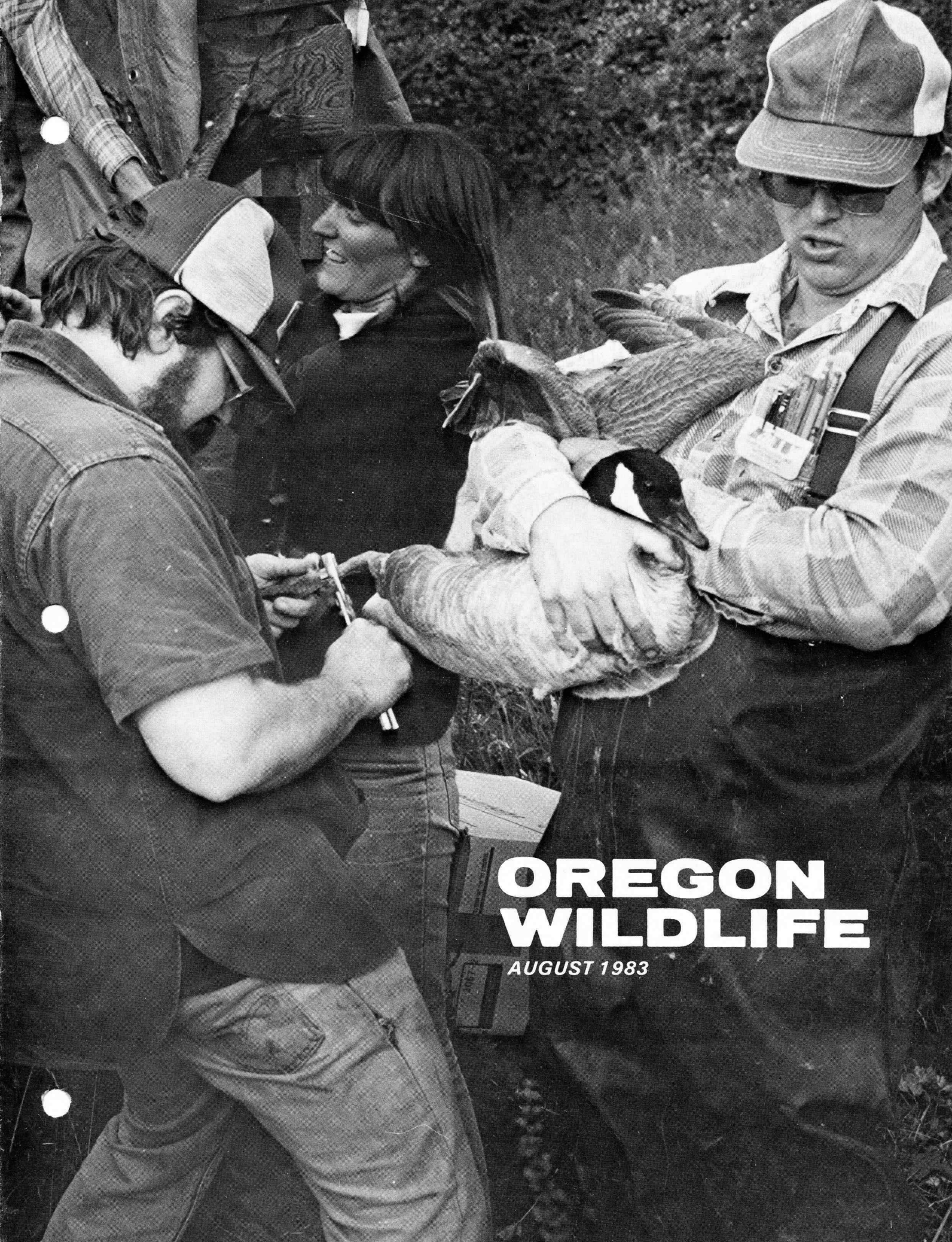

OREGON WILDLIFE

AUGUST 1983

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Volume 38, No.8

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Ron E. Shay, Editor
Ken Durbin, Managing Editor

Cover — Ducks Unlimited members band great basin Canada geese prior to release in the North Fork Siuslaw River. Geese were captured in Washington and are intended to start resident flocks in several Oregon areas. See story beginning on page 10.
Photo by Greg Bolt of The Siuslaw News

HUNTER EDUCATION PROGRAM
INSTRUCTORS APPROVED
Month of June 20
Total Active 1,576
STUDENTS TRAINED
Month of June 542
Total to Date 303,053
HUNTING CASUALTIES
Fatal 0
Nonfatal 2

DRY UP THE MARKET

We have become somewhat accustomed to thinking of the trade in wildlife parts as being something that occurs in foreign lands.

But we don't have to look beyond our borders to find such illicit business. A recent story from the BEND BULLETIN, tells of the arrest and fining of an individual who was offering wildlife parts for sale. The owner of a black powder gun shop was fined $262 for offering wildlife parts for sale when state police officers seized two bear hides, bear claws, two bear claw necklaces, a fox hide and a mounted mule deer head.

Though it isn't our particular cup of tea, we have often looked at photos of individuals dressed in pioneer costumes with considerable bemusement and finally let it go with the idea that everyone should do his own thing. However, as is the case in other types of doing one's own thing, there has to be bounds.

The fish and wildlife resource is the property of the people of the state. Fishing and hunting laws allow the individual to reduce to personal possession a specified portion of this resource during specific times and under very restrictive conditions. It is not a license to promote trade in wildlife parts.

One of the officers involved in the case expressed his concern when he mentioned he felt the attitude of many folks was starting to be one of personal right to possess most any wildlife any time and to do whatever they felt like with it.

Short of habitat destruction, little can be more devastating to fish and wildlife populations than an illegal market for them. There have been classic examples of this in other times and places. Now it is here. Not only is there money to be made on illegally sold parts of wildlife for decorative purposes, but there have been venison selling operations broken up in other parts of Oregon and in other states. California officials have expressed concern over their black bear populations because of the demand for various parts of the animals.

It seems there is always someone around who is willing to make a buck regardless of the consequences. The best way to stop such trade is to dry up the market. If there was no money to be made, this type of poaching would have no reason to exist. In such cases, the person who buys illegal venison, fish or decorative pieces of wildlife is just as guilty as the poacher.

Controlled, legal sport taking of fish and wildlife is not threatening any of the species of the state, but illegal trade could. In most parts of the world the same is true, though controls in some of the less stable nations may be a bit dubious. However, again it is not normally the legal trade that is the problem. This is a case where everyone can help. If you have a yen for a wildlife decoration, some salmon, or someone offers some venison, be sure it is legal. If in doubt, ask. If you're sure it is illegal, let the state police know. It's your resource . . . the individual who steals it steals from you.□

R.E.S.

Commission and Compact Meetings

The Columbia River Compact will meet Friday, August 12, at 9 a.m., to consider early fall commercial salmon seasons for the area downstream from Bonneville Dam and treaty Indian seasons for the zone upstream from Bonneville Dam. Following Compact action, the Fish and Wildlife Commission will convene separately to consider commercial salmon seasons for Youngs Bay.

On Friday, August 26, the Fish and Wildlife Commission will meet at 8 a.m., to conduct a general business meeting, including the setting of 1983 waterfowl and upland bird seasons.

Both meetings will take place at Fish and Wildlife Department headquarters, 506 SW Mill Street in Portland□

Those Unique Salmon

By
Malcolm Zirges
Marine Region

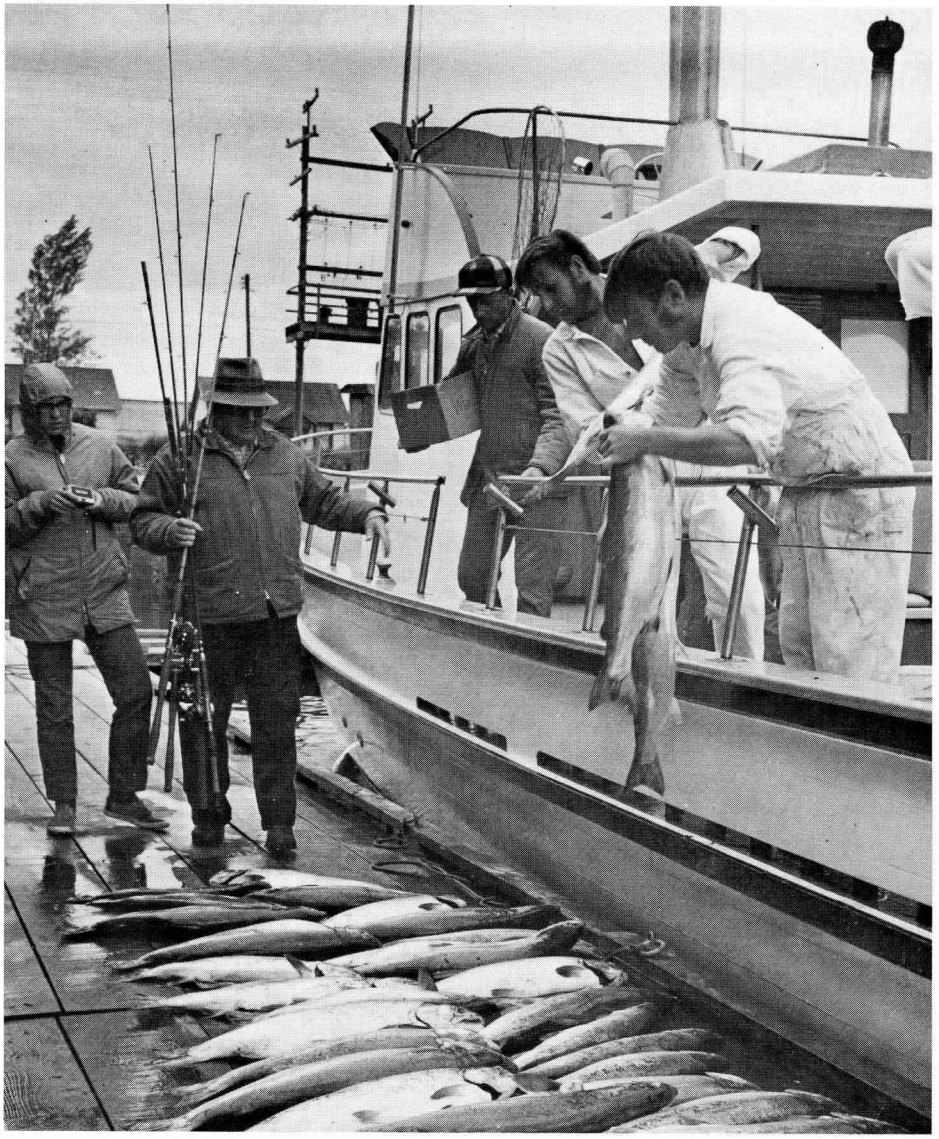
The Pacific Ocean is home to six species of salmon, each different in appearance, migration routes, life history and growth pattern. Most Oregonians only know about five of these, since one is found only in the western Pacific. Let's look at these six species and learn how they differ and why they may have evolved into separate species, how this affects their abilities to adapt and survive in the face of changing environments.

Chinook and coho salmon are found all around the Pacific rim from California to Japan. Chum and sockeye are found mainly from Washington state north and westward to Asia, pink salmon mainly from British Columbia north and west to Asia, and the cherry salmon only around the Sea of Japan.

There is a fish in the Atlantic Ocean called the Atlantic salmon, but it is actually a trout, very similar to our steelhead. Salmon and trout are closely related, however, salmon are thought to have evolved from a trout ancestor.

Steelhead and the Atlantic salmon share an important adaptation of salmon which most other trout generally do not — they are anadromous. Anadromous means the adaptation for spawning in fresh water, but primarily rearing and maturing in the ocean.

Only two salmon species, chinook and coho, are numerous in Oregon waters, supporting extensive sport and commercial fishing. Chum and sockeye salmon also enter Oregon streams. Chums are still produced in some north coast streams and are caught occasionally by ocean fishermen. Sockeye still run into the Columbia River, and contribute a few fish to gillnet catches. Oregon does not have resident populations of the pink salmon. Pinks are often caught off the coast of Oregon, particularly by commercial trollers, but they are all from streams to the north of Oregon, primarily the Fraser River of British Columbia.



Salmon constitute one of Oregon's most important natural resources. Six species of salmon exist in the Pacific Ocean; five of them are found in Oregon waters.

Why The Differences?

Subtle, but nevertheless unique, characteristics of different streams, and even different areas within specific streams, probably led to evolution of the different species. For example, it is not hard to imagine that a large, fast flow-

Some salmon are genetically geared to run only a short way to their spawning grounds. Others must travel more than 1,000 miles on the energy supplied by stored fats and oils. All Pacific salmon die after spawning.

ing river would favor larger, stronger fish, or that a small, shallow stream would be more suitable for a small fish. So the environment may have molded the different species. It is also obvious if you compare species, that they have unique shapes, coloration, behaviour patterns, and other characteristics, so the fish can tell a member of its own kind.

These physical differences can be fascinating in themselves. Consider the beautiful variegated coloration of a spawning chum salmon, the outrageous red body and green head of a spawning sockeye, the magnificent body size and spotting of a big chinook, or the fierce teeth on the kype, or hooked jaw, that forms on most male salmon near spawning time. But we should get on and explore the ways the different salmon species use different parts of the environment.

We must use many generalizations since salmon, like people, do not all act the same. Salmon are adaptable. There are many cases where one species of salmon has seemingly moved into another's niche because of nontypical water temperatures or some other factor. That adaptability is important for survival. Now let's look at some general characteristics.

Run Timing

Timing is an important element in the use of parts of the environment by the various salmon species. Timing of the spawning run is particularly significant.

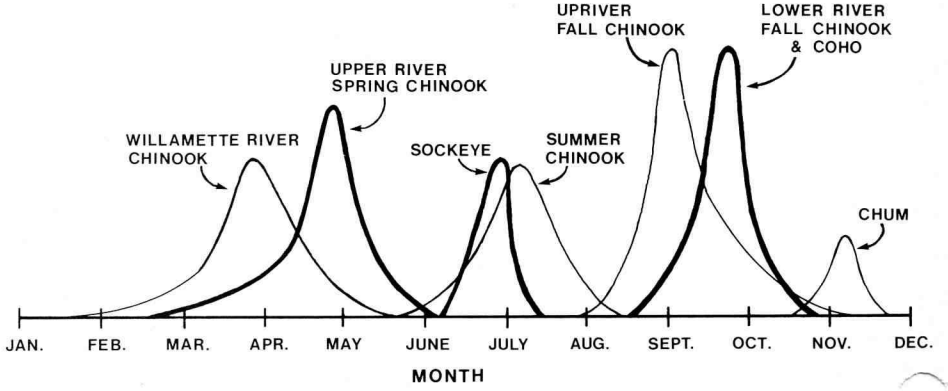
The accompanying chart shows the different times that the several salmon species and races of chinook enter and pass through the lower Columbia River on their way to spawning areas. Each stock of fish has developed a run timing which places the fish on desirable spawning areas at a time when water flow and temperature will be optimum for spawning and, in turn, egg incubation and fry emergence and rearing.

This timing also reflects the distance the particular stock must swim to reach its spawning grounds. Salmon originally spawned from near tidewater up to 1,200 miles in Canada. Since salmon cease feeding when they begin their spawning migration, it is obvious that fish going longer distances need more energy reserves to make the trip. This is done by accumulating more fatty tissue, and the upriver stocks, such as the spring and summer races of chinook, are famous for their high oil content. Short running fish need less reserves and are typically low in oil content. This is particularly true of chum salmon.

Spawning Area Location

Pink salmon typically move the shortest distance into fresh water, often spawning in tidal areas usually within several miles of the ocean. Chum salmon also generally make relatively short spawning runs of only a few miles, although it is not uncommon for them to go 100 miles or more in large river systems. These species prefer relatively untouched small streams that flow directly into estuaries or the ocean.

Chinook salmon generally use the greatest range of river areas for spawning. Chinook may

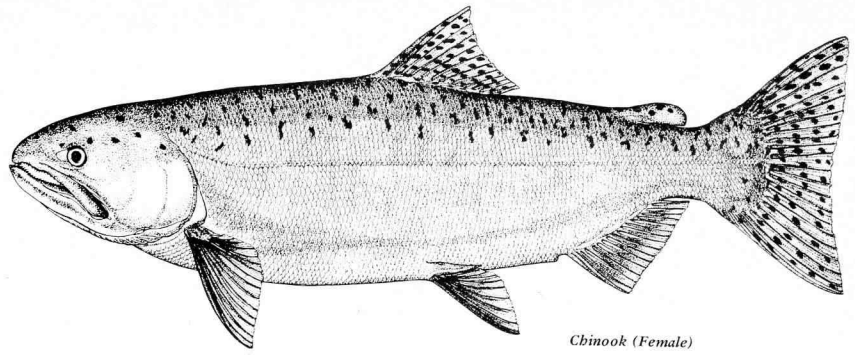


Time of run passage through the lower Columbia River for different salmon species and races.

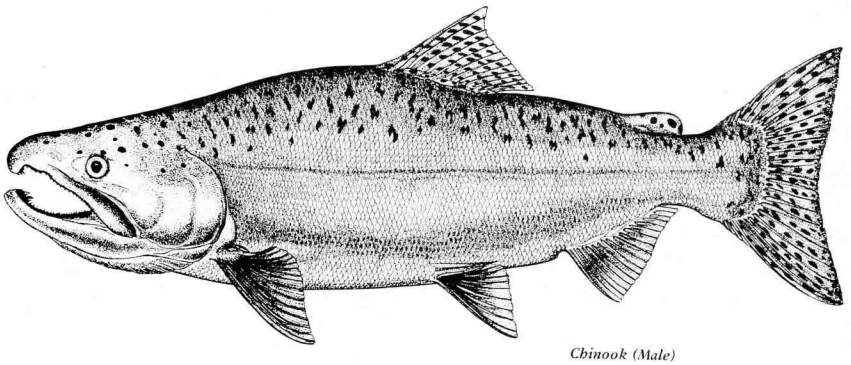
spawn from low in the mainstem of large rivers to smaller tributary streams high in a river system. This flexibility has been particularly important to chinook in large river systems that have been dammed for hydroelectric or other uses.

Coho and cherry salmon spawn in the very upper reaches of river systems, often in streams that dry up in the summer months. These streams are in areas most heavily damaged by road building, logging and other developments. These activities sometimes obliterate spawning areas for these species, and also affect water quality needed by the hatching fry.

Finally, sockeye salmon have adapted to spawn in streams that are usually above lakes or lake systems. In some areas, the Columbia River system in particular, these lake systems are no longer accessible to fish.



Chinook (Female)



Chinook (Male)

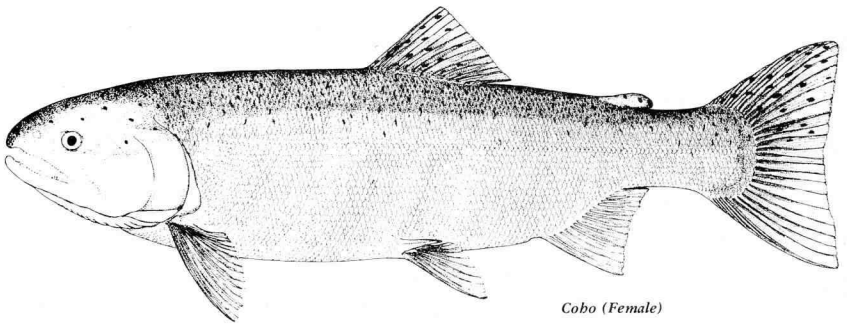
Illustrations by Ron Pittard
Reprinted by permission from *How to Catch and Identify the Gamefish of Oregon,* by E.A. Lusch, Frank Amato Publications, 1978.

Early Rearing

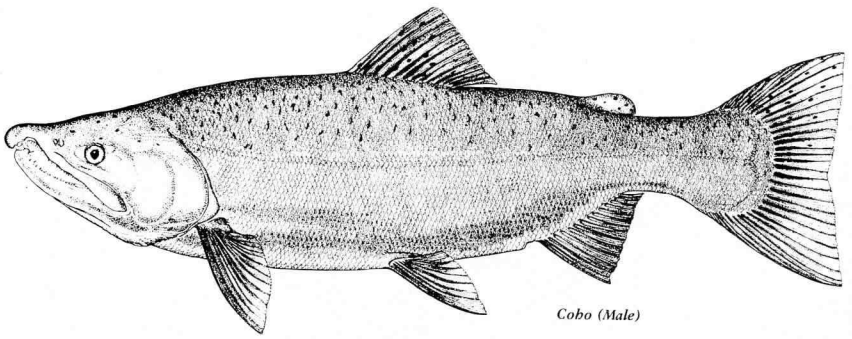
Spawning areas can, and often do, overlap between species of salmon because the needs of the eggs are related primarily to proper flow of water which provides oxygen. Temperature is probably one selection difference between species. For example, sockeye typically seek out and spawn at temperatures ten degrees cooler than chum salmon using the same river system.

Rearing space is very important for the young after they hatch. Suitable rearing areas with the necessary elements, such as food supply, space, cover and other considerations, are limited in most fresh-water environments. Man has had a serious impact on rearing space affecting particularly those species that rear the longest in fresh water.

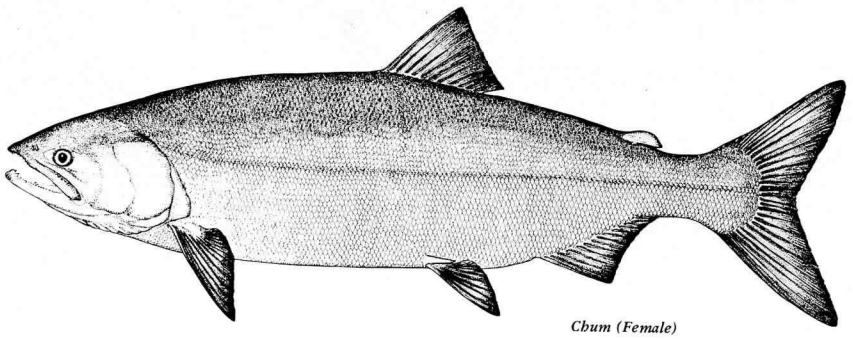
Chum and pink salmon probably have adopted the most extreme "adaptation" to rearing in the fresh-water environment. They typically do not rear there at all, but leave for the ocean almost upon hatching. Some chum salmon, usually those spawned in larger rivers, do rear in fresh water for short periods, but seldom longer



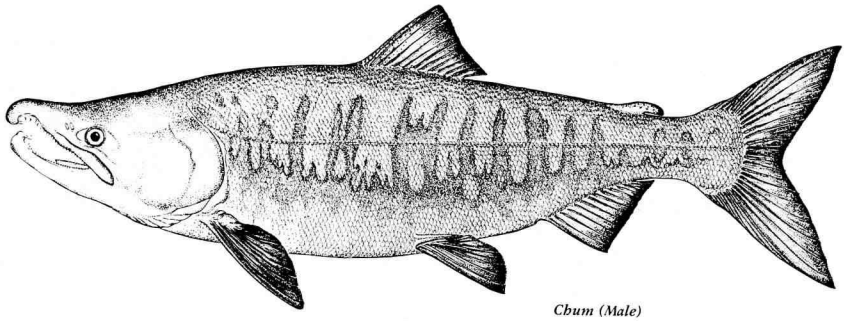
Cobo (Female)



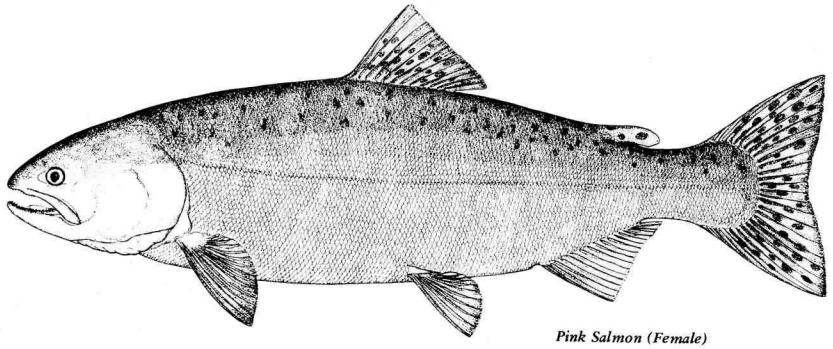
Cobo (Male)



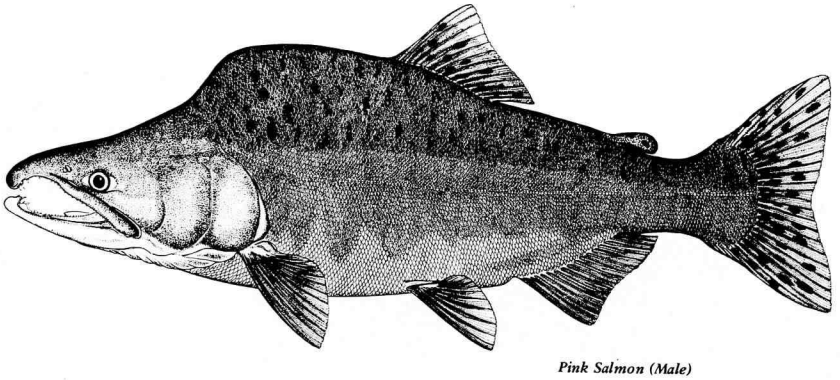
Chum (Female)



Chum (Male)



Pink Salmon (Female)



Pink Salmon (Male)

than two weeks. Oregon chum salmon typically move to sea almost immediately without feeding in fresh water.

Chinook salmon live mostly in large river systems and generally use the greatest portion of those rivers for early rearing. Chinook fry rear from the upriver areas where they hatch out on down into the estuary, typically dropping downstream as they grow and develop. They commonly reside in the river less than three months, except for spring-run fish which stay over a winter in fresh water. Chinook often hold and rear in river estuaries before moving to the ocean. This is very typical in Oregon coastal chinook stocks.

Coho and cherry salmon also drop downstream as they develop, but generally stay in the upper portions of rivers. These species rear over a winter in fresh water, even two or three winters in colder streams in Canada and Alaska. Since streams do not produce a lot of food, particularly in winter, competition is intense in these species. They have developed elaborate territorial behaviour spread the young fish out — stronger fry get a share of available food and cover while excess fish are forced downstream. Coho fry are even known to run off other species as well where distributions overlap.

Young sockeye salmon remain in fresh water the longest of all salmon species. After hatching and leaving the gravel, sockeye fry move into a nearby lake where they rear for one to three years. They feed on plankton and congregate in schools without the territorial behaviour of coho.

Ocean Distribution

The ocean provides a vast feeding area for salmon, and young salmon spread over much of the north Pacific to grow and mature. The Gulf of Alaska, in particular, is a rich pasture for salmon and all North American species are found there. The different species are not just all mixed up over this are rather each searches out certain preferred water temperatures and depths. The ocean that seems so

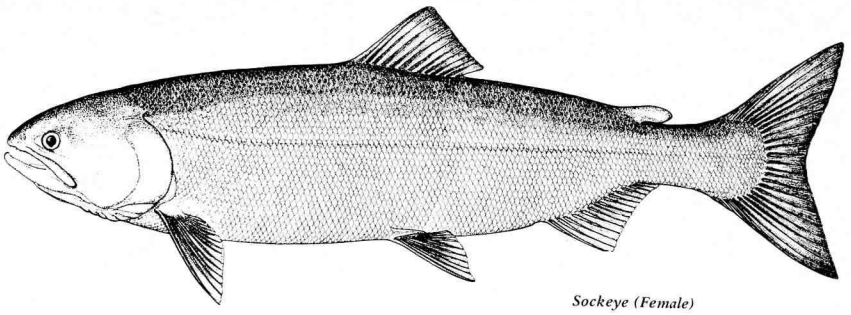
uniform to many people is made up of unique water masses of different temperature, salinity and certain food organism content.

Pink and chum salmon fry, for example, are very small when they first enter the ocean, so they remain near shore for several weeks, their first summer feeding on plankton and small crustaceans before moving offshore. Later, they are thought to use mostly mid- and upper-water levels, still feeding primarily on small prey items such as shrimp. Chum salmon begin feeding on some fishes as they mature.

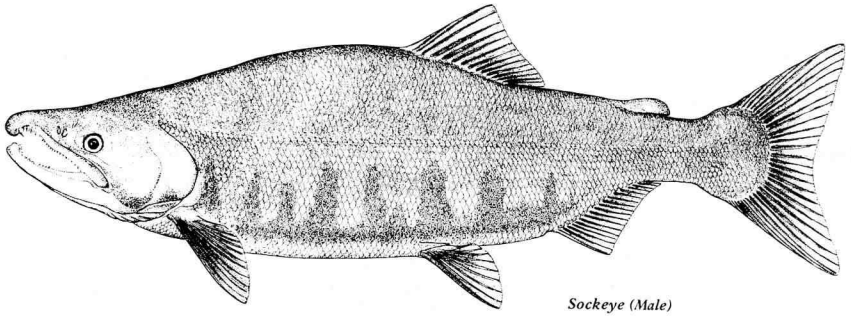
Chinook salmon smolts begin their migration as soon as they enter the ocean, and most chinook, particularly fall-run fish, move northward from their home stream. Their trip can be impressive indeed. For example, one Columbia River chinook was captured and tagged off Adak Island at the tip of the Aleutian Chain, Alaska, and returned to spawn the next year. Chinook like deep water, both in streams and in the ocean, and this species is generally associated with the bottom, or at least deeper water layers in the ocean. Chinook grow rapidly into fish-eaters.

Coho salmon are surface-oriented fish. They move offshore fairly rapidly after leaving fresh water, and are apparently adapted to do this since they are already in their second year of life and are larger than chinook smolts and much larger than chum or pink fry. Oregon stocks have been found both north and south of their home streams. They generally do not move as far as chinook, although their complete migration path is not yet fully known. This species feeds on intermediate-sized prey, including shrimps, squid, crab larvae and small fishes. As much as any salmon, coho feed on what is available.

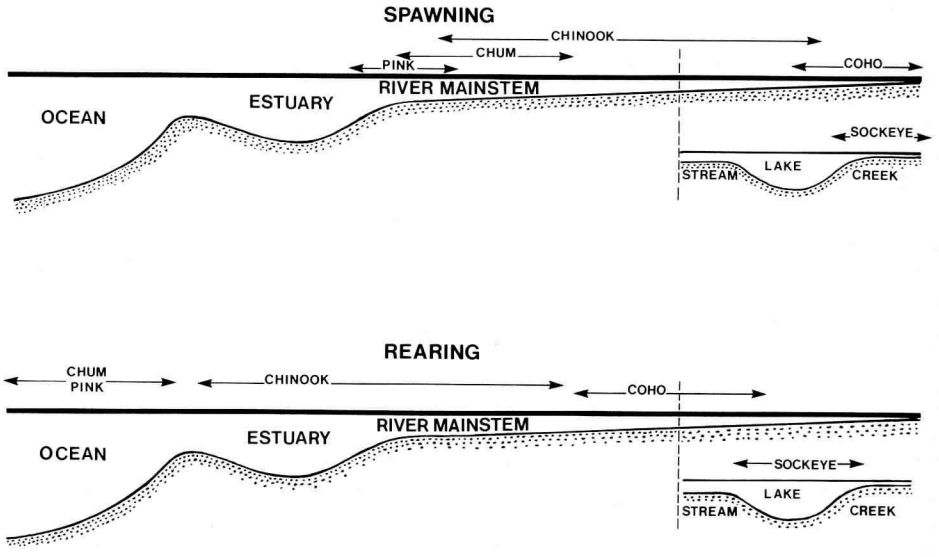
The sockeye is a plankton feeder throughout its life cycle, moving out into the north Pacific in large feeding schools that range to and fro through the swarms of krill and other small ocean animals. This species also seems to orient toward upper water layers, al-



Sockeye (Female)



Sockeye (Male)



General freshwater areas used by different salmon species for spawning and early rearing.

though is not as surface-oriented as the coho. The Japanese fish sockeye extensively with surface gillnets on the other side of the Pacific.

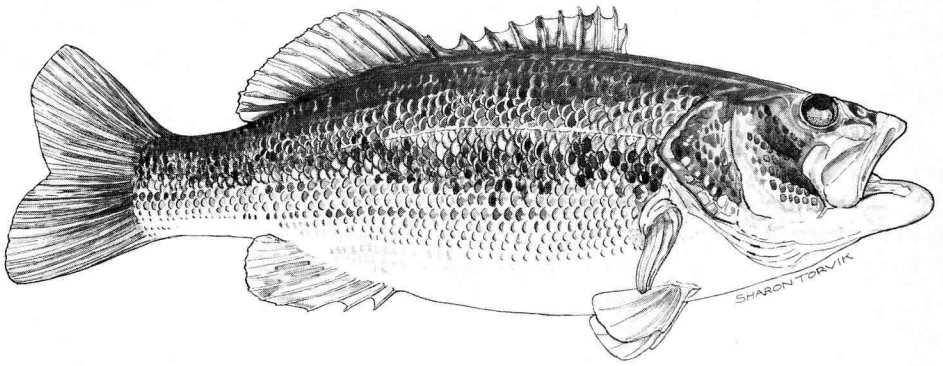
Maturation

Age of maturation is even variable within some species. Chinook mature as late as age four or five and rarely at six. Chinook jacks, or precocial males, however, mature at age two. This characteristic is shared to a lesser degree by sockeye, chum, coho, and cherry salmon. Coho, for example, typically spend two years in the ocean, although some coho males also mature early as jacks. Pink salmon are the exception, invariably maturing as two-year-olds.

Aside from the obvious importance of greater or lesser exposure to ocean fishing fleets and other predators, age of maturity has great adaptive significance when environmental changes occur. In pink salmon, for example, if the eggs from one year's spawners are somehow destroyed in a specific stream, there will be no adults to return to that stream two years later, or two years after that, etc. etc. Only by eventual straying of spawners from some other stream will that stream be restocked. If the destroyed stock was unique in some way, its special characteristics will have been lost.

A variable rate of maturation acts to cushion such disasters. If one year's eggs are somehow destroyed, the fish hatched from eggs deposited one, two, three or four years previous will mature the next year and return to the stream to spawn. This overlap is thought to have important genetic consequences, and species with less age of maturation variation, such as coho, probably are less resilient to change.

If this has seemed like a giant jigsaw puzzle, it is. Salmon are fascinating in their complexity, and have been a fertile field of study for fisheries biologists and other naturalists for many years and will continue to be for years to come.□



Largemouth bass

Oregon is a state made up largely of people whose ancestors originally came from someplace else. When these emigrants moved west during the last century, they brought memories of their homes in the East and Midwest with them. For some, those recollections included the sport of bass fishing.

Those new arrivals found waters filled with salmon and trout, but not with warmwater game fish popular east of the Rocky Mountains. By the late 1800's, this lack had been remedied by both official and unofficial introductions of bass and other panfish.

By the turn of the century, the largemouth bass was well established in the slow moving waters of the Willamette River system, and the string of lakes on the south-central coast.

The largemouth, known scientifically as *Micropterus salmoides,* is a member of the black bass family. A close relative, the smallmouth bass, has also been introduced in Oregon. Smallmouths prefer streams and running water, and are found in the John Day and Snake rivers.

The largemouth is usually dark green on the back and lighter on the sides. There is usually a dark band or streak along the sides as well. The eye is usually gold, lacking the red found in the smallmouth eye.

The easiest way to tell the difference between the two bass species is by the extension of the upper jaw line. The smallmouth jaw extends to about the center of its eye. The largemouth jaw extends back past the eye. This feature is the obvious origin of their common names.

The largemouth bass is a predator. When first hatched small bass feed largely upon tiny water animals, gradually adding insects and, still later, small fish to their diet as they grow. Adult fish feed primarily on fish, crayfish, insects and frogs. But a large bass will take nearly anything that moves that is large enough to get in its mouth, including ducklings and mice on occasion. Large bass often establish a "home lair" next to a stump, rock or other cover and lie in ambush for their prey.

Bass spawn in May and June. The male scoops a shallow depression to serve as a nest, then rounds up a female to deposit eggs. Largemouth may also lay eggs on rootlets, logs or other submerged vegetation.

The eggs, which usually number in the thousands, hatch in three to five days. Largemouth bass mature after three growing seasons. The average weight is around two to six pounds with an average length of ten inches.□

Jim Gladson

This and That

Compiled by Ken Durbin

Bald Eagle Comeback

Is the American bald eagle making a comeback? Yes, says the latest National Wildlife survey.

A decade after DDT was banned in the United States, the bald eagle, once devastated by the pesticide, seems to be making a comeback or recovery from its endangered status, says Brian Millsap, coordinator of the federation's fifth annual nationwide midwinter bald eagle survey. The latest survey, completed last January, was conducted in the lower forty-eight states with the help of hundreds of volunteers.

Since the surveys began in 1979, notes Millsap, the number of eagle sightings each year has increased. Last year, nearly fourteen thousand eagles were sighted, compared with about ten thousand four years earlier.

"Any comeback will be a slow one," said Millsap. "The number of breeding pairs of bald eagles is quite small, only about 1,200 pairs in the lower forty-eight."

South Carolina Wildlife

*

Worth the Price

Most Americans want clean water — and they're willing to pay for it! A recent public opinion poll conducted by Louis Harris and Associates, sponsored by the Natural Resources Council of America, found that a large majority of Americans want clean, safe water.

Curbing water pollution was named by 74 percent of the adult population as "very important" in improving the quality of life. Americans also do not feel they must sacrifice environmental quality for economic growth. By 89 to six percent, citizens are convinced that such a tradeoff is not necessary.

Public support for the Clean Water Act, which Congress will consider extending this year, is also strong. Ninety-four percent of the public wants the Act to be kept as tough as it is currently.

Wildlife in North Carolina

Reduce the Sting

When a bee stings, don't try to pull the stinger out with your fingers or with tweezers. Instead, scrape the stinger out with a clean knife blade or fingernail.

A bee leaves the stinger in its victim when it stings, and then flies off to die. Along with the stinger, though, the bee leaves an attached sac of venom that continues to pulse and inject venom long after the bee is gone. If you grasp the stinger to pull it out, you'll squeeze the sac and inject more venom. Therefore, it's better to scrape the stinger out in order to minimize the amount of venom received and thus reduce the severity of the reaction.

Illinois Outdoor Highlights

*

Firearms Safety Information

Two brochures dealing with firearms safety, published by the National Shooting Sports Foundation, are available free from the Oregon Fish and Wildlife Department. "Firearms Safety in the Home" and "When Your Youngster Wants a Gun" provide helpful tips to the homeowner who keeps guns and ammunition, or the parent whose youngster has reached the age when he or she wants to try the shooting sports.

For a single copy of either or both brochures, write the Oregon Department of Fish and Wildlife, I&E Section, P.O. Box 3503, Portland, Oregon 97208.

*

Hunting Standards

". . . there is value in any experience that exercises those ethical restraints collectively called sportsmanship." — Aldo Leopold, *A Sand County Almanac.*

For the hunter, sportsmanship is as vital to success as an intimate knowledge of his quarry.

Defined by tradition, the principles of fair chase are the self-imposed limitations that set the manner and methods by which he takes game.

The hunter who abides by these standards, whose hunting emphasizes traditional skills and respect for game and landowners, and ethical conduct, will always enjoy a valuable experience afield.

The hunter who disregards these standards, and is willing to bend the rules to ensure a "successful" hunt, succeeds only in deceiving himself and degrading his sport.

Hunting is not a game with winners and losers in the conventional sense. There are only those who are sportsmen . . . and those who are not.

South Dakota Conservation Digest

*

High Bid for Bighorn

A bid of $32,000 bought a highly prized desert bighorn permit in this year's sealed bid auction, according to the Utah Department of Natural Resources and Energy. The bid, $9,500 over last year's, was submitted by the Foundation for North American Wild Sheep from an auction held at their annual convention in Reno, Nevada. Several other bids were submitted by sportsmen from across the country. Money from the special bid permit goes directly into the Division of Wildlife Resources desert bighorn sheep management program.

*

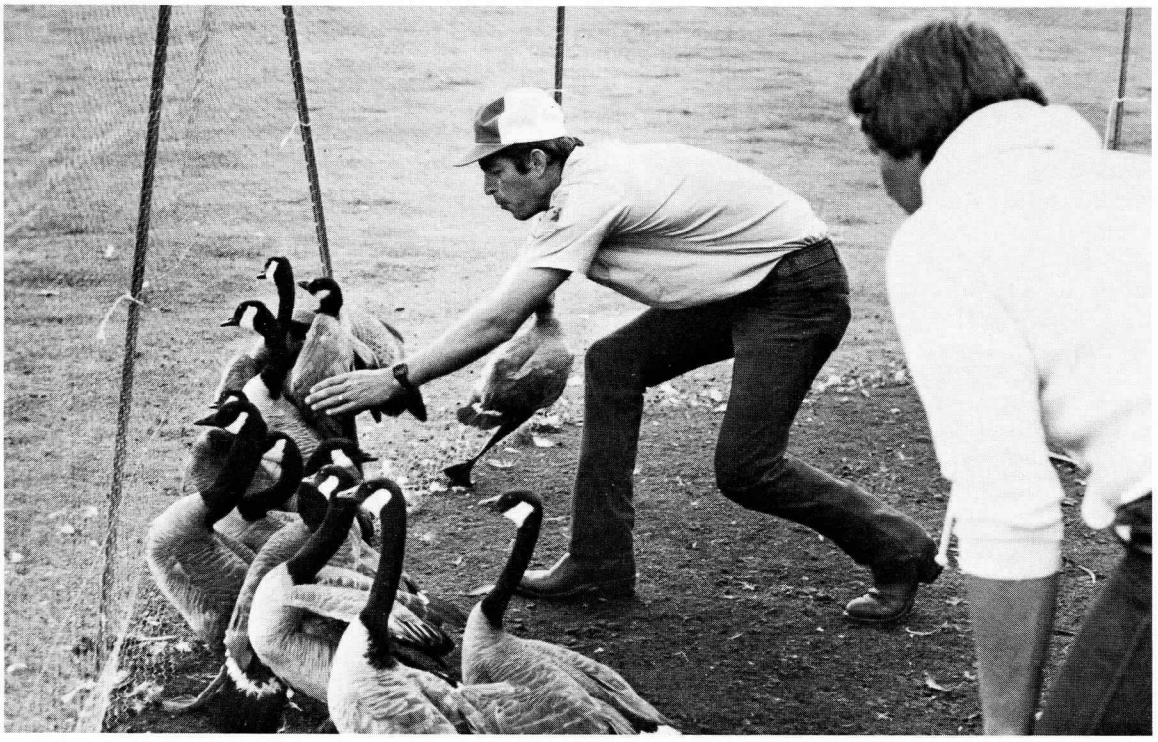
Rain Takes its Toll

Wind and rain are the forces responsible for eroding and transporting soil from place to place. Estimates from Maine's Environmental Protection Department are that one inch of rain falling on one acre weighs 220,000 pounds, and that in a normal rain each drop strikes the earth's surface at about 20 miles per hour.

When a shower begins, raindrops pack the soil surface to the extent that about 98 percent of the rain falling doesn't have a chance to be absorbed by the soil, and merely runs off.

The difference between rain landing on wooded areas and cleared land are significant. The amount of soil removed from one acre of cleared land by a one-inch rain may be 20,000 to 40,000 times as much as that washed off a wooded plot under similar conditions.

Outdoor Oklahoma



Dick Irish is about to lay hands on one of 154 honkers captured at a park on the shores of Lake Washington near Seattle. The birds were released the same day in Oregon.

Photo by John Thiebes

Washington Wild Goose Chase

Transplanted geese will have a new home in Oregon

By
John Thiebes
Staff Wildlife Biologist

A bird in the hand.

Photo by John Thiebes.

This story really begins with completion of the John Day Dam on the Columbia River in the mid-1960's. As water behind the dam began to back up, many miles of the Columbia River and the lower 11 miles of the John Day River were flooded forever. This area was home and nesting habitat for the great basin Canada goose (*Branta canadensis moffitti*), and many newly hatched goslings were in perile of displacement by the rising waters.

"Operation Mother Goose" was launched to round up the young geese, and many were relocated at Lake Washington near Seattle. They flourished in this new home to the delight, and later the consternation of area residents.

The great basin Canada goose looks and sounds much like other Canada geese with its black head and neck, white cheek patch and honking call. But its body is lighter in color than other members of the honker family, and it is one of the largest of the Canada goose clan. In addition, this subspecies is practically nonmigratory.

Small resident populations ai found throughout the state, particularly in eastern Oregon and

Birds are boxed and loaded, while a department biologist ponders where the rest of the gear is going to go. The geese survived their cardboard box confinement with no problems and most were released on the North Fork Siuslaw River.

along the Columbia River. A small flock is frequently seen on the grounds of the Oregon State Penitentiary in Salem and in other nearby areas.

This story picks up again in 1979 when the Renton Parks and Recreation District opened a park along the southeast shore of Lake Washington. The geese using this portion of the lake found the park lawns perfect habitat and quickly became common, full-time residents. They heavily grazed the lawns which soon began to take on the appearance of golf course greens.

Park personnel enjoyed the help since they no longer needed to cut or fertilize the grass. But their appreciation soon lagged as they discovered a need to hose goose droppings from walks, and to periodically harrow the beach sand to allow reasonable public use. Soon lawn use was limited to visitors wearing shoes because of the heavy accumulation of goose droppings, and park personnel began to realize that their burgeoning goose population might be too much of a good thing.

A decision was made to reduce the numbers of geese and the Oregon Department of Fish and Wildlife was offered the surplus. Early last month, department personnel arrived at the park with equipment to trap the birds, and trucks to haul them back to Oregon. On "G-Day", when the park closed at 9 p.m., a trap was constructed from fish sein and chicken-wire and was baited with bread (not a natural food, but one to which the geese had become accustomed in the park).

Biologists optimistically hoped to catch 80 geese in the first attempt, so were more than pleased when the first effort netted 120 honkers. The birds were temporarily housed in cardboard boxes and loaded aboard two one-ton flatbed trucks for the trip home.

A second attempt was more difficult. The birds had become wary and retreated to the lake for refuge. Two boats were used to slowly herd them back to the trap site, and 34 additional birds were captured. The trucks were headed back to Oregon just 12 hours after arrival at the park.

Most of the birds were released along the North Fork Siuslaw River, an area where goose numbers have traditionally been low, and a few were turned loose in the upper Willamette Valley. If the birds cooperate as biologists hope, they will begin to populate the release area and other sites along the coast and in southwest Oregon.

A smaller group of birds from the Lake Washington area were released in Douglas County last March. Although those birds have survived well, they did not nest this year.

So the story comes full circle. The geese are home to stay, and if they do their part, Oregon will soon have resident goose populations in new areas of the state.□

Dennis and Maureen Woolington, Ducks Unlimited members, band a goose before release. Great basin Canada geese are not prone to migrate and tend to form resident flocks.

Photo by Greg Bolt of The Siuslaw News.

Chukar hunters covered a lot of miles last season to find relatively few birds. But sometimes the view was worth it.
Photo by Ken Durbin.

Upland Bird Harvest Drops in 1982

By
Ralph Denney
Staff Game Bird Biologist

A severe winter followed by a cold, wet spring finally toppled the peak from upland bird populations enjoyed by Oregonians from 1979 through 1981. During each of those three years hunters took from 1.3 to 1.6 million upland birds.

Recently completed harvest surveys for 1982 revealed that 96,406 upland game bird hunters harvested 981,305 birds. This represents 15 percent fewer hunters and a 39 percent drop in harvest from 1981.

Despite forecasts for poor hunting, reduced bag limits and shorter seasons, bird hunters reported an average of 7.6 days afield in 1982, down only slightly from eight days afield in 1981. A total of 738,060 hunter days was reported in 1982.

Pheasant hunting remains the most popular upland sport with 62,531 hunters reporting time spent afield in pursuit of this exotic Chinese import. Malheur and Umatilla counties were again the most popular areas to hunt. The total statewide harvest of 213,000 birds was down 35 percent from the previous year.

Partridge hunting was difficult and spotty this past season and a real challenge to hunters who found sharply reduced populations consisting of largely older-aged birds. The 142,000 chukars reported taken was 62 percent below the 370,000 harvest of 1981. Extremely low Hungarian partridge populations resulted in a harvest of only 27,800 birds, some 72 percent fewer than the 98,000 bird all-time record harvest for Oregon in 1981.

Mountain and valley quail harvest was also down by 30 percent, while forest grouse harvest was reported 15 percent below the 1981 level. Nearly 200,000 quail and slightly more than 101,000 forest grouse were reported taken by hunters.

The cool, wet summer also reduced band-tailed pigeon and mourning dove production, and early fall storms moved many birds out of the state early in September. The harvest was 214,000 doves, down 20 percent, and 82,000 pigeons, a reduction of six percent from 1981 levels.

The accompanying table shows a more detailed harvest by region and species.□

1982 UPLAND GAME HARVEST

County & Region	Hunters	Days Use	Pheasants	Valley Quail	Mountain Quail	Chukar Partridge	Hungarian Partridge	Blue Grouse	Ruffed Grouse	Mourning Dove	Band-Tailed Pigeon
Clackamas	3,549	17,595	2,793	1,661	852	—	—	1,396	1,565	1,901	2,366
Clatsop	1,600	9,984	82	330	359	—	—	1,154	2,555	0	4,569
Columbia	2,544	18,147	897	991	1,187	—	—	1,477	5,979	4,602	4,650
Multnomah	985	4,276	836	62	0	—	—	20	79	2,401	2,998
Tillamook	2,257	12,398	102	21	1,031	—	—	870	3,882	160	6,322
Washington	3,303	17,656	2,976	1,425	538	—	—	486	1,188	7,543	938
COLUMBIA REGION TOTAL	12,392*	80,056	7,686	4,440	3,967	—	—	5,403	15,248	16,607	21,843
Benton	2,954	13,053	2,426	2,395	1,031	—	—	162	733	4,962	1,745
Lane	8,555	57,714	4,424	7,001	13,447	—	—	7,872	9,704	15,926	14,624
Lincoln	1,375	9,002	82	330	1,793	—	—	202	1,723	80	6,425
Linn	5,006	31,057	3,914	3,820	3,631	—	—	1,518	2,258	17,747	2,162
Marion	5,293	27,579	6,218	3,097	314	—	—	850	1,287	17,787	2,284
Polk	2,913	14,321	2,752	2,829	1,278	—	—	688	574	7,263	2,447
Yamhill	3,036	14,690	3,690	2,602	1,771	—	—	385	951	4,622	4,405
NORTHWEST REGION TOTAL	25,235*	167,416	23,506	22,074	23,265	—	—	11,677	17,230	68,387	34,101
Coos	1,826	10,557	367	1,156	2,712	—	—	769	871	660	10,280
Curry	718	6,179	0	743	3,048	—	—	587	614	20	4,813
Douglas	5,519	41,695	1,590	7,785	19,657	—	—	5,808	5,308	3,321	6,159
Jackson	5,786	38,504	5,974	8,921	14,994	—	—	2,590	1,921	20,869	1,938
Josephine	1,641	10,864	489	2,147	5,491	—	—	607	535	2,321	3,406
SOUTHWEST REGION TOTAL	14,423*	107,799	8,420	20,752	45,902	—	—	10,362	9,249	27,191	26,596
Crook	1,026	4,460	1,040	2,664	—	345	39	20	59	3,401	—
Deschutes	2,708	11,375	571	7,804	—	2,856	333	202	574	11,825	—
Hood River	1,026	5,585	693	165	359	—	—	1,014	951	320	—
Jefferson	2,462	11,375	2,243	3,056	—	1,073	626	121	79	11,525	—
Klamath	4,555	24,755	7,788	2,622	—	134	—	627	694	6,523	—
Sherman	1,785	8,777	2,385	1,260	—	11,135	743	40	99	960	—
Wasco	5,806	30,137	8,562	7,021	—	20,603	2,505	668	594	14,565	240
CENTRAL REGION TOTAL	17,316*	96,464	23,282	24,592	359	36,146	4,246	2,692	3,050	49,119	240
Baker	5,498	35,108	11,396	6,752	—	15,642	3,483	2,388	1,703	1,841	—
Gilliam	1,559	6,690	1,142	991	—	13,375	1,741	0	0	1,000	—
Grant	1,744	6,424	265	1,507	—	1,744	333	1,032	1,267	80	—
Morrow	3,467	17,922	12,681	2,024	—	12,762	3,796	931	792	2,001	—
Umatilla	11,161	75,147	49,377	8,528	—	8,414	6,221	2,732	3,526	12,604	—
Union	3,837	26,494	8,216	2,788	—	882	2,681	3,015	3,010	6,363	—
Wallowa	2,339	11,805	2,243	475	—	3,296	2,211	3,461	2,139	0	—
Wheeler	1,128	5,258	999	1,136	—	6,286	1,071	20	0	4,622	—
NORTHEAST REGION TOTAL	26,117*	184,848	86,319	24,201	—	62,401	21,483	13,579	12,437	28,511	—
Harney	2,400	11,743	4,587	4,832	—	5,098	176	82	20	2,921	—
Lake	2,359	10,946	2,243	6,442	—	1,457	0	40	198	5,982	—
Malheur	12,310	78,788	57,614	18,419	—	37,123	1,933	20	20	15,567	—
SOUTHEAST REGION TOTAL	16,413*	101,477	64,444	29,693	—	43,678	2,113	142	238	24,470	—
STATE TOTAL	96,406	738,060	213,657	125,752	73,493	142,225	27,842	43,855	57,452	214,285	82,744

*Total eliminates duplication by county, region, or zone.

Trouble in Our Bays and on Our Beaches

by
C. Dale Snow

I don't know if we can blame El Niño or not, but Oregon bay and razor clam diggers are in for disappointment for the next year or more.

The winter of 1982-83 will go down in the records as the year of huge seas along the Oregon coast as winter storms swept by and into California. These mountainous waves resulted in heavy beach erosion all along the coast and much of our sand and many of our foredunes were swept out to sea. The net result of this was extensive property damage to beachfront property, exposure of miles of bedrock and agate beds along the central coast and alteration or destruction of clam beds along the coast and in our bays.

Razor clams were impacted the most with nearly a complete washout at Seaside and extensive clam losses from there north, including the Longbeach peninsula. Central and south coast razor clam beds were affected to a lesser degree. The result for 1983 will be the poorest razor clam digging since records have been kept, starting in the 1940's. Until this year, an average of 9.5 razor clams per digger on Clatsop County beaches was considered to be a poor year. This year through the first minus tide series, the average number of clams per digger in that area has ranged from 0.5 clams at Seaside to 2.4 clams per digger for the rest of the area north to the Columbia River.

Terry Link, staff razor clam specialist, reports that the few clams on the beach are growing very poorly and this condition has also been noted in Washington. This poor growth is due to very little plankton in the water for clams to feed on. There is little doubt that this low food productivity is related to the El Niño or warm currents phenomenon. Historical records according to Link indicate that clam production fell off following past El Niño occurrences.

The same winter storms that so seriously impacted razor clams also altered some bay clam beds. This is particularly true in Netarts Bay. Much sand was carried into that bay by the storms and buried some of the beds and washed out others. However, the major problem at the moment is from the damming effect in the lower Netarts Bay that prevents effective draining, and many traditional clam digging areas are not being exposed at low tide. The clams are there, however, and in time will again be available.

More serious than the foregoing has been the failure of gaper clams (also called blue, horse, horseneck, blueneck or Empire clam) to successfully spawn since 1975. The 1975 spawning of gapers was the last major successful year for this clam. The gaper clam, unlike cockles, softshells or butter clams, spawns in the winter starting in late December and continuing through February and into early March. You would expect a winter spawning clam to be somewhat tolerant to reduced salinity; unfortunately this is not true. Workers at Oregon State University have demonstrated that when the salinity (salt content of the water) drops below 28 parts per thousand (normal seawater is 32 parts per thousand), the free-swimming larvae die.

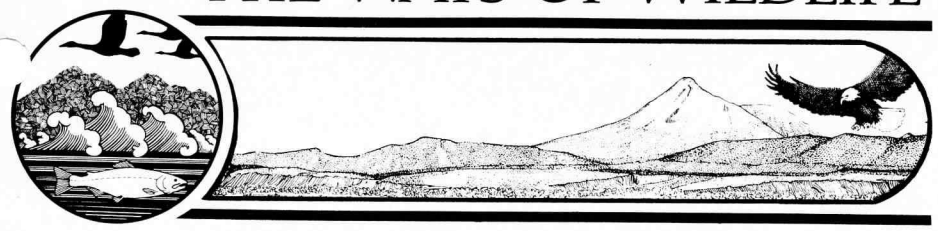
The sexes of clams are separate and reproduction occurs by the release of sperm and eggs into the water for chance union. After fertilization of the egg, development starts and for the next 28-30 days, eggs and/or weakly swimming larvae remain suspended in the water. As the shell develops they become heavier and sink to the bottom where with the aid of a tiny thread-like organ they attach to a stick, eel grass or other object and proceed to work their way into the substrate. If, during this time in the water column, the salinity drops below 28 parts per 1000, the larvae die. The same is true if the animals fall out on unsuitable bottom. Fortunately, each female clam produces several million eggs per spawning.

The gaper clam, unlike the razor clam, is a very slow growing clam and does not reach a size the bay clam digger wants for three to five years. The most desirable sizes are attained after five years. This slow growth coupled with periodic successful spawning is the reason for the reduced bag limit for this species. It is also the reason some gaper clam bed populations can be greatly reduced in a few years. Fortunately, there are extensive beds of gaper clams that are never exposed by tidal runout and it is these beds that will repopulate the intertidal beds when water conditions allow successful reproduction.

Two major gaper clam beds are showing the effect of reproductive failure and slow growth. These are the beds at Happy Camp in Netarts Bay and under the south end of Yaquina Bay Bridge. Both beds are exhibiting the early symptoms of problems to come. Unfortunately, the only cure is one we have no control over — favorable hydrological conditions and time. To stop digging would have no positive effect but would only allow the remaining clams to grow or die from other causes and thus be lost to clam diggers. Replenishment of the intertidal area will come from subtidal populations that are virtually untouched. These subtidal clams are our "ace in the hole."

We heard some criticism in 1975 when we did not stop clam digging in some of the beds where clams had set out in high numbers. Our critics thought the clams should be allowed to "grow up". Unfortunately nature does not operate that way. Most of the clams were stunted and would have died from overcrowding and worse yet this winter's storms would have destroyed many of them. As it is, a lot of that year's set was harvested, and furnished both recreation and food for many people.

The clam populations, both razor and gaper, will come back when we once again get the cooperation from the weather.□



Learning By Experiencing

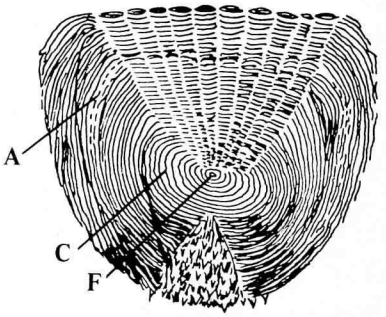
Fish Show Their Age

Determining the age of fish is an important part of fisheries management. Knowing how old fish are in a population helps biologists determine how well the population is doing. Examining fish scales is one way to find out how old fish are.

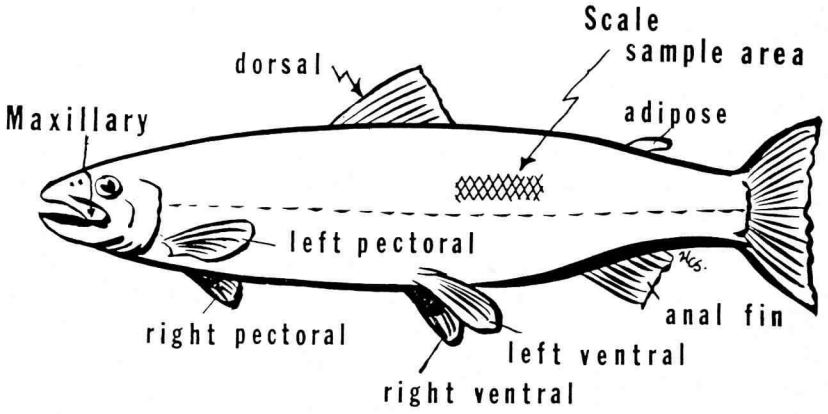
Most fish are born without scales, however, before long the scales form. As the fish grows, the scales increase in size while the number of scales remains about the same. Growth begins at the focus near the center of the scale. As growth proceeds, fine ridges called circuli are laid down in a circular pattern around the focus. The circuli are widely spaced when food is plentiful and growth is rapid, and closely spaced when food is scarce and growth is slow. One year's growth is usually revealed as a series of widely spaced spring and summer circuli followed by a series of closely spaced fall and winter circuli. The pattern is repeated each year, however, in temperate regions such as Oregon's Willamette Valley and coastal area, this pattern may not always follow the seasons so closely. The outer edge of a series of closely spaced circuli, called the annulus, represents the end of growth for that year. The age of the fish is determined by counting the number of annuli (plural for annulus). Often the circuli are so close together they form dark rings that can be easily counted.

With the aid of a good hand lens, fish with large scales such as carp or bass can be aged as you catch them. Remove some scales from the fish using tweezers (or your fingers). A good place to get well-developed scales is just above the lateral line and below the dorsal fin. When examining the scale, it works best to place it on a flat glass slide or piece of clear or colored plastic. Any flat surface will work if the light is right; you can adjust for light conditions.

Examine the scale with the hand lens, using the drawing as a guide. Look for the closely-spaced circuli, sometimes so close together that it appears they do not reach all the way around the scale, to identify the annuli.□



Typical fish scale.
A-annulus, C-circuil, F-focus



Mail scales to:
ORe. Dept. Fish and Wildlife
P.O. Box 1628
Corvallis, Oregon 97330

Hungry Invader

The gypsy moth is a relatively new migrant to our state, but one we could well do without. An article entitled "Coping With the Gypsy Moth" which appeared in a recent issue of VIRGINIA WILDLIFE provides some revealing information on these new pests. Here are a few highlights from author Joel Artman's story.

The gypsy moth is yet another example of misdirected zeal, Artman says. Back in 1869, a French scientist brought the gypsy moth to Medford, Massachusetts, hoping to cross it with the silk worm to produce a better breed for the industry in the U.S. Genetically, this simply won't work. But, as so often happens with supposedly confined animals, some of the moths escaped. Since then they have spread throughout New England, New York, New Jersey, Pennsylvania, Maryland, and into Virginia. This spread is commonly assisted unwittingly by man. The moth egg mass may be deposited on campers, car frames, loads of logs, and myriad other things that are moved about the country.

So what does this have to do with wildlife? A single egg mass may contain from 100 to 1,000 eggs so the reproductive potential is large. As the eggs hatch in the spring, the larvae start eating, completing their munching by about late June. After the last of several molts, they become a pupa and in 10 to 14 days the adult emerges. It does not eat, but directs its energies toward producing more moths. It is during the larval stage that the trouble occurs. When fully grown, one larva will eat about one square foot of leaf area per day. During the summer of 1980, gypsy moths stripped the foliage from trees covering 5.1 million acres in the northeastern U.S.

While they prefer oak, they will take on most anything, including conifers and most bushes. Artman notes seeing thousands of acres of the Blue Mountains of Pennsylvania stripped of foliage in July. The only leaves evident were those on the yellow poplar which the moth leaves alone. Artman says, "Aside from the poplar foliage, the area appears as it would be in winter. Even the understory vegetation, the greenbriar and huckleberry, is leafless. The defoliated area is strange to walk through. There is no shade — no way to escape the hot July sun. No birds sing. In fact, it is not just the birds; all wildlife has vacated the area."

He adds that the fire hazard is extreme and the area is eliminated as a place for tourists to visit. The hardwoods will put on a second crop of leaves in the fall, but the conifers often die. Even the hardwoods will succumb after two or three heavy years of defoliation.

He suggests that wide-scale spray operations are probably not a practical solution although chemicals may be cost-effective in areas of high human use.

Actually, the gypsy moth carries a predator within itself. It is a virus that will manifest itself when the moth population is under stress. However, that stress normally comes only when the insect has eaten itself out of house and home before completing larval development. Normally this occurs after two or three years of heavy defoliation, according to Artman.

In the remainder of the article he talks about some of the control methods being employed and some of the side effects of the presence of the gypsy moth. He concludes with this observation: "The prospects of continued invasions portends trying times ahead for the Commonwealth, its residents and visitors."

From all we can learn, Oregonians have good reason to hope we do not have the same sort of future to anticipate.□

Ron Shay

Game Officer Assailant Given Ten Years

About one year ago, Oregon State Police Trooper Lindsay Ball was making a routine patrol on the Sauvie Island Wildlife area. He came upon three anglers and made the standard request to see their angling licenses. As it turned out, they were from Washington and not all of them had the necessary licenses. One of them went to his vehicle, supposedly to get a license, and pulled out a tire lug wrench which he used to hit Trooper Ball on the side of the face and head.

The three then attempted to flee, but were apprehended before getting off the island. In a recent story in the OREGONIAN datelined St. Helens, it was reported that the assailant, James Kenneth Carrol of Vancouver, WA. was sentenced by Columbia County Circuit Court Judge James A. Mason to ten years in the Oregon State Penitentiary with a requirement that he serve at least fo[illegible] years. In addition, he is to pay the legal and medical bills involved with the incident which are estimated to be approximately $11,000.

Trooper Ball has been back on duty after being laid up for some three months as a result of the assault.□

Deschutes Update

As of July 17, the Oregon Wildlife Heritage Foundation Deschutes acquisition fund stood at $809,000 according to Allan Kelly, Executive Secretary of the Foundation. Allan asked us to pass along a word of thanks to OREGON WILDLIFE readers for their support. He said the response from our readers has been significant. We'll hear more from Allan about the campaign in a future issue.□

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