OREGON STATE GAME COMMISSION BULLETIN

AUGUST 1970

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RON E. SHAY, Editor
H. C. SMITH, Staff Artist
A. L. MILLER, Photographer

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The Cover

Bill Hall and Chet Kebbe of the Game Commission staff introduce one of the recently arrived sea otters to his temporary home while an earlier arrival frolics in the invigorating waters of the Pacific. State Police officers with their patrol dory provided transportation from shore to the pen.

Photo by Al Miller

HUNTER SAFETY TRAINING PROGRAM

Instructors Approved

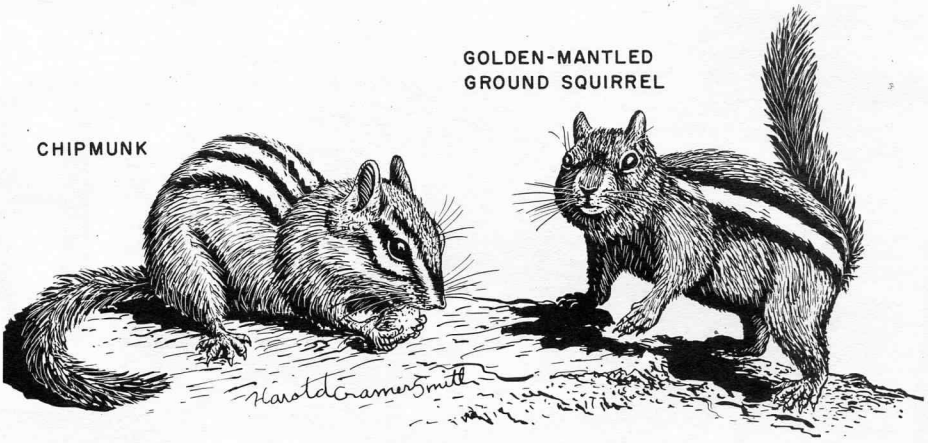
Month of June	18
Total to Date (Corrected)	1,713

Students Trained

Month of June	385
Total to Date	152,948

Firearms Casualties Reported in 1970

Fatal	0
Nonfatal	8



THE CHIPMUNKS

Some authorities list more than half a dozen different variations of the chipmunk in Oregon. There is considerable color and size difference in individual animals, depending somewhat on where they live. Generally, the chipmunks of Oregon fall into two main groups. Both groups have basically the same markings with an overall brownish appearance and black and white stripes running from the shoulders to the base of the tail. Chipmunks have a black stripe bounded by white running along each side of the head past the eye. This head stripe is on no other member of the squirrel family.

THE TOWNSEND'S CHIPMUNK

These dark varieties of the chipmunk are found mainly in the western part of Oregon, though a slightly grayer version inhabits central Oregon adjacent to the Cascades. Large members of this group will grow to ten inches in total length. They normally are a rich reddish-brown color beneath their stripes.

Like other members of the chipmunk family, they live mainly in the ground but will climb trees when escape is necessary. During the winter months they may hibernate in colder areas but where the weather remains mild they may be out foraging at almost any time.

Food of the chipmunks consists almost entirely of vegetable matter including nuts, acorns, seeds, berries, and other fruits, but they do take limited numbers of insects and other small animal life.

The young of the chipmunk usually do not appear above ground until May or June. The average family is three or four.

THE KLAMATH CHIPMUNK

This is the smaller, lighter-colored relative of the Townsend's chipmunk. These little chipmunks are found in most of Oregon east of the Cascades except in the open areas of the Columbia Basin. Along the Cascades they are found in some of the same areas as the Townsend's.

Generally, they are more contrastingly marked and have a lighter and more grayish overall coloration than their western cousin. They range in size from about eight inches total length down to the tiny sagebrush chipmunk which may measure only about five inches.

Food habits are much the same as those of the Townsend's chipmunk as are the living and breeding habits. Klamath chipmunks tend to go into complete hibernation during the winter months, probably because of the colder area in which they live.

All chipmunks have a great number of enemies including coyotes, badgers, foxes, bobcats, weasels, hawks, and small boys, to mention but a few. Chipmunks may be detrimental where they become too numerous because of the grain and tree seeds they eat, but normally this is not considered a problem. Like all rodents, they do at times carry various diseases dangerous to human beings.

THE GOLDEN-MANTLED GROUND SQUIRREL

This friendly little fellow is probably the most familiar of the ground squirrels in Oregon east of the summit of the Cascades. Though he is often mistaken for a chipmunk, the golden-mantled squirrel may be readily identified by his striped body, bright golden shoulder patches and the lack of a stripe along his head. He is generally larger than the chipmunks in the area he inhabits, but his habits

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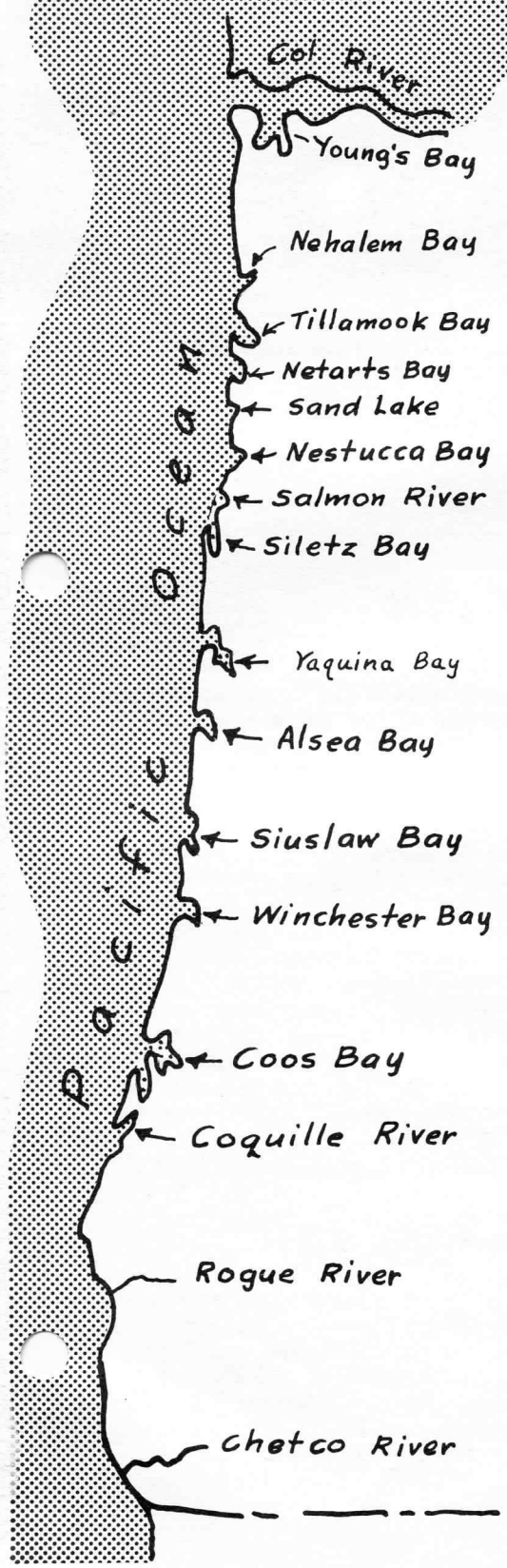
ESTUARIES

Where Rivers Meet The Sea

by ROLLIE ROUSSEAU
Staff Biologist, Basin Investigations



The tidal area of a coastal river, where fresh water and salt water mingle, is an ESTUARY, a uniquely dynamic and biologically productive zone, part river and part sea. Call them bays if you like. The place where you and I dig clams — or launch a boat for fishing the ocean — or watch cargo freighters pass the jetty — or lazily troll a lure for fall salmon — or hunt waterfowl in a winter storm.

Estuaries mean different things to different people. To some they are quiet, isolated, untouched scenic areas; to others they provide dumping grounds for dredging spoil and solid wastes; or nursery for fish and shellfish; or site for marina, industry, and home.

Oregon has 14 bays totaling about 41,000 acres. The largest of these, exclusive of the Columbia River, is Coos Bay which contains over 9,500 acres. The Salmon River Bay, smallest and probably most pristine, is less than 500 acres. Estuaries account for less than one-tenth of 1 percent of Oregon's total area.

Because of their uniqueness and scarcity, the **estuarine zones are probably Oregon's most valuable geographic areas.** No two are alike. Each differs in size, shape, depth, salinity, currents, and soil types. All abound in aquatic life.

Productivity

Estuaries are a variety of complex ecological systems totally interrelated to form an environment that we are just beginning to understand. They are a remarkable system for the containment and efficient utilization of organic matter, water, minerals, and sunlight.

The salt water wedge pushed along the estuary bottom by the incoming tide brings in rich nutrients from the ocean. Currents and tides circulate and recirculate fresh in salt water, thus distributing these rich foods throughout the sloughs, inlets, and lagoons.

The estuary itself is also a producer of nutrients. Microscopic plants flourish in the water. Salt marsh vegetation, nourished in the rich waters brought from the ocean at flood tide, produces enormous yields of organic matter. In addition mud flats and shore areas alternately covered and exposed as the tides change produce a variety of small animal life such as worms, snails, and insects upon which larger organisms feed. In turn these organisms are the foundation for the food chain that is so vital to fish and wildlife production.

Because they trap, produce, concentrate, and recycle abundant nutrients, estuarine areas exceed by several fold the organic production of our richest farmlands. Nowhere in Oregon can we find the variety of fish and wildlife that inhabit the coastal zone.

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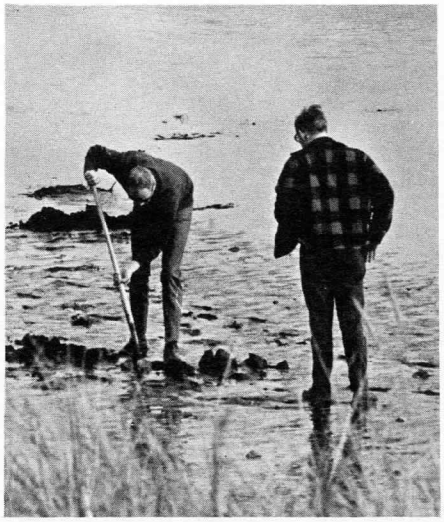
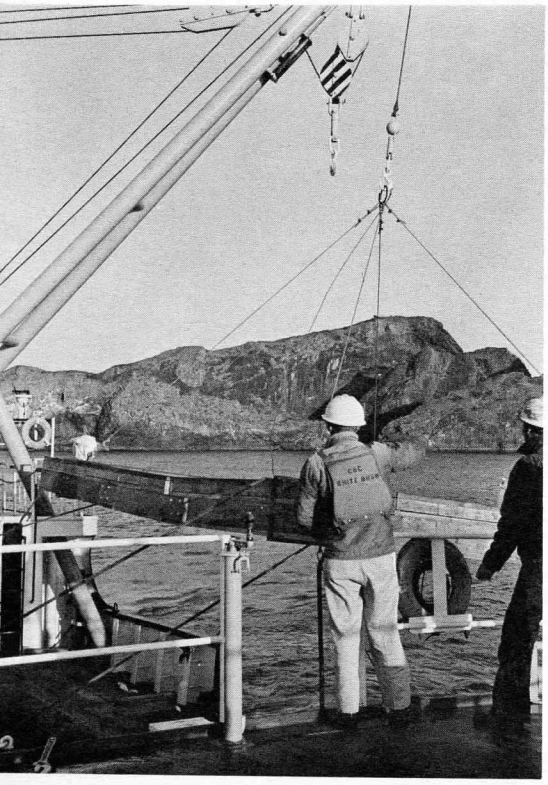


A prime value of estuaries is the production of shellfish. A variety of clams inhabit most bays and provide enjoyment to many people.

After unloading from the plane the new arrivals were rinsed with fresh water, courtesy of the Port Orford Fire Department.

The U. S. Coast Guard Cutter White Bush set a 2½-ton anchor and placed the holding pens in Nellies Cove.



The Otters Return

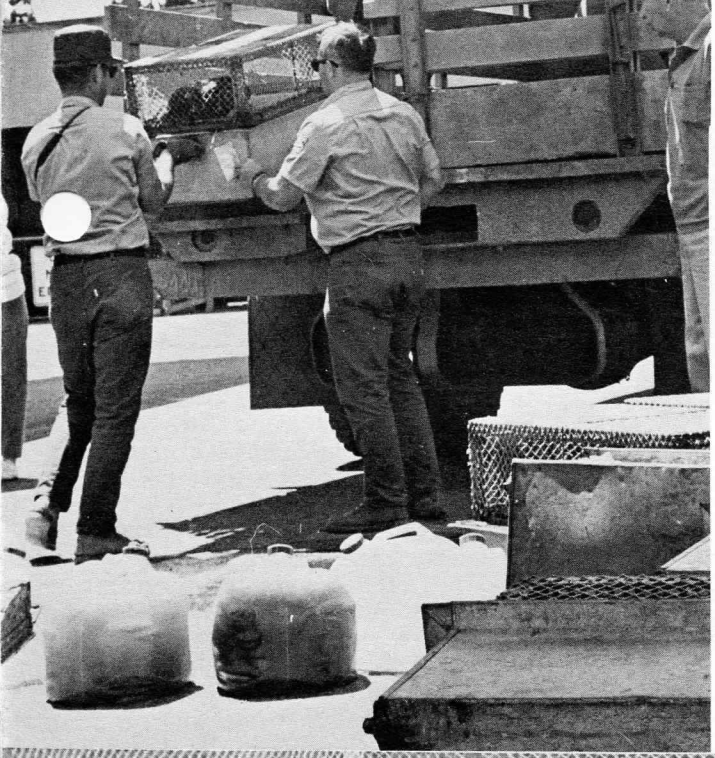
After some 100 years, sea otters are again in Oregon waters. On July 18 thirty-one of the sleek sea dwellers arrived via air cargo at the Port Orford airport. Shortly after their arrival and wetting down they were swimming happily in two specially constructed pens just offshore from Port Orford.

The pens were set up to allow the animals to get their thick, insulating fur back into good condition following their eight-hour airplane journey in a few inches of water. Their fur is their protection from the cold waters of the ocean since they do not have a layer of fat such as other marine mammals.

Though there had been plans to hold them up to a week, giving them plenty of food and rest, the new residents arrived in such good shape it was decided to release them on Monday, the 20th. Two animals did succumb to the rigors of the trip, leaving 20 females and 9 males to start the Oregon colony.

The project has been through the cooperation of the Alaska Fish and Game Department and the Atomic Energy Commission with an assist in placing and anchoring the pens by the U. S. Coast Guard Cutter White Bush.

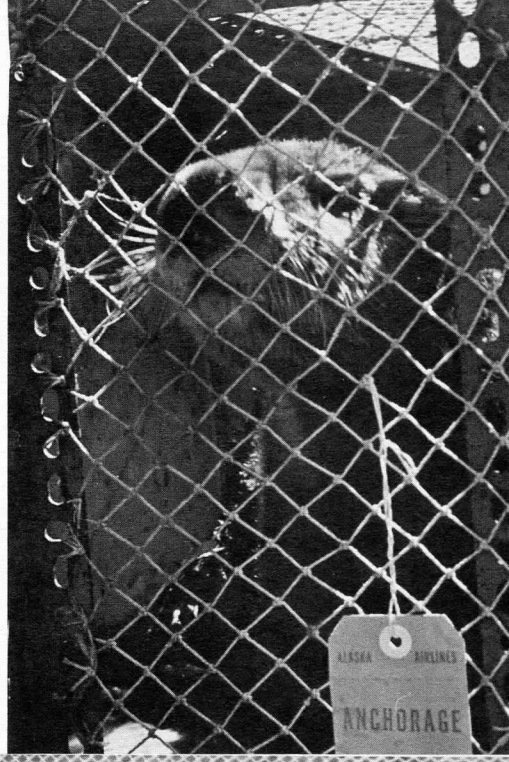
The animals are surplus from a herd of an estimated 50,000 in Alaskan waters. Since the otter has only one pup every two years, it is not expected that the population will grow rapidly and no commercial use of the animals is anticipated. The effort is directed at once again establishing the unusual and interesting mammals in Oregon waters that they once inhabited.

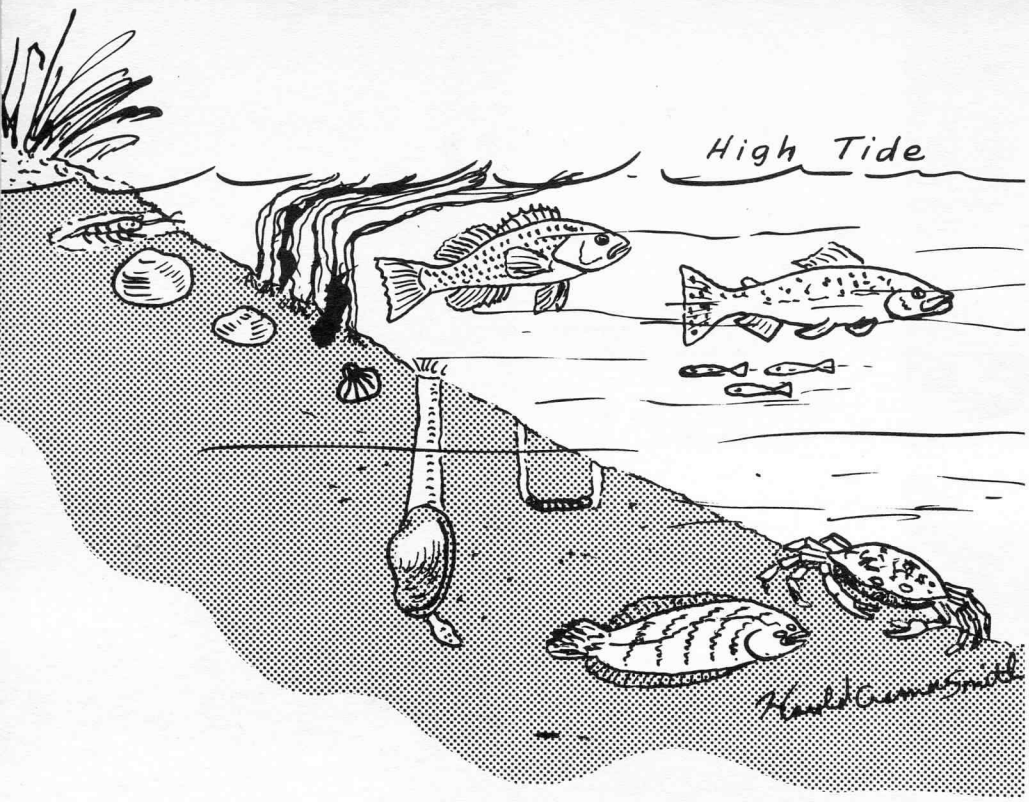


To the left — Getting loaded aboard the ground transportation to the seaborne pen.

To the right — Awaiting ground transportation.

Below — Scrubbing and playing in the temporary quarters.





Estuaries are complex ecological systems that trap, produce, and recycle abundant nutrients which provide the organic production to support many important varieties of fish, shellfish, and wildlife.

ESTUARIES

(continued)

Shellfishes

A prime value of Oregon estuaries is their production of clams, oysters, and crabs for recreational and commercial uses. Of the 14 marine estuaries, 7 can be called good, 5 marginal, and 2 of no importance as producers of shellfish.

Hard shell clams including cockles, gapers, little necks, and butter clams are present in the tidal zone and deep water areas. Soft shell clams are most frequently found in sandy mud bottoms in the upper tide flats.

Dungeness crabs occur throughout Oregon estuaries. Immature crabs are found in abundance on tide flats the year around, indicating bays are important nursery areas for this species. A significant offshore commercial fishery and inshore sport fishery occur on the tasty crustacean. Oysters are another table delicacy found completely within the estuarine zone. Native stocks exist only in Yaquina Bay but transplanted oysters occur in Yaquina, Netarts, Tillamook, and Coos Bays. Oyster crops valued at $5,000 per acre can be produced annually under proper salinity levels and water quality.

Fish Life

The value of estuaries to fish life cannot be overemphasized. Salmon and steelhead are largely dependent upon water quality and food production in estuaries. Shad and striped bass spawn and rear in the bays, and sturgeon are common residents. Sea-run cutthroat feed on their way to and from the ocean. Herring, which are the major bait for salmonids, need these areas for successful spawning. A variety of other fishes, such as perch, flounder, and cod, are greatly dependent upon estuarine habitat for spawning, rearing, and feeding.

Oregon's most important fisheries occur in the coastal zone. The sport and commercial salmon fisheries not only provide residents and tourists several hundred thousand recreational days, but in addition they add many millions of dollars to the economy annually. Small but important fisheries occur for striped bass and shad on Coos, Umpqua, and Siuslaw Bays. Flounder, cod, and perch provide high angling values. With increased demand for greater angling opportunities and growing need for food fish, coastal fisheries will be subjected to greater pressures in the future.

Waterfowl and Furbearers

Water areas, mud flats, and marsh vegetation in Oregon bays provide important migration, feeding, and resting grounds for thousands of ducks, geese, and swans. Pintail, widgeon, scaup, canvasback, scoter, redhead, ruddy, goldeneye, bufflehead, merganser, and other ducks are common. Limited numbers of whistling swan winter in bays like Nehalem, Nestucca, and Siletz. The black brant is the most important goose. Brant migration occurs wherever eel grass beds are common.

Flocks of shore birds — the plovers, sandpipers, and others depend on estuarine habitat and furnish enjoyment for thousands of bird watchers.

Furbearers such as beaver, mink, muskrat, and otter are common residents. The harbor seal and occasionally the sea lion are marine mammals found in Oregon estuaries.

Problems

As rich as estuaries are in resources for man and nature, they can be destroyed by man's activities. **Nowhere is competition for environment and associated resources more acute than in our estuarine zone.** They are being threatened by population pressures and technological advances. Their fate has been one of steady deterioration and destruction. Relatively few people in Oregon are completely aware of how man's activities influence the estuarine environment or of the total impact of these activities on the economic and social lives of our people.

Conflicts of interest among incompatible uses are common. Major conflicts arise over pollution, logging methods, dredging, and filling of tide flats as pressures for urban and industrial development compete with concern for open space, recreation, and ecological needs. If population growth continues, more demand will be placed on the estuarine environment. With accelerated industrial expansion, greater production and use of power, more shipping and larger vessels, and increasing time for recreation, estuaries and their adjacent coastal areas will be called upon to serve expanding urban needs in many ways.

Perhaps the biggest threats are the filling of tide lands, draining of marshes, and dredging activities which permanently scar and upset the balance of the estuaries. Poor logging, mining, and road construction practices in upstream tributaries have caused soil erosion to forest

lands. Consequently, heavy silt loads are deposited annually in estuarine channels and lagoons. To maintain navigation depths and shipping lanes, periodical dredging is required. Not only is the dredging operation sometimes damaging to fish and wildlife habitat but the improper placing of dredge spoils can be disastrous to these resources. Dredging and spoil deposition are of special concern because of their direct environmental intrusion on fish, wildlife, water, esthetics, and recreational values.

In some instances estuaries also have been used as sewers for industrial effluents and untreated municipal and boat wastes. Log dumping and storage can also degrade water quality. Thermal pollution, too, may be a future danger to the productivity of an estuary.

Nature herself is often harsh on bays. Strong winds scour the bottom, muddy the waters, and pile silt and sand in new places. Sometimes it is difficult to tell whether the damage to the estuary is the product of man's or nature's activities. The principal difference is that man's damage can be prevented.

Estuarine Management

If man's progress is to be compatible with the estuarine ecology, he must exercise judgment in how he develops the land and water area. Controls of water quality, physical modifications, and land-water uses are important factors that must be considered in estuarine management.

Water quality standards have been adopted in recent years to reduce domestic and industrial pollution in the coastal zone as well as in the entire state. Biological pollution is always a threat to fish and wildlife. However, control of physical pollutants such as shoreline modifications and tide land fills is the greatest immediate concern.

Land fill proposals must be carefully reviewed. Once a productive mud flat is converted to dry land there is no reclaiming of this lost resource. State and federal fish and wildlife agencies are working closely with other governmental bodies and local people on proposed projects attempting to obtain adequate protection for these resources.

The controversy over tidal ownership and public rights must be resolved. In 1969 the Washington Supreme Court ruled, in the now famous Lake Chelan case, that "the public has the right to go where the navigable waters go, even though the nav-

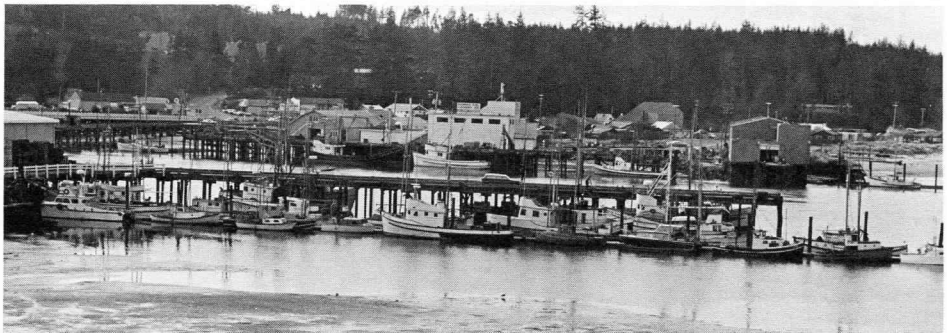
(continued next page)

Estuaries account for less than one-tenth of 1 percent of the state's total area. No two are alike; each differs in size, shape, depth, salinity, and currents but all abound in aquatic life.

Spoils deposition from maintenance dredging of navigation channels and filling of tide flats is probably the greatest threat to fish and wildlife habitat. Close coordination with public agencies can avoid loss of valuable tidal production areas.

Decisions must be made on how we develop our land and water areas if man's progress is to be compatible with the estuaries.

Bay areas provide the harbors and departing points for many of the ocean commercial and sport fisheries.



ESTUARIES (continued)

igable waters lie over privately owned lands." The regional federal solicitor commented recently that regardless of the source of title to tide lands, the owners thereof hold such title subject to the public rights of commerce, navigation, and fishing derived from English common law and the Oregon Admission Act. If the Lake Chelan case and solicitor's opinion are upheld, they could have an effect on every proposed fill and estuarine development.

Estuaries can serve multiple use functions such as navigation, industry, fish and wildlife, recreation, and scientific research without seriously impairing their value. But decisions must be made on what uses are to be permitted, where they can best be located, and what areas should be retained in natural production.

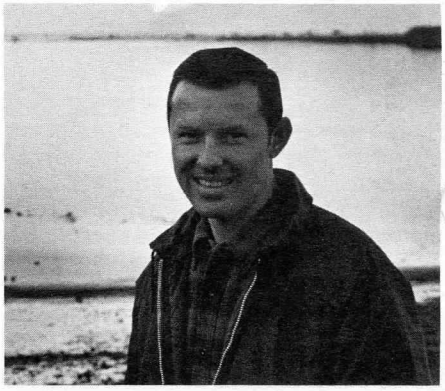
Planning

Comprehensive land and water use planning is the obvious key to multiple use development in the estuarine zone. Plans must be coordinated by local governing bodies; however, the people of the state and nation must also have a voice in the ultimate decisions through appropriate agencies.

The Yaquina Bay Planning Council has recently completed such a study and plan. It is the first attempt on the part of **local government** on the Oregon coast to integrate ecological factors into a land and water use study. The plan emphasizes protection of natural marine resources while recognizing the need for balanced development of the port, industries, recreational facilities, and maintenance of an attractive residential environment.

Other coastal communities must plan for man's needs now within the capabilities and limitations of the natural environment. Zoning regulations are needed to protect marine production areas and to restrict development upon unstable lands that are naturally exposed to changing river channels and other forces. Multiple use planning must recognize important fish and wildlife habitat areas and consider ecological relationships that exist in an estuarine environment if these vulnerable areas are to survive the demands of society.

Land, water, timber, and wildlife resources must be carefully managed to insure greater use for the benefit of all residents of the coastal area, state, and nation, now and for the future. The final destiny of our estuaries will be determined by the concern, wisdom, and foresight of the people of Oregon.



About the Author

Rollie Rousseau is a native Oregonian born and raised in Portland. After receiving his B. S. degree in fish and game management from Oregon State University in 1958, Rollie served the Game Commission in several different positions as a biologist in information-education, basin investigations, and at various field assignments. Finally, in 1962 he took over as district biologist in the Newport area where he was located until promotion moved him to the Portland office of the Commission last year.

Rollie's feel for and concern regarding estuaries were developed during his residence at Newport and he has incorporated some of his ideas in our feature article.

New Commissioner Appointed

Governor Tom McCall appointed John Daniel Callaghan, a Salem attorney, to serve a five-year term on the Game Commission starting July 20. He succeeds Joe Smith of Klamath Falls whose term expired. Mr. Smith served on the Commission for ten years.

Commissioner Callaghan lists his hobbies as fly fishing, hunting, and photography. He is active in numerous fly fishing clubs, the Steamboaters, Audubon Society, The Wilderness Society, and the National Wildlife Federation in addition to several other outdoor-oriented groups.

CHIPMUNKS (continued)

are much the same as those of the chipmunk. His total length will sometimes reach nine to twelve inches.

Like the other squirrels, he feeds mainly on vegetable matter, but will eat considerable amounts of meat if it is available. If confined together, golden-mantled squirrels have been known to kill and eat the smaller chipmunks.

In autumn they enter their dens and hibernate until the first warm days of spring, the actual dates varying according to the climate in the area where they are living. Their young are usually born in June or July and an average family consists of four to six.

Golden-mantled ground squirrels are among the friendliest and most attractive of our ground squirrels. They do little damage unless they manage to get into stored supplies at camps or mountain cabins. They add much to the interest of a camping trip with their scurrying about for available handouts. As do all rodents, they carry various insect pests and care should be taken when they are being fed or petted.

Editor's Note — This is the first in a series of articles on the small animals of Oregon. As we mentioned last month, these miscellaneous species are currently not protected by any laws and no agency has any jurisdiction over them. The Game Commission is hoping the Legislature will broaden the Commission's authority to allow appropriate management, protection or regulation of certain of these creatures in limbo.

OREGON STATE GAME COMMISSION

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