year.

During inventory, scales are often taken for later analysis. From the scales, useful information about total age and growth during each year of life can be obtained. Since fish size at any age is highly variable from one population to another, scales provide the best means of determining whether fish are growing normally.

Information about fishes caught by anglers is collected through creel census. In some cases this source provides all the information available in waters which have not been netted or electrofished. With growth of bass clubs and tournament angling, another source of creel data has emerged. Major tournaments are monitored by Department biologists and the clubs maintain records of intra-club events. Organized warm-water anglers have provided much information as well as money, and labor to the warm-water fish program in the past several years.

A second major facet of the program is the rearing and distribution of warm-water fishes. Most fish are stocked in barren waters or waters in which existing undesirable fish populations have been chemically eliminated to create new fishing opportunities. The sunfishes are so prolific as

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to seldom, if ever, need additional stocking after initial introductions. Bass are both prolific and predaceous, such that fingerlings stocked in the face of an established population show poor survival. Channel catfish in western Oregon are stocked supplementally since they seldom spawn.

Combinations of species to be stocked in various waters are determined from experimentation, review of professional literature, and experience. The number and size of each species, and the order and timing of releases are very important to successful introductions. These planned introductions can be upset by well-meaning but thoughtless (and illegal) stocking by the public. Illegal introductions needlessly complicate the already complex business of establishing and maintaining fisheries. If there are questions or suggestions regarding fish stocking, the district fish biologist can help. (There are 23 distributed throughout the state).

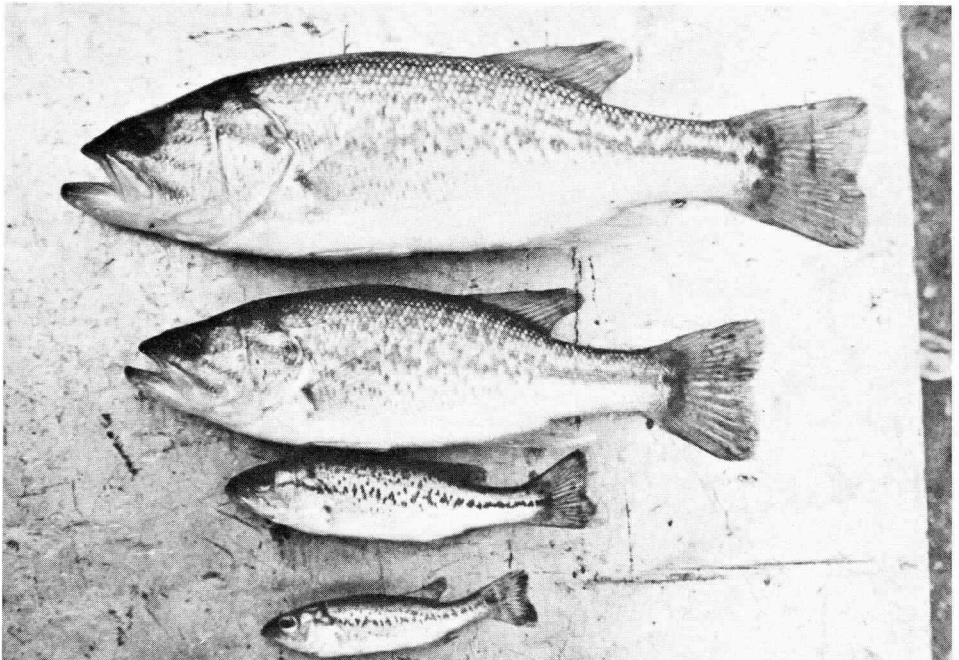
The St. Paul Rearing Ponds, located in the Willamette Valley north of Salem, are the focal point of warm-water fish culture in Oregon. Large-mouth bass, channel catfish, black crappie, and redear sunfish are routinely reared there, and other species as needed. Bass fry are collected from nearby ponds and sloughs in May and June at a size of 2,000-3,000 per pound. After 4 months in fertilized ponds, they reach about a size of 2½ to 3½ inches, the size at which they are liberated in late fall. Channel catfish fry at 10,000-16,000 per pound are shipped from a California Department of Fish and Game hatchery in southern California in June. By late fall they are about 4-5 inches long. Bass production in 1979 was over 21,000 fingerlings. The recovery of 1979 channel catfish is not yet complete; over 19,000 were reared in 1978.

Adult redear sunfish were obtained from California in March, 1979 for evaluation as an alternative to bluegill in pond stocking with bass. Both redears and crappie fingerlings are produced by natural spawning of adults in fertilized ponds.

Fish from the St. Paul Ponds are stocked statewide, along with fishes from private ponds and those captured from public waters. Since in-



St. Paul Ponds are currently the Department's only warm-water fish rearing facilities. Fingerlings of some species are grown here. Fry from other species are dipnetted from the wild.

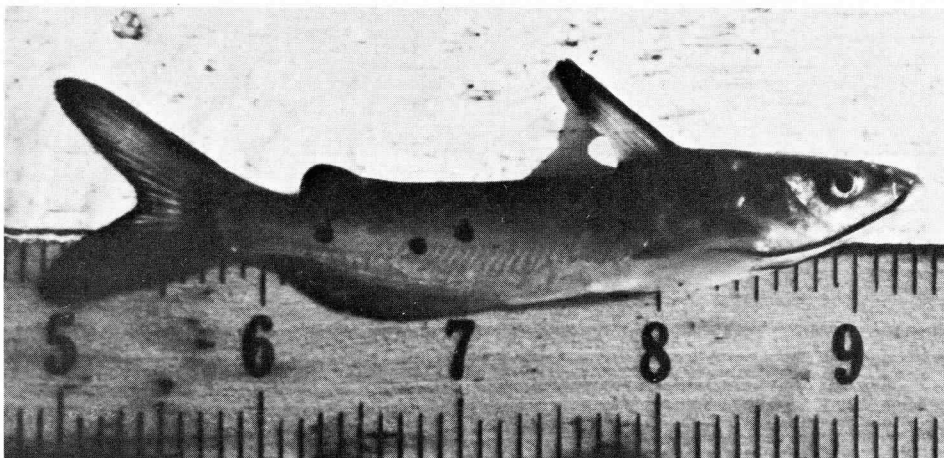


Growth rate of the aggressive largemouth bass varies considerably. These are all five-month-old bass from St. Paul Ponds, ranging in size from 2.3 to 6.8 inches. The big ones eat the smaller ones.

ception of the program in 1950, private ponds have been used for fish production under formal agreement with pond owners. Bluegills and white crappies are usually not reared because they are readily available from wild populations. Black crappies and bass are also transferred from wild stock when adults are needed or fingerlings are not avail-

able. In any case, the number of fish removed presents no impact on fishing in those waters.

With growing awareness of diminishing angling opportunities and mounting pressure on the limited salmonid resources, interest in warm-water fishes has steadily increased. The Department's last angler survey indicated that warm-water anglers in



A typical five-month-old channel catfish fingerling reared at St. Paul Ponds.



Tagging provides information about fish growth in various waters and about their movements when tagged fish are caught later by anglers or inquisitive biologists.

1977 expended about 10.3% of the total angler days that year, compared to about 9.5% for steelheaders.

The Department is using several avenues to provide increased angling opportunities. One approach is to start new fish populations in formerly unstocked waters, as previously mentioned. Another related approach is to introduce desirable species in populated waters having ecological "room" for them. Examples are the introduction of smallmouth bass in the John Day River and the introduction of channel catfish in western Oregon in 1962-63 and during 1977-78.

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Acquisition of public access to private waters was greatly aided by the last legislature, which extended an existing statute which limits landowner liability to include borrow pits opened to public angling. That action will make acquisition of public access to some of the many unused borrow pits easier in Oregon. These pits are often suitable for warm-water fishes, especially with the addition of underwater habitat structures. Several Highway Division borrow pits have already been developed for angling in past years. Most of these are located in the Willamette Valley along the freeway between Eugene and Wilsonville.

The Department is developing a major warm-water fishing area on its property near St. Louis, between Salem and Portland. Seven ponds specifically designed for warm-water angling have been stocked with various combinations of largemouth bass, white crappie, black crappie, bluegills, green sunfish, and channel catfish. The area was opened to angling for the first time on January 1 and drew about 100 anglers. Heavy use is expected when weather and water warm.

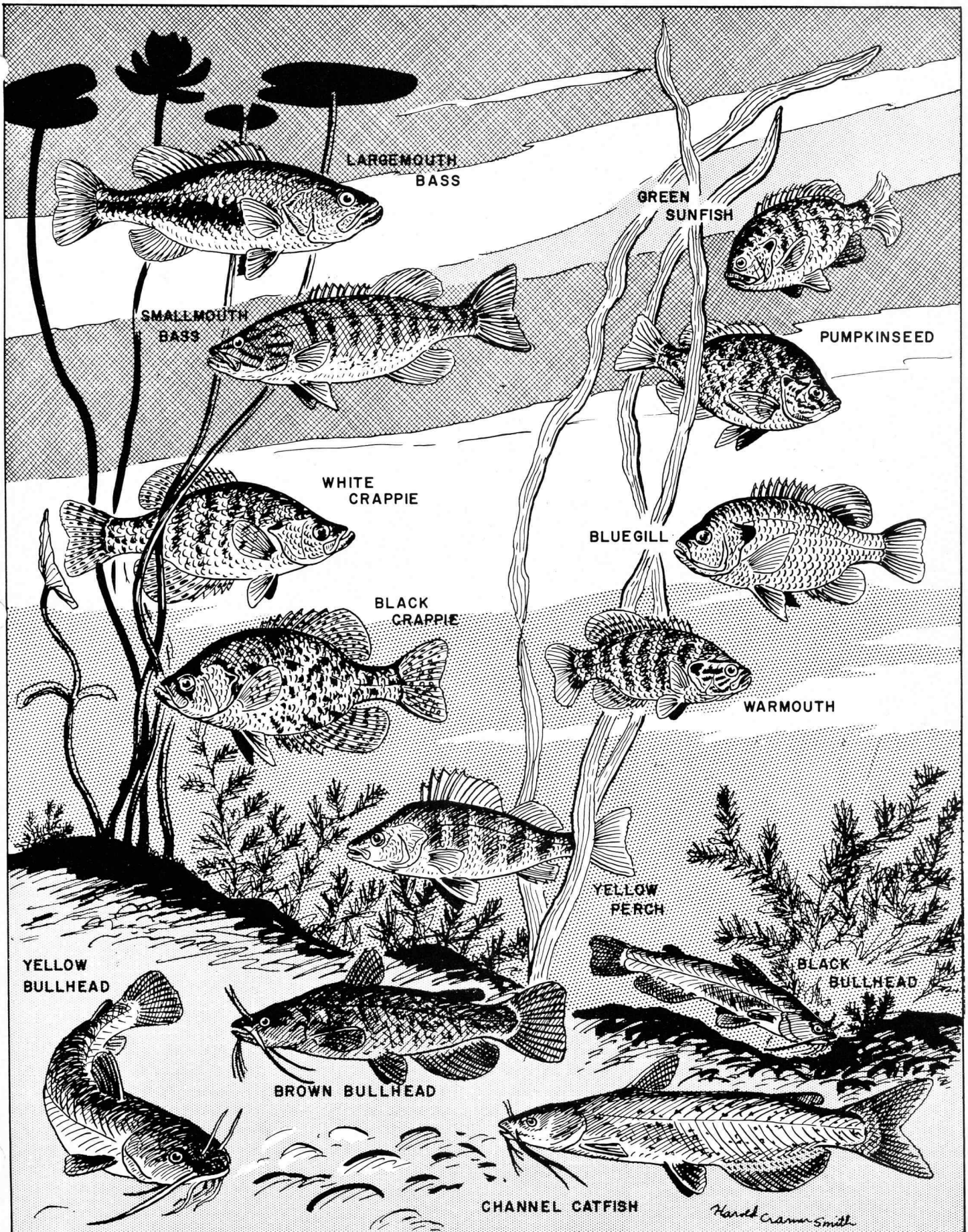
The Department receives numerous requests from individuals who have constructed farm ponds and want to know about having them stocked with warm-water fish. The Department is happy to stock private ponds with fish if the landowner agrees to allow angling by the general public or is willing to sign a cooperative agreement with the Department for the use of the pond.

If the owner of a private pond prefers not to allow public angling he may obtain warm-water fish species from the wild using normal sport fishing methods and in compliance with bag and size limits where applicable. If he does this he must obtain a free permit from the Department to transport live fish. There are a few private hatcheries in the state that sell bass and some bluegill for stocking by private pond owners. District biologists can provide advice concerning private stocking endeavors.

What does the future hold for warm-water fish and fishing in Oregon? Undoubtedly, harvest and demand for the basses and channel catfish will increase greatly and new regulations will be necessary. There are untapped angling opportunities for the panfishes, but not always near population centers. More borrow pits managed for warm-water fishes, perhaps some modifications in fish stocking policies, and certainly more emphasis on research and management are in the future.□

Shown on the facing page are Oregon's warm-water species minus two fairly recent imports. Missing are the walleye which as gradually worked its way down the Columbia River into pools above The Dalles Dam, and the redear sunfish brought in last year from California.





# THE CONTROVERSIAL OPI

*prepared by anadromous fish staff*

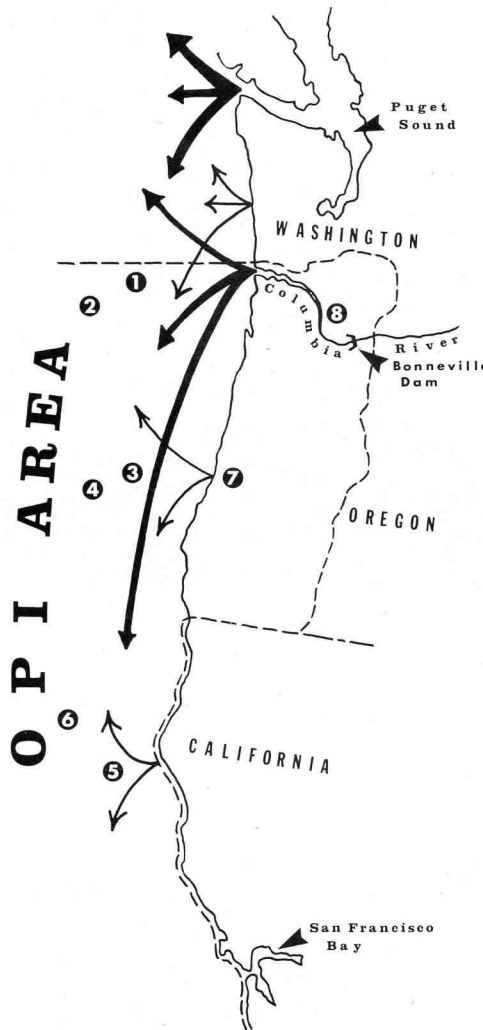
If you fish for coho salmon, or have friends who do, you may have heard about the Oregon Production Index. It gained attention in the fall of 1979 when it was used as the basis for closing Oregon's coastal coho fisheries. There is nothing mysterious or magic about the OPI once you know what it is and how it is used.

As the name implies, OPI is an index. It has been used as a management tool by Oregon biologists since the late 1960's, although it was not known as the OPI until recently. The OPI was developed as an indicator of the annual abundance of coho for use in predicting the size of the coho run entering the Columbia River. Run size was important for formulating recommendations for the river gill-net fishery.

Gradually, the OPI was refined and with it the ability to predict abundance of coho in the river and offshore became more accurate. At present the OPI is used as a measure of the annual abundance of adult three-year-old coho salmon resulting from production in Columbia River and Oregon coastal hatcheries and streams.

The index itself is simply the combined number of adult coho that can be accounted for within the general area from south of Ilwaco, Washington to as far south as coho are found. More specifically, it is the sum of 1) ocean sport and troll catches off the Columbia River, Oregon, and California; 2) Oregon coastal hatchery returns; and 3) the gill-net catch, Bonneville Dam counts, and hatchery returns to the Columbia River below Bonneville Dam. The first illustration shows the OPI area and the catch and count values making up the OPI in 1979.

The controversy over the OPI occurs because biologists are predicting fish numbers one year in advance, and are using this prediction as the basis for recommending changes in regulations. The concern about the



O. P. I. COMPONENTS		1979 VALUES (1000'S of COHO)
①	Ilwaco, Wn. Ocean Sport	122
②	" " " Troll	118
③	Oregon Ocean Sport	176
④	" " Troll	714
⑤	California Ocean Sport	16
⑥	" " Troll	160
⑦	Ocean Coastal Hatchery Returns	
⑧	Columbia River Gillnet Catch	123
	Dam Counts	31
	Hatchery Returns	102
TOTAL OPI		1584

OPI is twofold: 1) Is it an accurate measure of abundance of coho originating from the Columbia River and Oregon coastal streams? 2) Is the OPI prediction accurate?

## Is the OPI a Good Index of Abundance?

Coho production as measured by the OPI does not represent only those adults originating in Columbia River and Oregon coastal streams, because this is not practical. Upon entering the ocean, salmon migrate widely although they do appear to follow definite migration routes. Most coho originating from streams

in the OPI area enter ocean fisheries south of the Columbia River, but some migrate north off the Washington coast.

Conversely, most coho originating from Puget Sound and Washington coastal streams enter the ocean fisheries off Washington, but some are taken off Oregon and Canada. Oregon index coho caught off the Washington coast are not included in the OPI, but Washington stocks caught in the OPI area are included.

This interchange of migrating coho stocks within the ocean does not itself affect the accuracy of the OPI, unless the extent of interchange

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varies appreciably from year to year. The fact that it probably does vary introduces some error. An estimate of the degree of interchange could be made based on an evaluation of the ocean recoveries of tagged fish, but at present this estimate would be rough and not available until well after the season's end. Factors affecting the balance of coho between the Oregon and the Washington production index areas such as survival and ocean currents are not fully understood. They certainly are not predictable at this time.

Coho that return to streams and spawn naturally are excluded from the OPI, because it is not practical to obtain an accurate estimate of their abundance. For example, they spawn in over 6,000 miles of stream on the Oregon coast alone, and they enter these streams over a period of several months. This population is believed to be about 50,000-75,000 adults in recent years. Their exclusion does not affect the accuracy of the predictor as long as the proportion of natural spawners does not change.

Some error is introduced because this proportion does change. This proportion varies as the percentage of fish escaping the fishery changes, and as the ratio in numbers between wild and hatchery fish changes. However, because the number of wild spawners is a relatively small part of the total OPI (about 5%) the amount of error introduced is small.

#### Is the OPI Prediction Accurate?

The number of three-year-old adult coho in the OPI is predicted by the number of two-year-old jack coho returning to selected facilities in the previous year. Both groups are mainly from the same parents and broods and consequently are exposed to the same freshwater and ocean conditions up to the time the jacks return to fresh water. The assumption is that three-year-old fish will return in the same proportion as two-year-old fish. This isn't the case for all species, but for coho it is generally true. Further, if the prediction is to be accurate it is essential to obtain a count of coho jacks.

The current predictor compares the number of coho jacks returning

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to selected hatcheries and dams with the catches and returns previously described as making up the OPI. Not all hatcheries are included in the jack indicator because jacks escape through the pickets at some hatcheries and are not counted at others. It is not important that not all jacks are included. It is important that the jacks which are included accurately represent the jack escapement and a proper ratio is used. The accuracy of the predictor used by the staff is best indicated in the accompanying figure which shows the predicted and actual sizes of the OPI for individual years.

The reason this predictor works as well as it does is because more than half of the OPI production is from the Columbia River. Since about 90% of the Columbia River coho are from hatcheries, most of the jacks and adults of Columbia River origin return to points where they can be recovered and included in the OPI and jack predictor.

The predictor's value is primarily

in its accuracy to forecast whether production will be good, mediocre, or poor. It is much more important in managing the resource to know this than to know if production will be an average bad year or a below average bad year. In both instances the production is still bad with a similar need for regulating the fisheries.

Criticism in 1979 focused on the issue that the Oregon staff estimated the OPI at 1.3 million fish when, in fact, it was 1.6 million fish. After the dust had settled, the OPI ended up being the second lowest since Oregon's expanding hatchery coho program began in the early 1960's. Even though better than predicted, it was still a bad production year.

The OPI and its predictor can be made more accurate. Constructive suggestions have been offered by concerned fishermen, and the staff has been actively working on refinements to improve both the predictor and what is or is not included in the OPI.□

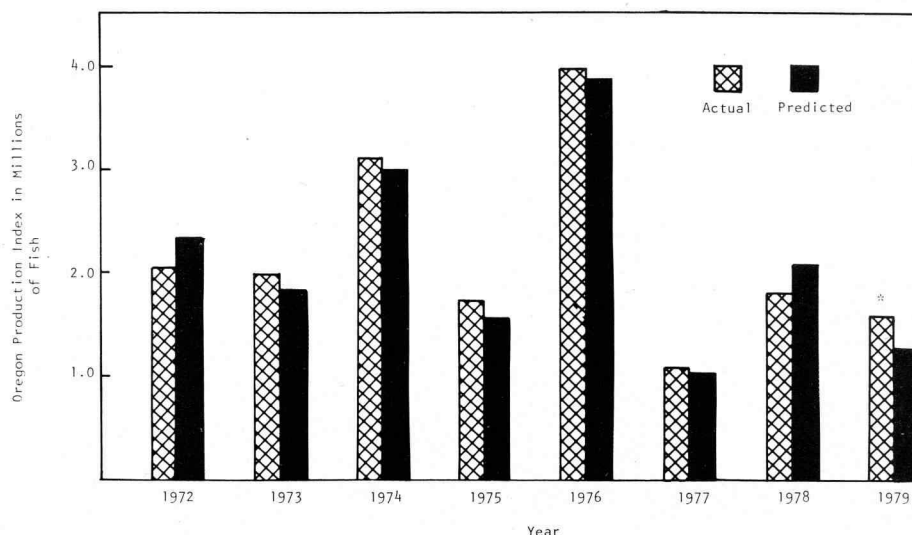
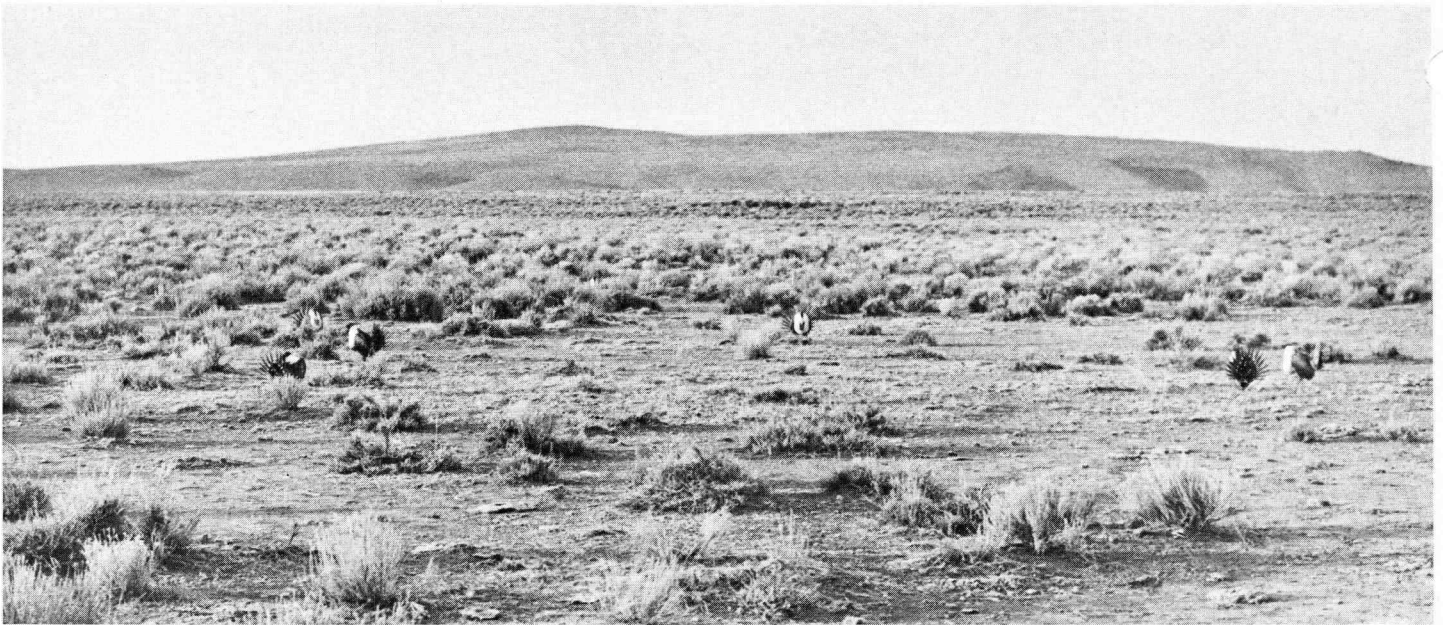


Figure 2. Comparison of the Actual Oregon Coho Adult Production Index (OPI) with the Value Predicted from Jack Counts, 1972-79

\* Preliminary.



The sage grouse is truly at home on the range. The birds seem to prefer flat, open spaces in the sage for the strutting ritual. The grounds are traditional and may be used for

generations. This consistency leaves the birds vulnerable to human disturbance.

## Strutters Of The Sage

At first, one can only hear them. The sound is that of swishing air followed by a deep, liquid "pop". As the sun adds more light to the eastern sky a dozen or more male sage grouse are seen. They are calling for a mate.

Every spring for many thousands of years this grouse has strutted and

"boomed" to perpetuate its kind.

As the name implies, sage grouse are creatures of sagebrush country. They are found throughout the lower two-thirds of eastern Oregon and in similar habitat throughout the western U.S. In March and early April the males gather on traditional strutting grounds and begin their displays.

The sage grouse is just one of several species found in Oregon. Most members of this bird group are known for interesting courtship activities. The sage grouse, weighing in at six pounds during breeding season, is definitely the largest of Oregon's grouse.

The display consists of a strutting gait, chest outthrust, with the pointed and contrasting tailfeathers fanned out behind. The distinctive sound effects are provided by two yellow air sacs on the white, feathered chest of the male bird. These sacs are inflated by sudden intakes of air, then the air is released quickly creating the "pop". In Oregon, as many as 50 and as few as two grouse have been seen sharing a strutting ground. The average size of an arena is about one acre.

As one watches the show, it appears the males are performing for each

other. Few females are seen in the area. Those that do show up seem disinterested.



The grouse in full strut is in constant motion. The spread tail, contrasting feathers and the puffed up air sacs are important visual parts of the big show.

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Off by himself, a male practices his routine and eyes his reflected glory.

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According to the experts, the male is equally unattracted by the fatherly duties once courtship and mating are complete. He lends no assistance in nest building, egg tending or rearing of young.

A few well-known strutting grounds have attracted a great many onlookers during the strutting display ... to the point where wildlife biologists are concerned about the affect this may be having on the birds and their productivity.

If you've not seen the sage grouse strutting spectacle, we hope these photos will help you to visualize it. If you must witness the event in person there are some things you can do to minimize your impact on the birds. Although the birds will seemingly tolerate your close approach, too many people approaching closely may have a serious impact on mating success.

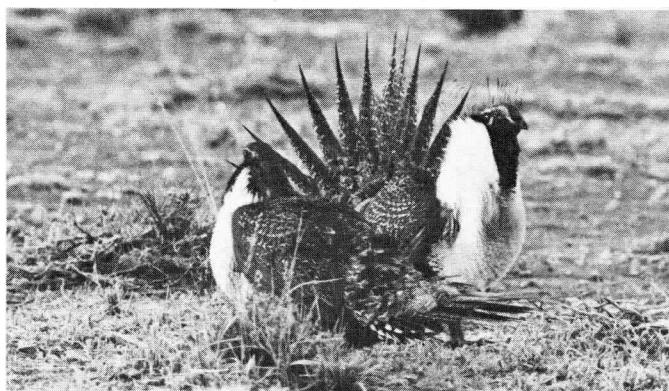
Rather than approaching close up, viewers are advised to stay back at least 200 yards and use binoculars or spotting scope to bring the birds close.

The female will lay from seven to thirteen eggs. For many years in Oregon, this annual production of young has been poor. Numbers of sage grouse have been declining here, and apparently throughout the west.

No firm cause has been pinpointed for this decline. A combination of predator losses and gradual environmental changes are suspected.□



A female sage grouse wanders unconcerned through a pair of competing males. Females seldom venture onto the strutting grounds during display time.

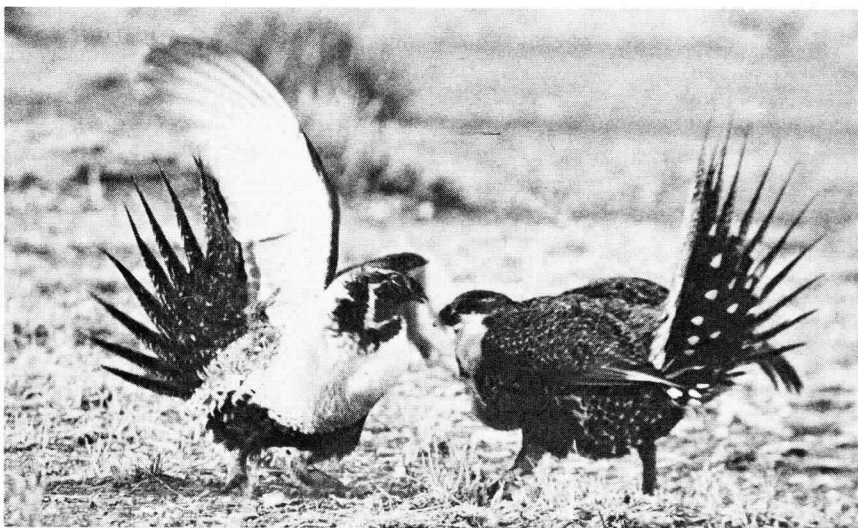


A gentlemen' discussion



The white neck cape of the male sage grouse stands out in the early morning sun.

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Push comes to shove.

*Story & Photos by Jim Gladson*



Since Youth Hunter Education became mandatory in 1962 casualties have taken a steady downward trend.

## OREGON HUNTING ACCIDENTS — 1979

*by Tony Faast  
Hunter Education Coordinator*

Oregon hunting accident statistics continued in a downward trend, with 39 total mishaps recorded for 1979. It was the lowest year ever for fatal accidents, with only three being recorded. Since more than 400,000 licensed hunters account for literally millions of man-days of recreation, these figures are remarkable.

While this trend toward fewer accidents each fall is encouraging, the general breakdown of the statistics remains fairly consistent from year to year.

We can expect half of Oregon's hunting accidents to be self inflicted with another third of them involving a hunting partner. Over two-thirds of these accidents occur at less than three yards and about half of the total will be accounted for by juvenile hunters.

Last year was no exception, with 1979 figures being within a few percentage points of the five year average in these categories.

Accidents with handguns were up slightly (38% in 1979 with average being 26%) but none of these could be attributed to the handgun hunting option for selected big game that was initiated this year.

Handgun accidents occurred while individuals were out small game hunting and "plinking" or carrying pistols as sidearms while engaged in other hunting activities. (One hunter shot himself in the leg with a .357 magnum handgun while out pheasant hunting!)

Bowhunters figured in Oregon statistics this year for the first time when an archery fatality was recorded. This tragic accident occurred when a

member of an elk hunting party came into the line of fire of another bowhunter. The arrow had traveled some 200 yards past an elk running back through a line of hunters. The victim was out of sight of the shooter who was not aware his companion was in his line of fire.

Basic hunting safety rules are applicable no matter what type of hunting arm is used; rifle, handgun, shotgun or bow. Being aware of these safety rules and practicing safe handling with all weapons is the first step in becoming a safe and responsible hunter. Knowing how accidents occur and in what situations they are most likely to happen is the next step in preventing a hunting accident. Take some time to look over these 1979 casualty figures; they may help insure you do not become a statistic in 1980. □



## OREGON'S 1979 HUNTING CASUALTIES

<b>TOTAL CASUALTIES</b> .....	39	
FATAL.....	3	8%
NONFATAL.....	36	92%
Self-inflicted.....	21	54%
Hunting partner.....	12	30%
Other shooter.....	6	16%

<b>AGES OF SHOOTERS</b> (INCLUDING SELF-INFLICTED)		
-19.....	18	46%
20-29.....	9	23%
30-39.....	4	10%
40-49.....	3	8%
50-59.....	2	5%
60-69.....	-	-
Unknown.....	3	8%

<b>DISTANCES</b>		
Less than 3 yards.....	28	72%
3-25 yards.....	1	2%
26-50 yards.....	5	13%
51 yards and farther.....	5	13%
Unknown.....	-	-

<b>HUNTING EQUIPMENT INVOLVED</b>		
Handguns.....	15	38%
.22 caliber.....	10	
Other.....	5	
Rifles.....	13	33%
.22 caliber.....	6	
High power.....	7	
Shotguns.....	10	27%
Muzzle loaders.....	-	-
Bow.....	1	2%

<b>PRE-SEASON</b> (BEFORE SEPTEMBER 1)		
Fatal.....	-	-
Nonfatal.....	10	27%

<b>SEASON</b> (SEPTEMBER 1 TO JANUARY 1980)		
Fatal.....	3	8%
Nonfatal.....	26	65%

<b>COMPARISON STATISTICS</b>		
	Total	
Year	Casualties (Fatal)	
1978.....	50	(5)
1977.....	41	(6)
1976.....	50	(4)
1975.....	58	(7)
1974.....	35	(6)

DURING THE PAST FIVE YEARS HUNTING LICENSE SALES HAVE AVERAGED APPROX. 400,000 PER YEAR.

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## RED FOX

Travelers in the Willamette Valley who pause to watch the early morning sun play over the rolling fields, may sometimes see another animal in the golden light.

For the red fox, early morning is a good time for mouse hunting. Intent on its prey, the fox often puts on a good show of stalking and pouncing.

As familiar as this animal is now in northwestern Oregon, a scant 50 years ago this fox apparently did not inhabit the valley at all. One red fox was trapped in the northwestern corner of the state in 1930, but the next confirmed take was not until 1942. Several reference volumes note that the red fox was "introduced" to the Willamette Valley, but none attempt to tie down a date.

Nevertheless, the red fox, one of three fox species found in Oregon, has been a long time resident of the eastern Cascade slopes and the mountains of northeast Oregon. This fox, known to scientists as *Vulpes Vulpes* is common throughout much of North America and Europe.

At 14 pounds, the red fox is slightly larger than the gray fox of timber country and twice as big as the kit fox of the southeastern Oregon desert.

The red fox likes open fields close to timbered cover and feeds primarily on creatures found in such places. The diet is mainly rodents but may also include birds, frogs, eggs and even insects and berries.

Although the red fox often fits its name, the species does come in several other colors. The fox may be black, silver or "cross", meaning it has a dark cross on its back and shoulders. The key to identifying the red fox, regardless of color, is the white tip on the tail. No other fox has it.

The red fox mates in January, and four to five pups are born around fifty days later. The den is often dug close to hunting territory, sometimes on high ground in the middle of an open field. Occasionally the fox will use the old den of another species such as the badger, or a natural crevice among rocks.

Foxes mate for the season, and in some cases even mate for life. Both male and female take care of the young. After a long summer of being fed by the parents, the young pups are usually ready to strike out on their own by fall. □

Jim Gladson

# THIS AND THAT

*Compiled by Ken Durbin*

## Old Bones Used to Study Lead

Experiments on ancient human bones unearthed in Peru suggest that modern Americans are being contaminated with 500 times more lead than under natural conditions. The research, done by Harvard University and the California Institute of Technology, was done to discover how much lead in the human environment should be considered "normal". Since man has been mining and smelting lead for some 4,500 years, specimens from a remote area isolated from contamination were needed. Lead found in the 1,600 year old bones from Peru's northwest coast came mainly from food consumed. Disagreement remains on whether lead levels to which residents of industrialized countries are exposed are hazardous.

*Conservation News*

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## Reptile Dealer Sentenced

One of the nation's largest dealers in rare reptiles has been sentenced to a year in jail and fined \$10,000 for smuggling endangered species.

Henry A. Molt Jr., 39, Berwyn, Pa., operator of the Philadelphia Reptile Exchange in Willow Grove, Pa., was convicted of importing 10 radiated tortoises, an endangered species native to Madagascar, and trying to sell them to the Bronx, N.Y. and Knoxville, Tenn. zoos for \$10,000.

*New Mexico Wildlife*

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## Nevada Game Agency Changes Revenue Base

Instead of deriving revenue from license and permit sales, the Nevada Fish and Game Department now will be financed from general funds allocated by the state legislature. That state's chief of wildlife management claims the new base of financing will end serious financial losses recently incurred since the agency started limiting the number of big game hunting permits sold.

*Texas Parks & Wildlife*

## Roast Alligator

Alligator meat a gourmet item? Now that it is again legal to hunt alligators in several Louisiana parishes and to sell their hides, members of the Louisiana Sea Grant Marine Advisory Program are promoting use of the alligator meat as well. Until now, the alligator has been valuable only for its skin, though some consider the tail meat a delicacy.

Recently, the Marine Advisory Program invited restaurant owners, seafood dealers, and homemakers' clubs to sample a range of alligator dishes. The meat came from all parts of an 11-pound alligator. The alligator was stewed, barbecued, fried, and sauteed in sauce piquant. Guests said they could not decide on the taste. Some compared it with catfish; others said it was like pork roast, chicken, or frogs' legs.

*Audubon Econotes*

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## Acid Dust

You've heard of acid rain — how about acid dust? That is how sulfur oxides and nitrogen oxides come down in Los Angeles, where rain is irregular. Two scientists at the California Institute of Technology collected dust on flat plates covered with a sticky substance and exposed to Los Angeles air. They found that twenty times more acidity reached the ground as solid particles than as rain. They also discovered that the concentrated acidity of smog particles could burn holes in a leaf's surface. And, unlike rain, acid dust flows into buildings, where it can damage plastic and rubber.

*Audubon Econotes*

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## Salmon Run 'Sinks' Boats

An AAP news agency fish story of the year comes from Seattle, on the west coast of the U.S.A. It reported that in a frenzy of one of the biggest salmon runs in years in Alaskan waters, commercial fishermen netted so many fish that 15 boats sank under the weight in the Bering Sea. One fisherman said he and two partners caught nearly \$147,000 worth of sock-eye salmon during a surprising run in Bristol Bay, Alaska.

*Australian Fisheries*

## The Pope Bow Hunts

Pope John Paul II is an expert bowhunter according to a report in the CCRKBA publication POINT BLANK. A Georgetown University Government Professor, himself of Polish ancestry and editor of a four-volume work on THE WISDOM OF CONSERVATISM, attended college at the University of Krakow when Karol Wojtyla was Archbishop of Krakow.

Peter Witonski met and became friends with Archbishop Wojtyla. The future Pope took Witonski on a hunting trip in the Tatra Mountains where he taught the student to hunt with a bow and to skin and dress his deer, a skill Witonski still practices on his farm in Vermont.

*Tennessee Bowhunts*

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## Oil Drilling Stopped for Elk

The Michigan Supreme Court has stopped plans by three major oil companies to drill 10 exploratory wells in the state's Pigeon River State Forest because of what the court terms "apparent serious and lasting damage" to the only remaining large wild elk herd east of the Mississippi River. The herd of Rocky Mountain elk numbered some 1,000 in 1963 but now is down to 250 animals.

*Texas Parks & Wildlife*

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## Atlantis Revisited?

Underwater photographers from the Soviet Union think they may have discovered the lost, mysterious continent of Atlantis described by Plato more than 2,000 years ago. Russian oceanographers, including a scientist specializing in unexplained maritime phenomena, have been interpreting eight underwater photographs taken from a diving bell near the island of Madeira, southwest of Portugal. They have found ruined, flattened remnants of stonewalls or bridges and stairways at the exact spot indicated by Plato in his writings. The scientists believe that a chain of flat-topped mountains now 100-200 meters below the surface are geological evidence that Atlantis may have been more than a myth — that it actually did sink into the sea due to upheavals along the ocean floor.

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*Oregon's*

# WILDLIFE WINDOW

Making a living on your own has always required certain skills or adaptations. Wildlife have a lifelong struggle to provide for themselves and/or their young for there are few helping hands or welfare systems in the natural world.

To exist, every creature needs at least three basic items — food, water, and some form of shelter. The story does not end there, however. Like you and I, each animal must have the right kind of these necessities. Each is adapted to eating only a limited range of things. Many have some very special water requirements as well as shelter needs.

Some animals are more adaptable than others. These will likely be the ones that survive the longest in areas where habitat is being changed by man or nature. Most of the more adaptable creatures show a good tolerance for human disturbance, eat a wide range of food items, and can live in a variety of places. Animals like the raccoon, coyote or opossum are examples.

It is more than just attitude that makes an animal able to live in diverse settings. The kind of teeth it has, body shape, length of legs, type of feet, and body covering such as scales, feathers or fur are among the physical adaptations that determine where and on what an animal will live. Internal conditions like type of digestive tract, size of heart, lung capacity, or blood supply to certain

muscles also mesh with the easily observed external features in adapting creatures to their environment. Ever wonder why your dog can eat certain things and not get sick and you cannot? Internal adaptations do make a difference.

Is there such a thing as an all-purpose animal? Probably not, although the human animal comes pretty close as a result of our brain enabling us to devise "tools" to make up what our other physical adaptations are lacking. The most adaptable wildlife are generally only mediocre in terms of

the specialties like running, flying, swimming, or rapid reproduction. Creatures that develop highly specialized adaptations are the most vulnerable to change in their habitat. So long as those changes do not occur however, the highly specialized animal can live nicely.

Adaptations are vast and fascinating. There are too many general and specific cases to cover here. For a beginning look at adaptations write to us at the Wildlife Window for a leaflet showing adaptations of some Oregon mammals.□

## THIS MONTH'S WINDOW

### Design an Animal

**After studying adaptations of a variety of wild creatures, choose a habitat you like. Describe the habitat in detail and its conditions, including the food, water, and cover available.**

**Design an animal ideally suited to live in that habitat. Draw a picture of the creature you have designed. Does it resemble any animal you already know about?**

# HUNTING SEASON OPENING DATES SET

The Fish and Wildlife Commission has established opening dates for major hunting seasons in 1980. As usual, the opening dates were set early in the year for the benefit of those who must establish vacation schedules.

All staff recommendations were approved, and they generally correspond with 1979 opening dates. The only major change is a two weeks later opening for the general bowhunting season. All seasons open on a Saturday.

The general buck deer season will open statewide on October 4. The split elk season initiated last year will

be continued on both sides of the Cascades with Rocky Mountain elk opening dates of November 1 for the first period and November 8 for the second season. Roosevelt elk season opening dates will be November 8 and November 15.

The rifle antelope season will open August 16 and the general bowhunting season on August 23.

Blue and ruffed grouse seasons will open August 30 as will the season for mountain quail in western Oregon. The season for chukar and Hungarian partridge will open October 4 in eastern Oregon with the deer season. On October 18 seasons will open for

cock pheasant and valley quail statewide, for chukar partridge in western Oregon and for mountain quail in eastern Oregon.

The Commission considered only *opening* dates at its recent meeting. Season lengths, bag limits, antler point rules, open areas, road closures and other season regulations will be set later in the year when the results of biological field surveys are available. Bear hunting regulations will be set February 22; seasons for antelope, cougar and bighorn sheep on March 20; deer and elk on May 31; and upland birds and waterfowl on August 15.□

## ONE IN TEN CONTRIBUTES

Preliminary reports from the Department of Revenue indicate that about 10 percent of those Oregonians filing early state income tax returns are contributing to the non-game wildlife fund. Some have not been satisfied with a \$5 contribution, however, and have written in a larger amount.

Unfortunately, says Jean Anderson of the Revenue Department, amounts other than the \$1, \$3, or \$5 specified on the tax form cannot be accepted. Returns with other amounts written in have to be sent back to the taxpayer for correction. The law, as adopted by the Legislature, authorizes only those contributions specified on the tax form.

So please do contribute ... but only by checking one of the amounts specified. Do something wild, but not too wild!



## DO SOMETHING WILD!



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