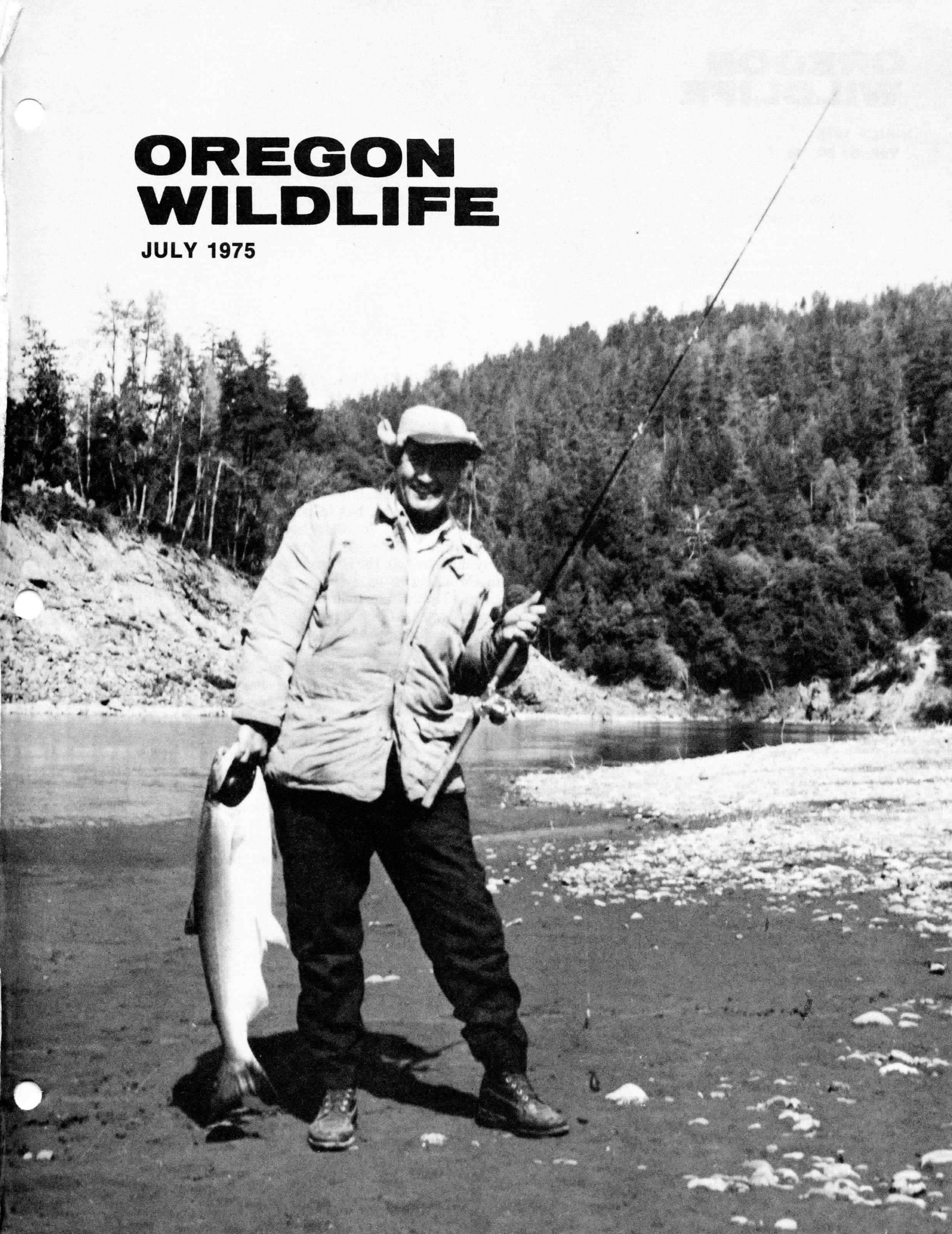
OREGON WILDLIFE

JULY 1975



OREGON WILDLIFE

JULY 1975
Volume 30, No. 7

RON E. SHAY, Editor
HAROLD C. SMITH, Staff Artist

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The Cover

Anadromous salmonids provide some of our most exciting angling. Harry Wagner tells about them in feature article.

Photo by Milt Guymon

HUNTER EDUCATION PROGRAM

INSTRUCTORS APPROVED

Month of May	24
Total Active	1,666

STUDENTS TRAINED

Month of May	611
Total to Date	220,703

HUNTING CASUALTIES REPORTED IN 1975

Fatal	0
Nonfatal	8

The Constancy of Change

It has been said that one of the few things in life that is constant is change. From day to day our lives are continually being assaulted with large and small changes.

In the biological systems that are at work on our earth, change is necessary to keep the systems going. The balance of nature is often discussed as if it were a static thing operating in nature, but in truth it is an ever shifting, constantly changing set of circumstances. It might better be compared to a teeter-totter than an actual balance.

Not too many months ago, the Oregon State Game Commission became the Oregon Wildlife Commission as a result of legislative action. Now, another change has occurred. The 1975 Legislature has merged the Wildlife Commission with the Fish Commission of Oregon. In the 1920's the two groups were a single agency, but were then split into the arrangement we have had.

The new legislation created a seven person commission to be the policy making and regulating group for the fish and wildlife resource of the state. As we go to press the names of the new commissioners have just been announced. They are Mrs. Louisa Bateman of Klamath Falls, Mr. John Boyer of Monroe, Mr. Allan Kelly of Portland, Mr. Walter Lofgren of Portland, Mr. Frank Pozzi of Portland, Mr. McKee Smith of Portland and Mr. Jack Steiwer of Fossil. Mrs. Bateman and Mr. Kelly were members of the Wildlife Commission and Mr. Smith a member of the Fish Commission. John McKean, director of the Wildlife Commission, was named acting director of the new Department of Fish and Wildlife to serve until the new commission appoints a director.

Our August issue will be largely devoted to the organization of the new agency and we'll have more information on the new commissioners. At this time we anticipate no great change in Oregon Wildlife; however, the only thing constant in life is change.

RES

Anadromous Salmonids — What Are They And Why?

by Harry Wagner
Chief, Research Division
Wildlife Commission

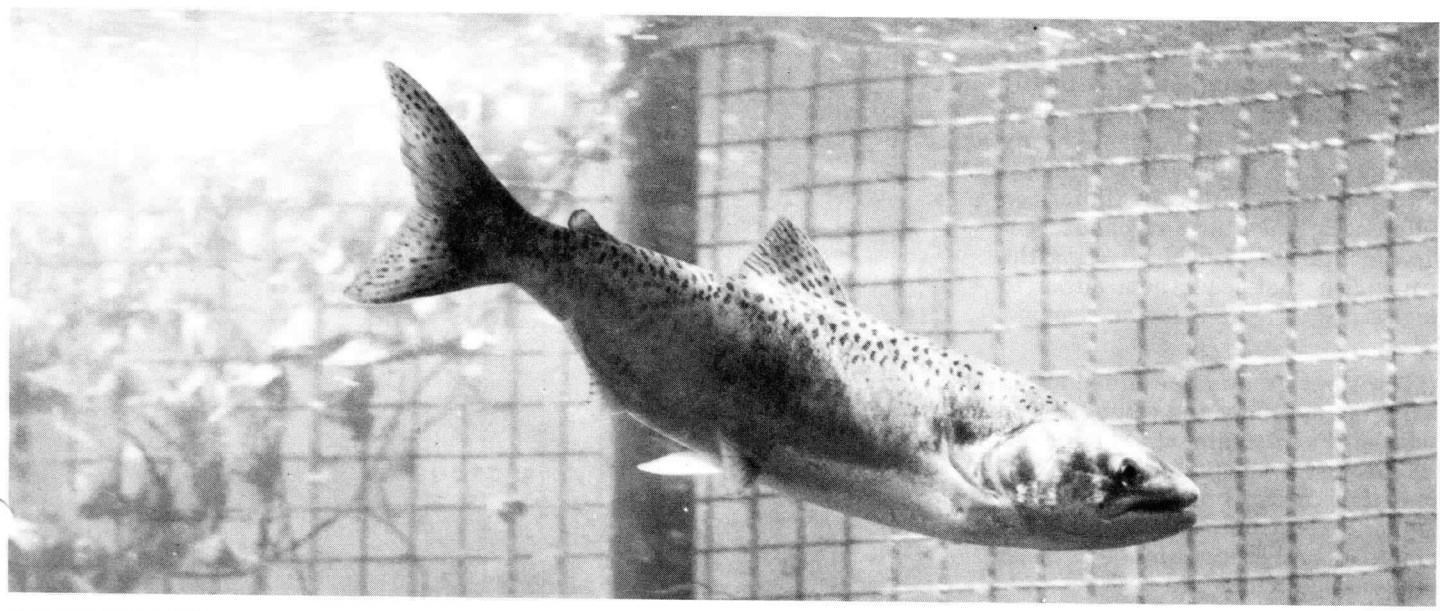
The downstream movement of juvenile salmon and trout has attracted the interest and stimulated the imagination of fishermen and biologists alike for many years. Why do they disappear into the sea, only to reappear as adults a few months or years later? What causes young fish to leave their home streams after a residence of a few days or several years? How do they adapt to the marine environment? Answers to these and other questions are important if the vast and varied migratory fishery resources we enjoy are to be sustained. The answers to these questions become even more important as man modifies the freshwater environments in which these fish reside for part of their life cycle.

Imagine that we inadvertently changed some factor in fresh water that resulted in young fish not migrating to sea or not being able to survive in salt water. Far out? Not so! There is growing evidence showing that the urge to migrate in anadromous salmonids can be influenced directly by water temperature and certain pollutants. Factors involved in seaward migration will be discussed in greater detail later in this article.

What are Anadromous Salmonids?

First, a couple of definitions are in order. Anadromous behavior is found in many diverse groups of fishes. These fish have at least two things in common; they are born and reared, for varying periods of time, in fresh water and then migrate to sea. They remain in the ocean or estuaries until the urge to spawn brings them back to fresh water. The return to fresh water is usually associated with sexual maturation but not always. In contrast, some fishes like the American eel are called catadromous. They spawn in the ocean, the young migrate into fresh water to rear until sexually mature, and then return to the sea to reproduce their kind.

Anadromy is not unique to the family of salmonids, which includes the Pacific salmon, trout, chars, whitefish, grayling, and others, but has evolved independently in a number of diverse forms of fish such as the lamprey, sturgeon, striped



bass, shad, and many others. Anadromous behavior is probably most highly developed in the salmonids but even here the degree varies within and among the different groups. For example, in the cisco group *(Coregonus)* only one species is known to migrate to sea. In the Pacific salmon *(Oncorhynchus)* all six species are anadromous. Pink, chum, and chinook salmon are generally considered to require a period of seawater residency for the successful completion of their life cycle. Movement into the marine environment is not considered essential for completion of the life cycle for coho, sockeye (kokanee), and the Japanese masu salmon.

All species of Pacific salmon have been reared artificially for at least one life cycle in fresh water but naturally occurring populations of pink and chum salmon in fresh water have not been found. Chinook salmon, as well as coho salmon, have been introduced into the Great Lakes and appear to be self-sustaining. Naturally reproducing freshwater populations of kokanee (sockeye salmon) are found in many locations in the western part of the northern hemisphere.

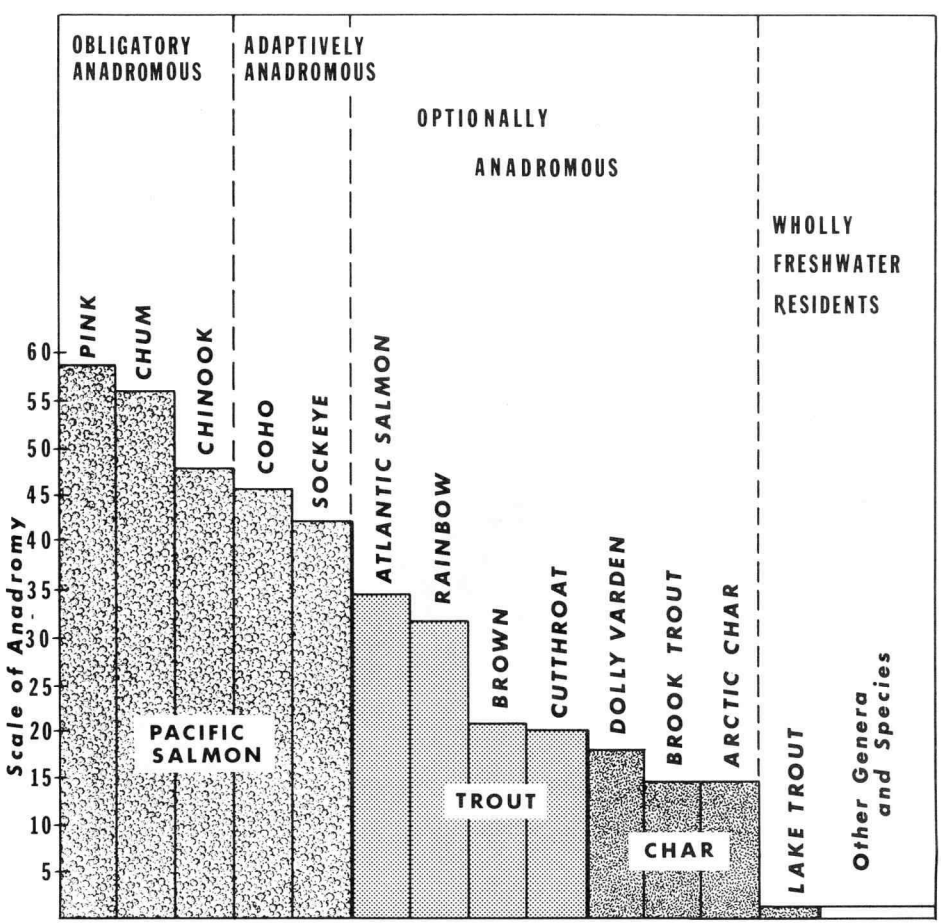
The trout *(Salmo)*, including steelhead or rainbow, sea trout or brown trout, Atlantic salmon, and cutthroat trout, have both resident and anadromous forms, frequently found living side by side in fresh water. No attempt is currently being made to distinguish, by scientific name, migratory from nonmigratory forms. Differences between the two forms appear insufficient to justify such separation. In watersheds where both anadromous and nonmigratory forms exist, it is debatable whether both occur because of inherited differences or because of chance environmental differences affecting the young fish that lead them either to migrate or to remain in the stream.

The trout group is intermediate in terms of anadromy and can be placed between Pacific salmon, which show the greatest development of this trait, and the chars (brook trout, Dolly Varden, lake trout, and others). The whitefish and ciscos show the least anadromous tendency.

Do Anadromous Salmonids have Marine or Freshwater Ancestors?

It is generally believed that the ancestors of trout and salmon originated in fresh water. The migratory forms are not thought to be intermediate links between an ancestoral marine form and forms currently found in fresh water. This conclusion is based on the following facts: Whole groups of fish are strictly found in fresh water; each migratory form, with some exceptions, has a close parallel form in fresh water; there is not a single wholly marine form in the entire family; and conditions suitable for spawning and development of offspring are found only in fresh water. In addition, the ancestoral form of the trout and salmon family is considered to have been more trout-like in appearance. This conclusion is based on the fact that present-day trout have a more primitive bone structure than salmon, thus are considered to be older evolutionary-wise. As mentioned earlier, trout tend to show less anadromous tendencies then salmon. This trait coupled with their earlier origin helps to support the idea of a freshwater beginning for the family.

Anadromous trout *(Salmo)* and chars *(Salvelinus)* differ from salmon *(Oncorhynchus)* in a number of ways structurally. One of the most striking differences, however, is related to a physiological trait. Most adult salmon die after spawning though a few males may survive occasionally. Trout do not usually succumb from the spawning process. The ecological significance of complete mortality after spawning is not well understood. Perhaps, over a long period of time, more progeny survived from adults that channeled a greater amount of their body constituents into producing more and larger eggs but brought on their own doom. At any rate, salmon usually die after spawning but large numbers of anadromous and nonmigratory trout and chars survive to spawn two or more times.



Parr-Smolt Transformation

One of the most striking aspects of the life history of anadromous salmonids is the transformation, or metamorphosis, of a young trout or salmon adapted for life in fresh water into a fish that can survive in the sea. The term that biologists use to describe this change is parr-smolt transformation. The parr is the juvenile form adapted for life in fresh water and the smolt refers to the migratory form that is ready, or nearly so, for life in the marine environment.

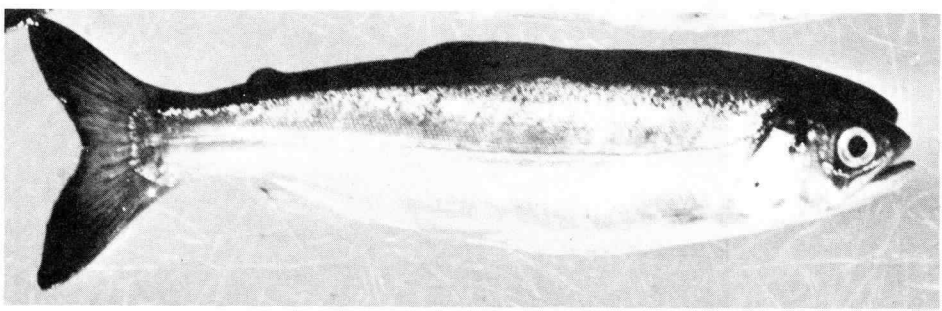
Smoltification is associated with marked changes in the fish's bodily functions as well as its behavior. These changes transform a multicolored, bottom dwelling stream fish into a silvery fish fitted for life in the sea. Salmon and trout that migrate seaward after one or more years in fresh water (generally, all the trout and coho, sockeye, and spring chinook salmon) have a distinct parr-smolt transformation. In those species that spend only a few days or months in fresh water, such as chum, pink, and fall chinook salmon, the transformation is less conspicuous, and perhaps unnecessary since they might not have been fully adapted to life in fresh water. Considerable effort has gone into studies of parr-smolt transformation in certain of the Pacific salmon, steelhead trout, and Atlantic salmon that are raised in hatcheries. A successful hatchery program depends upon producing smolts that upon release migrate quickly to sea and thus compete the least with wild juveniles already in the stream.

Steelhead trout which have reached a critical size of 5-6 inches in length (13-15 cm) will usually become smolts and migrate to sea in the spring. Seaward migration normally peaks from mid-April to mid-May and is usually complete by early June for steelhead trout. Research and experiences in hatchery rearing have demonstrated that the transformation in steelhead and coho is independent of age but relates to size. In nature, most of the steelhead migrate at 2 years of age or older but in the hatchery, with abundant food supplies, fish can reach the critical size and smolt at 12-14 months of age or less. There have been occurrences of coho smolting and migrating to sea in their first spring of life because of accelerated growth.

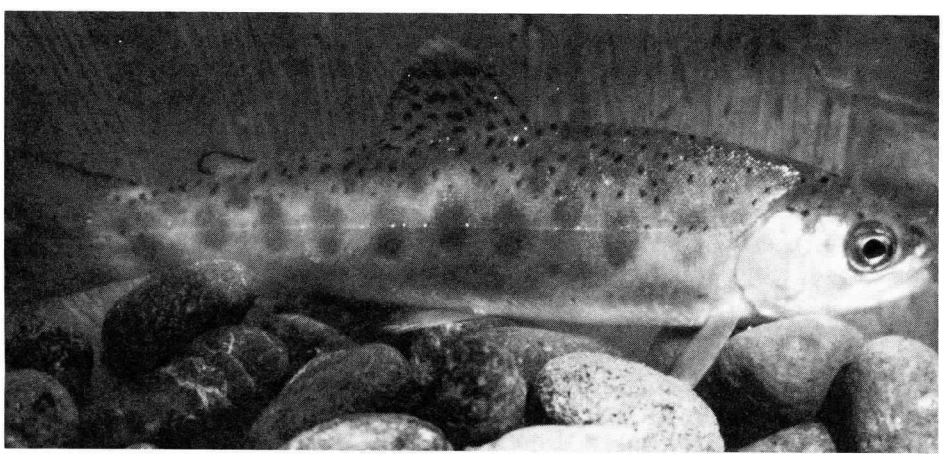
Atlantic salmon are very similar to steelhead trout in their smolt characteristics and life history. Cutthroat trout and Dolly Varden do not make the extensive migrations that steelhead trout and Atlantic salmon do but tend to be more estuarine or in-shore oriented. The brown and brook trout in their native ranges are similar to the cutthroat and Dolly Varden because they do not journey so far into the sea as some of the other species of anadromous salmonids. Little information is available relative to the changes associated with smolting in cutthroat, brown and brook trout, and Dolly Varden. They probably undergo similar changes in preparing for life in the marine or estuarine environment but make less extensive migrations.

Sockeye salmon are usually found in river systems containing large lakes. Fry emerge from the spawning gravels of lake tributaries and migrate downstream where they rear in the lakes for a year or more before smolting and migrating seaward. Smolting in sockeye salmon appears to be similar to that in steelhead trout, coho salmon, and Atlantic salmon. The smolting process in chinook salmon, spring and fall races, is not well understood. Smoltification may occur gradually during a downstream migration that proceeds at a very slow rate in some rivers. A period of adjustment in the estuary may or may not be required.

Recent experiments at the Wildlife Commission's research laboratory in Corvallis have demonstrated the importance of day-length and temperature in controlling the onset and duration of smolting and migration in steelhead trout. Increasing day-length in the spring controls the onset of smolting and migration but high temperatures can abbreviate the migratory period or substantially slow smolting in some fish. It is likely that day-length changes control the time of smolting and seaward migration in most anadromous salmonids. Preliminary data from experiments currently under way indicate that poisoning from heavy metals such as copper can also alter the migratory urge of coho salmon smolts.



The shiny, streamlined fish above has "smolted" and is ready for the ocean. The lower fish has stream camouflage coloring with parr marks.

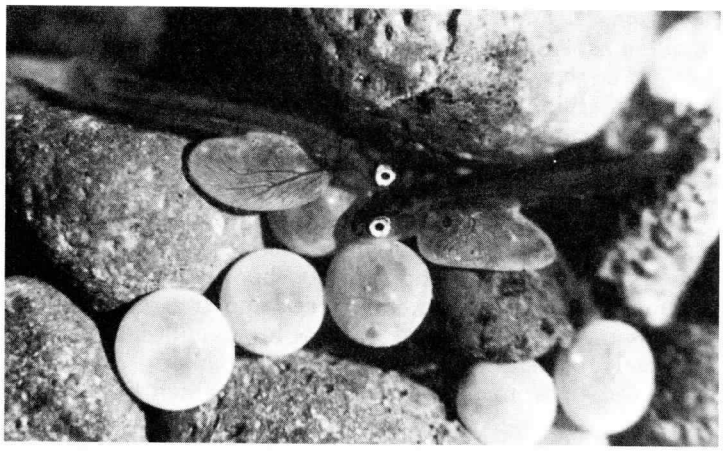


In experiments to determine the role of day-length and temperature in parr-smolt transformation, steelhead trout have been reared in the absence of light and at constant temperature. To the surprise of the investigators, steelhead reaching the critical size have demonstrated smolt-like characteristics and migrational tendencies. These results suggest that the smolting process is basically an internal rhythm and that day-length changes act only to determine that rhythm so that smolting and migration occur at certain times of the year. The timing of downstream movement and entrance into the sea is related to best conditions in the marine environment for the survival of juvenile salmonids.

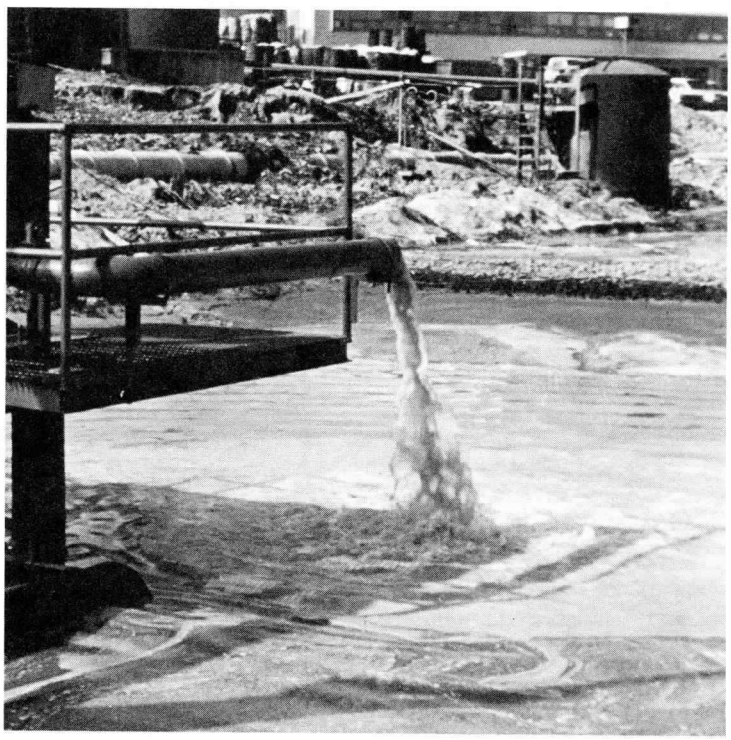
Many of the changes associated with parr-smolt transformation are easily recognized as assisting the fish in its downstream migration and survival in the sea. For example, silvery fish, when viewed from certain positions in the water, are virtually invisible because of the reflection of light. This obviously has survival advantage for small salmon and trout in escaping predators in the ocean. Small fish in fresh water are usually multi-colored as part of their camouflage.

Another example of adaptation that helps the fish in migrating downstream is the change in buoyancy. Young salmon and trout living in freshwater streams spend much time near the bottom and must maintain position as easily as possible. The density of resident forms is greater than in fish preparing for migration. Just prior to seaward movement the fish becomes more buoyant by filling the swim bladder with air. In both situations involving density differences the fish has adapted to minimize energy expenditures for holding position or migrating.

The ecological importance of other changes associated with parr-smolt transformation can not yet be readily interpreted. Parr-smolt transformation in several species that have been studied involves the nearly complete utilization of stored body fat. In contrast, most other animals prepare for migration by depositing fat that can be utilized later for energy during the journey. The low energy reserves could place the juvenile fish in a precarious position if migration is delayed. The using of fat reserves is, in part, responsible for the slender appearance of smolts.



Anadromous fish start life in streams and spend varying amounts of time there. Pollution may kill eggs, young fish, or change their migration patterns.



While the fish is still in fresh water, changes occur that will allow it to survive in salt water. In fresh water the fish must cope with hydration or a flooding of the body with water. In contrast, a major problem for fish entering salt water is dehydration. The fish has to drink salt water to replace the water lost from the body as a result of diffusion, a process where the surrounding salt water draws fluid out of the body. By drinking ocean water, the fish then faces the serious problem of ridding the body of unneeded and deadly amounts of salt. Kidneys and gut can function in excreting only part of the salt load. However, the gills of the fish are believed to contain cells that secrete salt and it is this cellular system that becomes functional prior to entering the marine environment. At some point in the process of preparing for life in the sea the fish begins to show a strong preference for sea water. The preference for sea water might be an important factor causing downstream migration.

Why do Fish Migrate to Sea?

How did this tendency to migrate to sea for part of the life cycle begin? We can probably safely assume from the available evidence that ancestors of trout and salmon lived in streams and lakes in the northern hemisphere. Perhaps random movement, floods, unfavorable conditions resulting in the scarcity of food or extreme temperatures, or some combination of circumstances resulted in the trout-like ancestors acquiring the migratory habit of descending to the sea thousands of years ago. A period of residency in the sea where an abundant food supply probably existed must have had survival advantage, particularly where the productivity of the freshwater environment was low or possibly declining. Parr-smolt transformation probably evolved over a long period of time and has become an integral part of the biology of anadromous salmonids as we know them today.

One of the most intriguing aspects of the life history of anadromous salmonids is their homing instinct. The return of Atlantic salmon to their parent rivers had been recorded by 1653, according to Izaak Walton, by "tieing a riband or some known tape or thread in the tail of smolts and catching them again when they came back to the same place usually six months after". Salmon and trout migrating to sea have developed open-sea navigation to a high degree plus the ability to identify the stream from which they first entered the sea. These characteristics are of importance for fish that undertake migrations of up to several thousand miles in the open sea and reside there for several years before returning to fresh water.

Return to the vicinity of the home stream does not appear to be based on a random search, movement in relation to currents, or any kind of gradient such as temperature, salinity, or other chemicals. From the speed and multiple directions that a given stock of salmon display as they move toward a small coastal area, some directional clues must be providing information for navigation. It appears that the fish knows where it is and where it wants to go. Biologists do not yet know how the fish are able to navigate in the open sea. Perhaps celestial features are utilized in association with a biological clock.

In fresh water, anadromous salmonids become imprinted or conditioned to the odor of the home stream. Once the adult enters the stream on its return, it essentially smells its way back to the general vicinity from which it migrated one or more years earlier. It appears that adult fish retrace in sequence a trail of stimuli that is the reverse of that imprinted in the young fish on their seaward migration. Some straying occurs but the homing and navigational abilities of anadromous salmonids are remarkable.

The distribution of anadromous salmonids through introductions by man is probably limited in fresh water, primarily by temperature and stream discharge. In the marine habitat the distribution is related to temperatures and salinities associated with ocean currents which bring the fish in contact with abundant food supplies. There are proper temperature ranges for different parts of the life cycle which must be met if the species is to prosper. Generally, anadromous salmonids are more capable of surviving and growing in temperatures in the ocean where surface waters usually do not exceed 50° F (10°C). Anadromous salmon and trout have been introduced into the southern hemisphere and appear to be prospering in South America, New Zealand, Australia, and Tasmania where fresh water and marine conditions are suitable.

The anadromous salmon and trout represent a diverse and widespread resource of great value to man. In the last 50 years we have learned a great deal about these fish but our knowledge is still imperfect and inadequate for insuring their continued survival at levels useful to man.

Suggested Reading For Further Information

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□

BIG GAME DAMAGE—A NEVER ENDING PROBLEM

by William C. Hall
District Wildlife Biologist,
Pendleton

Have you ever thought about what damage problems big game animals can create? For many years, big game damage has been a headache to certain Oregon residents but recently, due to increased human population and intensive land uses, damage has soared.

Commission biologists are now servicing more than 2,300 big game damage complaints annually. By species these complaints break down as follows: deer—2,052, elk—225, bear—30, cougar—20, and antelope—2. As may be expected, most complaints center around the built-up areas of Oregon. On some wildlife districts as much as 35 percent of the biologist's time is spent on damage control. Unfortunately, much work expended is for temporary alleviation and the problem persists.

One may ask why we cannot better control damage and the answer is we do have better methods but more problems continue to arise. No doubt the single greatest aid in preventing damage, as well as preserving wildlife habitat, is the control of "urban sprawl". Throughout Oregon we have individual housing as well as large-scale subdivisions being developed on deer, elk, and antelope ranges. Many people desire and plan to live in a more natural setting than the city. Unfortunately, because of poor land use laws and shortsighted development, we move in on big game areas and suddenly the animals that we wanted to live with become a major problem. Throughout Oregon, fisheries and wildlife biologists are working with federal, state, county, and private planners trying to prevent displacement of wildlife by the demands being placed upon the land. We hope our involvement in planning will save good wildlife habitat and prevent damage situations from arising.

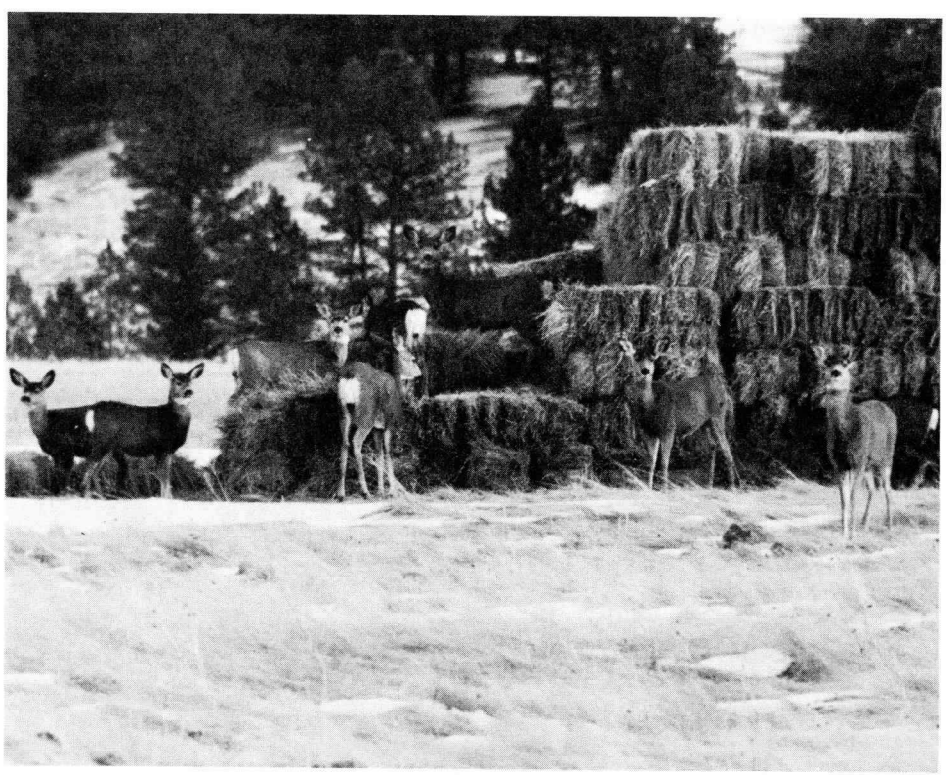
Big game damage falls into five general types: 1) gardens, 2) pastures and grain plantings, 3) fences, 4) trees, and 5) haystacks.

Garden damage may occur on commercially grown crops or on almost anything green and growing around a typical residence. The garden complaint in particular is on the increase throughout the state. In the past, landowners were willing to accept some damage but as food prices have risen and more people have turned to home gardening, tolerance to crop depredations has decreased.

Complaints reporting damage to pastures, grain plantings, and fences usually involve elk. These are some of the most difficult problems to solve. Several of the Commission's wildlife management areas were purchased to control damage as well as provide critical habitat.

Tree damage is a constant problem for the wildlife manager to try to solve. Most complaints of this nature occur in western Oregon on new timber stands and orchards. Control of this type of damage may require special hunting seasons, fencing, or repellents.

Damage to haystacks is a problem in the eastern portion of the state. Most damage is controlled by paneling the stack or fencing.



Mule deer damage to a haystack

Damage Control Techniques

Various control techniques are utilized by wildlife managers to service the 2,300 complaints received annually. These techniques generally fall under the following categories: 1) repellents, 2) physical barriers, 3) transplants, 4) hazing, 5) kill permits, and 6) hunting seasons.

By far the most common damage control technique used is the repellent. Of the more than 1,400 complaints serviced annually with repellent, putrified blood meal and bone oil are most commonly used. The material is normally placed in cloth bags and attached directly to the plant or hung overhead to repel the animals. This type of control is usually temporary and requires periodic maintenance.

Physical barriers include deer and elk-proof fences, tree cages, and haystack panels. Fences and cages are a permanent solution to a damage problem while haystack panels require annual placement. Presently 350 complaints are acted on annually with physical barriers constructed cooperatively with the Commission or by the landowner.

The transplanting of big game animals, in particular elk, to alleviate damage has only recently been economically feasible. Techniques used to capture elk have been refined so that, where the right conditions exist, animals may be trapped and moved to new habitat. This technique has been used primarily in western Oregon although some trapping has been done in the northeast corner of the state. On the west side game managers have wanted to introduce elk into approximately one-third of western Oregon which they feel will support herds. The combination of increased damage in certain areas and lack of elk in others encouraged the transplant program. Although elk transplanting began as early as 1947 in western Oregon, large numbers of elk were not moved until the winter of 1969-70 when the present trapping technique was initiated. Through February 1975 more than 900 elk were transplanted on the west side to 66 sites throughout both the Cascade and Coast Range Mountains.

In northeastern Oregon the transplanting of elk to solve certain damage complaints began the winter of 1973-74. Through February 1975, 262 animals had been moved. In both eastern and western Oregon, elk releases have been made on public lands or private timber lands open to the public, which managers feel will support elk and provide additional recreational experience for the public.

The cost of trapping and transplanting elk in the late forties and fifties averaged around $600 per animal moved. Later efforts in the sixties, when animals were tranquilized, averaged $250 per head. The present trapping technique has cost $100 per animal moved since the program began in late 1969. Trapping and transplanting is not a complete answer since it is never possible to move all of the animals out of an area.

Hazing is another control technique which is used by the wildlife manager. Usually a permit is issued to a landowner which allows him to harass animals causing damage. In other instances cannon guns, firecrackers, crackershells, rockets, or shot shells are used by the manager to disperse big game from damage areas. An average of 250 complaints annually are serviced in this manner. This technique is often used where damage is confined to a limited area during a specific time of the year.

On some complaints, kill permits are issued the landowner when no other control is possible. Animals which are taken must be dressed by the landowner and delivered for charitable uses. Permits often authorize taking of several animals; however, only about 200 animals per year are killed.

For many years the Oregon Wildlife Commission has tried to control certain depredating big game herds with general, special, extended, and/or controlled seasons. Hunting seasons have been a successful tool in controlling some big game damage but often it is difficult to get the hunter and the game together at the same time. Weather plays an important role as well as terrain and vegetation. Landowner tolerance and posted property will prevent a desirable harvest on some damage hunts. Frequently hunters are just not willing to hunt certain habitat types and will concentrate on a more desirable site. The end result is a less than desirable kill and a continuing damage problem.

As long as people continue to invade the places where wildlife lives, we will have conflicts. Landowner tolerances vary greatly and the ability of the Commission to help alleviate damage varies with each situation. Hopefully, careful land use planning and new wildlife control techniques can keep humans and animals compatible in the future. □

Big Game Damage Control Costs 1973-74 Fiscal Year
Oregon Wildlife Commission

Repellents	
Blood meal—8 tons; bone oil—350 gallons	$17,500
Hazing	
shell crackers, shotshells, side salutes, ropes & rockets	1,393
Tree Cages	
579 rods of wire for 1,109 cages	1,466
Fencing	
4,648.5 rods of fencing in 111 fences	12,060
Haystack Panels	
2,067 panels @ $15/panel (8 years use) for 125 haystacks	3,876
Elk Trapping	
202 elk moved (mileage & labor included)	21,935
Mileage	
car—76,227 miles @ 12¢/mile truck—5,444 miles @ 25¢/mile	10,507
Labor	
966 man-days of labor	49,712
Total Damage Cost	*$118,449*

Book Reviews

READINGS IN WILDLIFE CONSERVATION edited by James A. Bailey, William Elder and Ted D. McKinney.

722 pages. Illustrated with photographs, drawings, figures and tables. Published by The Wildlife Society, 3900 Wisconsin Avenue, N.W., Suite S-176, Washington, D.C. 20016; 1975. Price $8.00.

This book is a composite of writings by noted authors selected to present a broad perspective of wildlife conservation. The editors contend that "wildlife conservation is based upon knowledge from many sciences — ecology, chemistry, physics, mathematics, statistics, genetics, zoology, botany, economics and sociology." Wildlife conservation, they say, has need for the specialist and the generalist. The specialist should have knowledge broad enough to comprehend the interrelated roles of the conservation activities. He should be aware, they say, of historical influences upon today's conservation and should be sensitive to human values and the philosophical question of what constitutes wise use. The generalist should be adequately trained in the sciences so that he can communicate with specialists and can use scientific information to establish realistic goals for solving conservation problems, the editors report.

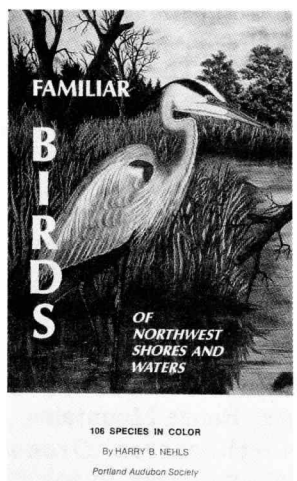
Papers in the book either present important ideas or philosophies or are good examples of activities in wildlife conservation. They should contribute to the education of professionals and laymen who participate in the conservation process.

"FAMILIAR BIRDS OF NORTHWEST SHORES AND WATERS" is the title of a book being published by the Portland Audubon Society. Described and illustrated in full color are 107 species of birds commonly found in rivers, estuaries, lakes, marshlands, ocean beaches, and over the ocean as seen from the shore.

It is designed as a handy pocket-sized field guide, with pointers on how to find the birds. The area covered is southern British Columbia, Washington, Oregon, and northern California west of the Cascade Mountains. It is a companion book to "Familiar Birds of Northwest Forests, Fields, and Gardens," a best seller.

Harry B. Nehls is the author. He is past President of the Society and one of the leading ornithologists of the Northwest. He is being assisted by prominent members including John B. Crowell, Jr., Ruth Harris, James G. Olson and Roy Fisk. Price of the book is $2.50.

For additional information contact: K. C. Batchelder, Chairman, Book Committee, 17283 S.W. Blue Heron Road, Lake Oswego, Oregon 97034. Phone: 636-2154. □



Aid To States Tops $43 Million

Over $43 million of federal aid funds for sport fish and wildlife restoration and hunter safety programs has been apportioned by the Secretary of the Interior to the states and the governments of Puerto Rico, Guam, the Virgin Islands, and American Samoa for use after July 1.

U.S. Fish and Wildlife Service Director Lynn A. Greenwalt said the $43 million is the first of two installments that will be distributed to the states this year from excise taxes collected in fiscal year 1975, which ends June 30. It will be used by the states to finance their fish and wildlife programs during the first half of fiscal year 1976. The second installment will be distributed in December after the tally of FY 75 tax receipts is completed by the Treasury Department. Last fiscal year a total of $70 million in federal aid funds was distributed in two installments to state governments.

Funds for fish restoration programs come from a 10 percent excise tax on fishing rods, reels, creels, and artificial baits, lures, and flies. Funds for wildlife restoration and hunter safety programs come from an 11 percent excise tax on sporting arms and ammunition and a 10 percent excise tax on pistols and revolvers.

"This self-taxing concept has stood the test of 37 years," Greenwalt said. "Since 1938 over $700 million has been collected in excise taxes on these items. Fifty percent of these funds has gone into improving habitat for game such as building dikes to impound duck marshes, constructing watering sites on desert lands for quail and deer, managing forest lands, and fencing elk and deer from farmlands. Twenty-five percent has supported research into such things as census-guided selection of hunting seasons and bag limits and life history studies on a variety of animals such as wolves, grizzly bears, and the Florida panther. Another 20 percent has been spent buying or leasing land such as prairie duck sloughs, winter big game ranges, bottom lands, desert lands — in all, more than 54 million acres or over 84,000 square miles, an area larger than the six New England states, Maryland, and Hawaii combined. Only 5 percent of the funds has gone to administrative overhead."

Of the distribution announced, $30 million was distributed according to a formula based on hunting license holders and the area of each state for wildlife projects. Another $2.6 million was distributed, on the basis of state population, for hunter safety programs. Under the Federal Aid to Fish Restoration Program, $10.8 million was distributed on a formula based on the number of sport fishing license holders and the area of each state.

Oregon's share of the funds are: Wildlife Restoration $774,401, Hunter Safety $39,753 and Fish Restoration $264,921. □

This and that

compiled by Ken Durbin

Regulations Booklets Available

Game mammal regulations booklets for 1975 are now available from license agents throughout Oregon. In addition to season dates, bag limits, open areas, and other pertinent hunting regulations, the booklets give detailed instructions on how to apply for special tags and permits.

All hunters who are interested in applying for a sheep tag or in participating in a deer or elk hunt in August are reminded that the deadline for application is July 15. All applications for these hunts must be received at Wildlife Commission headquarters in Portland by 5 p.m. on that date in order to be entered in the public drawing.

The application deadline for all other deer permits is 5 p.m. on August 5. Elk and cougar hunters have until 5 p.m. on August 19 to apply for special permits or tags.

Since there are no management unit permits available this year for deer, and numerous other season changes were adopted, hunters are urged to consult the new regulations synopsis before filling out any application. Applications incorrectly filled out have to be returned to the sender and if there is not time to return them prior to the deadline, they must be disqualified from the drawing.

*

U.S.—Russian Environmental Cooperation

While not always agreeing on ideology, the United States and Russia have been working together on some programs of interest to conservationists. Our countries have conducted joint polar bear and caribou studies, banded and dyed snow geese migrating between the countries, and exchanged scientists to study each other's wildlife. Last spring 40 musk oxen were transported by air to Russia from Alaska to start a herd to replace the musk oxen that had become extinct in Russia. The musk oxen were also hunted to extinction in Alaska during the last century but during the 1930s some were brought from Greenland to again start the Alaskan herd. It now numbers about 700 animals and threatens to reach the limits of its food supplies on the Nunivak Island where it is located. If the countries will expand these cooperative programs into whaling and fishing, then all mankind will benefit.

Texas Parks and Wildlife

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Alligator Populations Increasing

The "endangered" American alligator, a rare creature throughout its range not long ago, is staging such a remarkable comeback in certain coastal parishes of Louisiana that it is posing a threat to public safety and creating problems for state wildlife officials. 'Gator populations in other parts of the South are also increasing. As a result of this wildlife success story, the U.S. Fish and Wildlife Service will soon formally propose that the alligator be reclassified as "threatened" in large portions of its original range (Alabama, Florida, Georgia, Louisiana, Mississippi, South Carolina, and Texas).

In three Louisiana parishes the 'gator has recovered sufficiently to be totally removed from the protection afforded under the Endangered Species Act of 1973. The State of Louisiana will assume management responsibility for the alligator in those three parishes by initiating a program which will permit a limited, carefully controlled harvest of the species. While the regulated interstate shipment of alligator hides will become legal, import and export of 'gator products will continue to be prohibited.

Conservation News

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Grayling Eggs Received

Some 34,000 Arctic grayling eggs have been received at the Wildlife Commission's Fall River Fish Hatchery near Bend. They came from the Flathead Lake Salmon Station operated by the Montana Fish and Game Department and will be part of a three-year experimental program to establish grayling in the upper reaches of Fall River.

Chris Jensen, who has charge of the Commission's hatchery operations, says the eggs arrived in good shape and some were already beginning to hatch in the shipping crate. Grayling eggs have a short, two-week incubation time, he said.

The eggs will be held in trays immersed in running water inside the hatchery buildings until the young fish are large enough to be transferred to a special pond, now under construction, outside.

Grayling were once introduced successfully to several Oregon high lakes although none still remain. This will be the first attempt to introduce them to streams here.

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Giant Frog

The Goliath frog of West Africa is the world's largest frog. One specimen weighed seven pounds and measured 32 inches from its nose to the end of its extended rear legs. Supposedly an even bigger one got away.

Texas Parks and Wildlife

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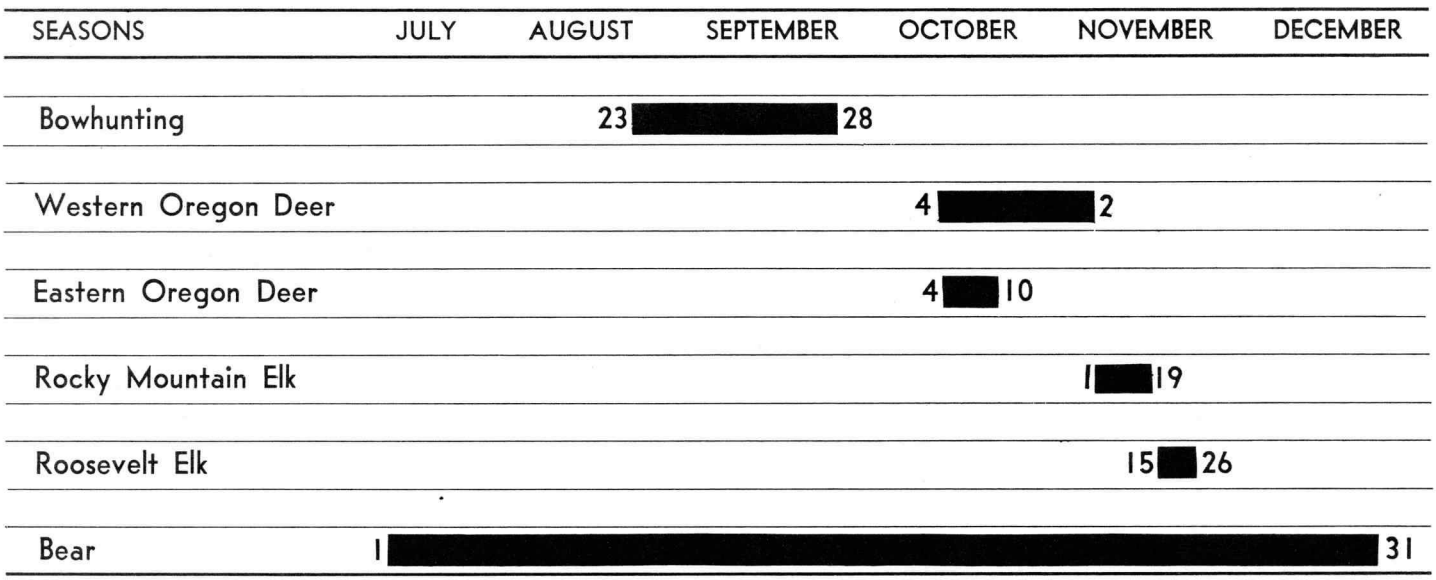
No-No Checklist

Going overseas this summer? If so, take the time to write the Fish and Wildlife Service, Department of the Interior, Washington, D.C. 20240, and find out what is on its list of no-no's in the form of garments and articles manufactured from endangered species. You can buy many of these items in such countries as France and Italy but it is illegal to bring them into this country. Investigators are cracking down both in incoming customs offices and elsewhere. If in doubt, don't buy. Ignorance of the law is not considered an excuse. □

1975 General Big Game Seasons

Consult regulations for details and exceptions and for information on Antelope, Sheep, and Antlerless Deer and Elk Seasons requiring separate tags and permits



Numbers Indicate First and Last Day of Seasons

High Cascade Permit Buck Season: September 13 through September 21. 3000 permits.

Bighorn Sheep Season: September 20 through September 26. 5 tags Hart Mountain
September 13 through September 17. 5 tags Steens Mountain Unit
September 20 through September 24. 5 tags Steens Mountain Unit
September 13 through September 19. 4 tags Owyhee Unit

Cougar Season: December 1 through December 31. 95 tags. Four areas.

(See synopsis for various boundaries)

THERE IS NO OPEN SEASON ON MOUNTAIN GOATS.

CLOSING AND DRAWING DATES FOR 1975 TAGS AND PERMITS

Kind of Tag or Permit	Deadline Date	Drawing Date
Sheep Tags, August Deer and Elk Permits	5:00 p.m. July 15	10:00 a.m. July 25
All Other Deer Permits	5:00 p.m. August 5	10:00 a.m. August 15
Cougar Tags Elk Permits	5:00 p.m. August 19	10:00 a.m. August 29

For forms and information regarding applications consult your local license agency.

OREGON WILDLIFE COMMISSION

1634 S. W. ALDER STREET
P. O. BOX 3503
PORTLAND, OREGON 97208