

OREGON STATE  
GAME COMMISSION

# BULLETIN

FEBRUARY 1970



# OREGON STATE GAME COMMISSION BULLETIN

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## The Cover

Fish killed by pollution. Our feature article discusses the relationship of fish, wildlife, and pollution.

## HUNTER SAFETY TRAINING PROGRAM

### Instructors Approved

Month of December .....	9
Total to Date .....	3,828

### Students Trained

Month of December .....	186
Total to Date .....	149,531

### Firearms Casualties Reported in 1969

Fatal .....	6
Nonfatal .....	55

## Commission Okays 1970 Season Opening Dates

Following a public meeting in January the Oregon Game Commission approved opening dates for the 1970 deer, elk, and upland game bird seasons.

The buck deer season opening will be Saturday, October 3. The Rocky Mountain elk season will open October 31 while the season on Roosevelt elk will open November 14. Hunters will have an October 17 opening for pheasants and quail while the opening date

for the chukar partridge season will coincide with the general deer season, October 3.

The Commission set the opening dates early in the year to provide time for Oregon hunters to set their vacation periods to coincide with the seasons of their choice. Length of the various seasons, bag limits, and other regulations for the 1970 hunts will be established following a public hearing June 6.

## Anglers to be Surveyed

During the next 12 months approximately 20,000 licensed Oregon anglers will receive questionnaires asking for angling information.

In the most comprehensive survey thus far undertaken, the Game Commission is attempting to obtain detailed information on the catch and number of recreational days provided by Oregon's sport fishery. To accomplish this the Commission is asking for cooperation from a randomly selected group of license purchasers.

Each month a detailed form will be sent to one to three thousand anglers asking their angling effort and catch the preceding month. A different group will be polled each time.

Success of the survey is highly dependent on the cooperation of the recipients of the questionnaires. Obviously, accuracy is essential. In addition, **a good return of the materials is extremely important** because of the small sample of individuals being queried.

It will take a bit of time to fill out the form but time is all the angler has to put out. Return postage has been prepaid. Follow-up letters will be sent to those persons not returning the questionnaire in a given length of time to try to get as many returned as possible.

The survey has been designed cooperatively by personnel of the Game Commission and the Department of Statistics at Oregon State University. No law enforcement use will be made of the data obtained but the results will be valuable in formulating fishery management plans for the future in Oregon.

Accurate, prompt response by those individuals selected will be the key to the success of the survey.

## Coastal Salmon Catch

Almost 309,000 sport fishermen landed over 255,000 salmon at ten popular fishing ports along the Oregon coast during the 1969 summer months.

The 1969 catch of almost 220,000 coho is below the 257,000 coho taken in 1968 but the 31,200 chinook landed is an increase from the 24,800 chinook reported taken the previous summer.

Winchester Bay produced the highest catch of any port along the coast with more than 63,400 salmon landed by just over 60,500 anglers.

The sport catch at both Depoe and Yaquina Bays compared favorably with the past season catch. At Depoe Bay 38,400 anglers boated just about 28,200 salmon and about 56,200 anglers worked the offshore waters at Yaquina Bay and reported taking 30,700 salmon.

Both the number of anglers and catch were down at the mouth of the Columbia. At this popular sport fishing center about 49,800 anglers landed 61,100 salmon at Oregon ports at the Columbia jaws.

At Coos Bay, the fifth most productive salmon center along the coast, about 34,100 anglers boated 29,300 fish. Angling pressure was up slightly from 1968 but the catch fell off slightly.

Other ports where records are maintained include:

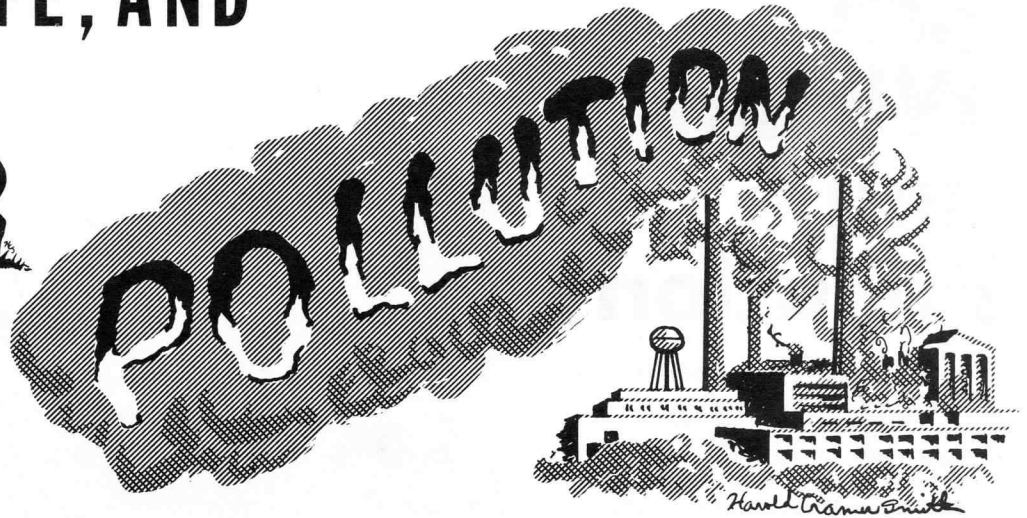
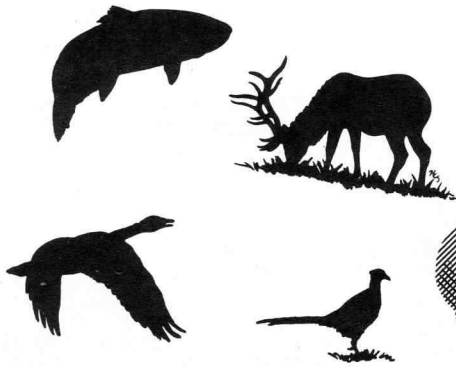
	Anglers	Fish
Cape Kiwanda .....	15,700	11,100
Siuslaw Bay .....	15,400	9,800
Garibaldi .....	12,000	9,400
Brookings .....	14,300	9,100
Gold Beach .....	12,300	4,700

## Hibbard Re-elected Chairman

George Hibbard, Game Commissioner from Oregon City, was re-elected chairman of the Commission for the next year. Commissioner John Amacher of Winchester was picked to succeed Pat Metke as vice chairman for 1970.



# FISH, WILDLIFE, AND



by Cliff Hamilton  
Conservation Education Biologist

For centuries man has used the air, land, and water as a convenient means for disposing of waste materials. The environment has absorbed countless tons of gaseous, liquid, and solid wastes from our rapidly expanding technology and population. With this expansion man has produced wastes faster than nature can take in and reprocess them. These wastes often produce changes in the environment that destroy other forms of life about us.

To survive, all forms of animal life require a supply of food, water, and shelter. Serious consequences result from any reduction of the amount or quality of these three basic requirements. Pollution in its many forms does just that.

Pollution has plagued man for years and the various aspects of it are too numerous to count. Few people agree just what constitutes pollution. To some it is anything that changes the air, land, or water from its natural or pure state. Others feel that some part of the environment must be defiled and made unfit or undesirable for use by man or animals before it can be classed as polluted. Virtually everyone does agree, however, that unchecked pollution will lead to disaster for Oregon's fish and wildlife resources.

At the present time water pollution is the most serious threat to wildlife, followed by air pollution. The pollution of land areas is not currently a great problem to wildlife. It may become one, however, unless new methods of disposal or reclamation are found.

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Using heavy equipment in or near streams can cause siltation of spawning beds and suffocation of fish eggs already in the gravel.

## Water Pollution

The forms of water pollution can be divided into four categories: mechanical, biological, chemical, and thermal. Each is separated from the others by its source or the action it has on the aquatic environment rather than by the effect it causes.

Mechanical forms of water pollution affect aquatic life by their physical presence. Dams, logjams, highway culverts, silt, and litter are a few of them.

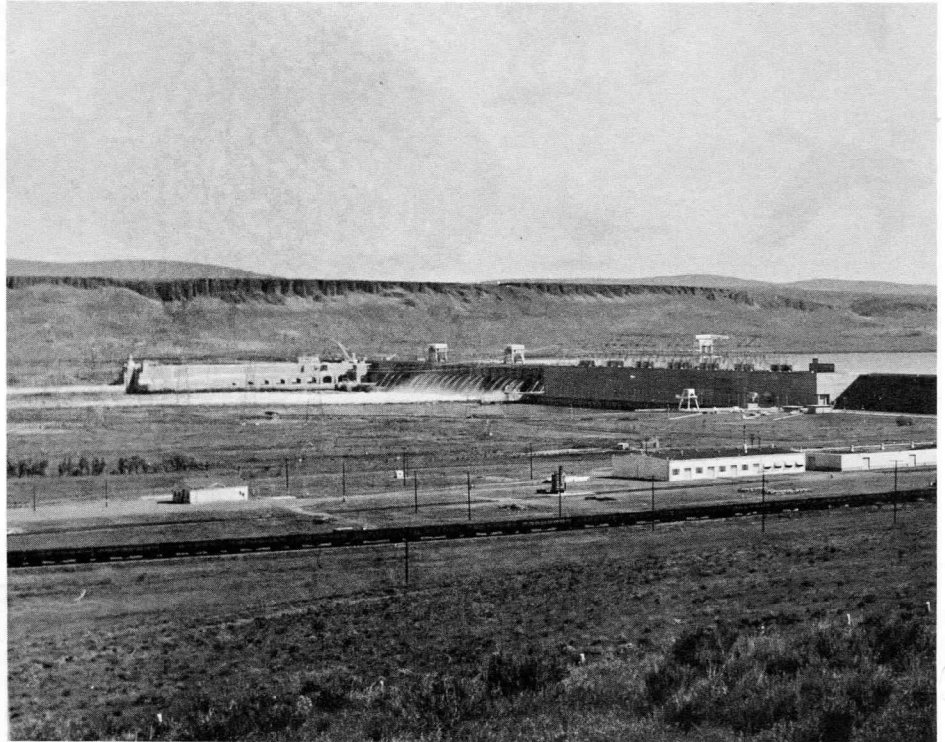
# Fish, Wildlife and Pollution

During heavy runoff periods, water plunges over the spillways of large dams with such force that air is trapped and forced into solution. The water becomes supersaturated with oxygen and nitrogen. On the Columbia River where the dams are stairstepped, each adds to the saturation since the slow flow of the reservoir below does not allow the excess gases to be expelled back into the atmosphere. Fish spending much time in this water absorb large amounts of these gases, especially nitrogen, and develop bubbles in the eyes, skin, and internal organs. Blindness, disease, and death may follow.

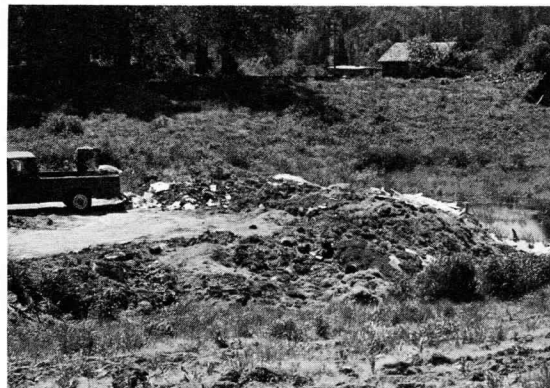
Fish face still another peril from the tons of rock, sand, and silt that wash into streams each year as a result of careless road building, logging, farming, and other land-use practices. Trout, salmon, and steelhead eggs incubating in the gravel beds of streams are smothered or the beds covered by the erosion products and made useless for spawning. Aquatic life in the stream, which makes up the food chain, is also endangered by siltation. Soil remaining suspended in the water restricts the penetration of light and reduces the growth and photosynthetic activity of oxygen-producing plants.

Lakes and streams strewn with litter also show the effect of mechanical pollution. Beverage cans and bottles act as efficient and deadly traps for small fish. Opener tabs cause injuries to fish thinking the flashy things are food.

Domestic sewage and slaughter house and food processing discharges add another form of pollution to our waters. Proteins, fats, and carbohydrates in biological pollutants produce a fertilizing effect in the receiving water and accelerate the bacterial growth rate. Dissolved oxygen necessary for fish and other aquatic life is rapidly consumed by multiplying bacteria as they break down the organic compounds.



A series of dams may cause river pollution by supersaturating the water with nitrogen. Also, the reservoirs created by the dams are subject to heating by the sun and the habitat is made less desirable for trout and salmon.



Litter and other trash may cause chemical pollution of water and some of the objects may act as traps for small fish.

Logging can create several types of pollution in streams. The actual debris blocks fish passage. Decaying material uses the available oxygen in the water and the removal of the shade along the stream can cause water temperatures to rise above those that can be tolerated by salmonids. Later erosion may silt in the gravel spawning areas needed by the fish.



In water with little oxygen, trout and salmon are unable to compete with carp and other hardy rough fish. Salmonids may survive low oxygen concentrations of one or two parts per million (ppm) but cannot maintain their population for long at such levels. Death or adverse effects on reproduction, growth, and activity result from oxygen depletion by biological pollutants.

Nitrogen and phosphorus in sewage and other organic wastes create conditions favorable for growing green plants. In sluggish streams, impoundments, and lakes fertilized by biological pollution, blooms of algae make the water pea-soup green, smelly, and unattractive. As the algae die and decompose they, too, rob the water of oxygen. Under certain conditions some algae develop poisons capable of killing wildlife, fish, and livestock.

Other plants also increase in fertilized waters. The expanding quantity of vegetation hastens the natural buildup of organic deposits and a water area physically fills itself in, becoming first a marsh and finally dry land. Fish living in the deeper, cooler lakes are replaced by those capable of surviving in the more shallow, warmer waters. Eventually all fish lose their home and are replaced by semiaquatic species and terrestrial life.

Pollution by chemicals such as sulfite wastes from pulp mills, detergents, acid mine wastes, and cyanides from processing metals also endangers aquatic life. These chemicals may be directly toxic and kill within a short time or sublethal and affect reproduction, growth, and other members of the food chain. Some forms of chemical pollution also act like the biological ones by reducing oxygen and increasing vegetation.

Fishing can be reduced or destroyed by toxic chemicals and still leave the water acceptable for other forms of recreation such as boating or swimming. High temperatures, turbidity, low oxygen levels, and changes in acidity or alkalinity make fish more vulnerable to chemical pollutants. Any one of these or a combination acting simultaneously may cause great damage to fish and other aquatic life.

Oil spills and discharges cause losses of wildlife each year. Valuable fish resources are affected by oil polluted waters. Birds in the area may be poisoned or drown when oil-soaked feathers make them unable to swim or fly and marine life such as clams and starfish smother when the sticky black masses blanket coastal and river bank areas.



# Fish, Wildlife and Pollution

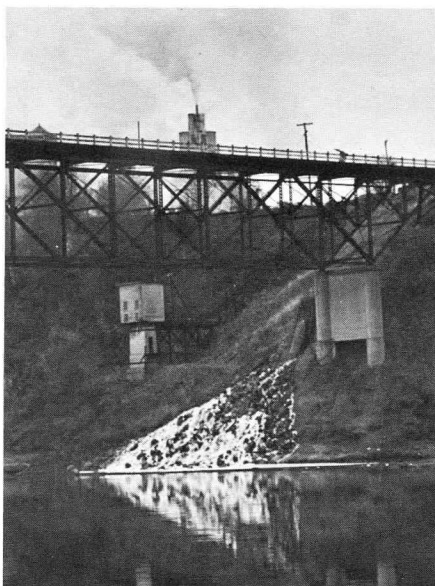
Another type of pollution not yet recognized by many people but rapidly increasing in importance is thermal. Heat is very beneficial to both aquatic and terrestrial life but in large amounts can assume the role of a pollutant. Heated effluents from industry and nuclear power plants cause thermal pollution in our streams. So does heat from the sun.

Temperatures of salmon and trout rearing streams rise sharply when protective shade is removed. Reservoirs also expose large areas of water to the sun's heat. Heartbeat, respiration, and other body functions of fish accelerate with rising temperatures. There is a point at which the delicate mechanisms regulating these functions become overworked and operate abnormally. General health and reproduction suffer from the internal disorders that follow and death often results. Diseases become more virulent in warm waters and fish lose resistance they had at cooler temperatures. Heat also increases the use of oxygen in bacterial decomposition and reduces the ability of water to store oxygen. High temperatures in a river can form a thermal barrier to both upstream and downstream migrations of fish.

## Air Pollution

Although less of a threat to wildlife than water pollution, contamination of the air by smoke, toxic gases, and noxious fumes poses a problem. Emissions from field burning, pulp and paper mills, metallurgical plants, and other manufacturing processes add thousands of tons of pollutants to the air each year. Other major contributors are motor vehicles, home furnaces, and trash burners.

Air pollution defoliates or reduces the vigor of plants in areas of concentration. This degrades the habitat for wildlife. Human health problems associated with air pollution also plague wildlife.



Direct chemical pollution of a stream caused by dumping of industrial wastes.



Sprayed pesticides not only may directly poison wildlife but also may kill its food supply. Birds depend largely on certain insects for their food. The same pesticides may affect fish later as rains wash the chemicals into streams and lakes.

## Pollution by Pesticides

Chemical poisons produced by man to free him from crop-damaging and disease-carrying pests are now found worldwide in every kind of aquatic life and almost every bird and animal. Eskimos in northern Alaska and penguins in Antarctica carry residues of these poisons.

Pesticides can be roughly divided into two groups: persistent ones such as DDT, dieldrin, endrin, and others which do not break down readily; and nonpersistent such as malathion or pyrethrin which decompose into harmless residues within a short time. Persistent pesticides generally need fewer applications but they remain toxic for longer periods of time. The nonpersistent varieties are often more toxic immediately after application but must be applied several times during a growing season. Beneficial birds and insects are killed as well as undesirable ones.

Once washed from the land into rivers, lakes, and oceans, persistent pesticides begin to exhibit one of their most deadly characteristics: biological magnification. This magnification in successive steps up the food chain in one case began with the spraying of DDT on marshes near a lake to reduce a mosquito problem. After rains and normal water movements, "safe" concentrations of pesticide around .000003 parts per million (ppm) were found in the lake water. Tiny plankton in the water absorbed amounts around .04 ppm in the body. Small plankton-eating fish then developed even higher levels. Quantities of these fish were eaten by larger ones which were in turn devoured by still larger. Top members of the food chain such as bald eagles or ospreys feeding on large fish developed concentrations of DDT in their fatty tissues around 25 ppm. This is a magnification of nearly 10 million times the level in the lake water.

Although adult birds and fish may appear unharmed by high concentrations, the effect on their reproduction can be disastrous. DDT upsets the body hormone balance in birds and inhibits utilization of calcium in making egg shells. The resulting thin, flaky shells are easily broken in normal nesting. Young fish or birds may also die before or just after hatching from poisons passed on in the eggs.

Mammals are generally more resistant to pesticides than fish or birds and have shown relatively few effects from the poisons most carry in their bodies. The full impact of pesticides (continued next page)



Game Commission research personnel setting a fry trap. This device is used to capture small salmon and steelhead emerging from the gravel just after being hatched. This is one part of a study being made to determine the effect of logging on the aquatic resource.

## Pollution

(continued)

on future generations of all forms of life, including man, may not be known for some time.

### The Future

Efforts to reduce pollution have increased tremendously in the past few years. Research has developed new products and ways to reclaim valuable chemicals from materials previously dumped as waste. Better treatment facilities for industrial and domestic wastes have been built. Filtering devices and phasing out of much open burning have reduced air pollution problems. Finally, enactment of stronger legislation to control pollution and restrict use of certain pesticides offers hope for the survival of fish and wildlife for future generations to enjoy.

In spite of this progress, much remains to be done. Only heightened interest and public action can meet the future challenges of an expanding population and technology. It will not be cheap or easy.

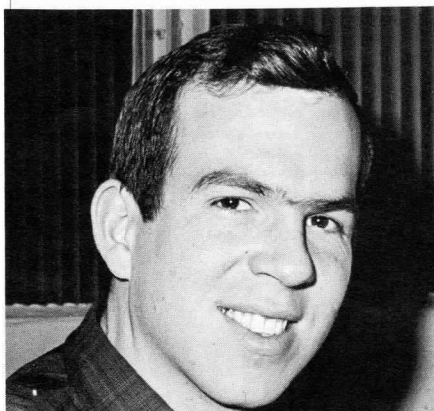
Eliminating pollution is not the responsibility of any one organization or agency. Everyone has a stake in a clean environment — government, industry, agriculture, and individual citizens in all walks of life. Wildlife is depending on you.

**GAME BULLETIN**

## About the Author

Cliff Hamilton is the newest member of the Information-Education staff. Last year when Ron Rohweder moved to a biological field position, Cliff was fresh out of Michigan State University with a Master's degree in conservation education and took over the conservation education chores at the Game Commission.

Though born in Walla Walla, Cliff spent most of his life in Ontario, Oregon and received a B.S. degree in fish and wildlife management from Oregon State University. He worked three summers in the Commission's youth summer camp program and one summer answering information telephone calls in the Portland office prior to going on full time in 1969.



## Anglers Asked To Return Cards

Salmon and steelhead anglers are reminded to return their 1969 salmon-steelhead licenses, commonly called the salmon-steelhead card, to the Game Commission at their earliest convenience. Collection boxes have been placed at all license agencies or the cards may be returned directly to the Commission, 1634 S.W. Alder in Portland.

Anglers are urged to return the cards now while the thought is fresh in their minds or before the cards become lost or misplaced. Fishermen will make a substantial contribution toward the management of these valuable fishery resources, since catch information recorded is used to compute the total statewide sport catch as well as catch by individual stream.

Sport fishermen should check the cards to make sure they have recorded correct information. Anglers sometimes fill in the wrong column by placing steelhead caught in the column for salmon or vice versa. Anglers are also urged to record the name of the port from which they embarked if their salmon fishing took place in the coastal bays and offshore waters.

Full instructions for recording the salmon and steelhead catch are found on the back side of the salmon-steelhead license.

## SEED DONATED

The Northwest Bowhunters Club, active conservation organization in northwest Oregon, recently donated about 70 pounds of bitterbrush seed to the Game Commission which will be used in the department's big game range rehabilitation program.

The seed — already cleaned, treated, and ready for use — was given to the Commission because club members thought that biologists trained in habitat improvement work would select proper sites on which the valuable seed would grow and the plants flourish. In contrast, haphazard planting as time permitted might result in great waste of the seed as well as the probability of being planted in areas unsuited for bitterbrush growth.

John McKean, state game director, said that the Commission is currently paying \$2 a pound for treated bitterbrush seed, so the club's gift has a cash value of \$140. He said the seed would be put to good use on several big game range rehabilitation projects already underway.

# In Case of Pollution Call...

Often citizens discovering cases of pollution would like to report to someone but are in a quandary as to whom it should be.

There are four state agencies concerned with pollution relating to the fish and wildlife in the state.

Prime agency responsible for pollution regulation, control, abatement, and enforcement is the Oregon Department of Environmental Quality with headquarters in the State Office Building, Portland. They will investigate cases of pollution of any nature including those that affect fish and game.

Pollution cases of any kind may also be reported to the Oregon State Police. They investigate apparent violations of the laws and enforce the pollution

laws and regulations. Any officer may be notified.

If the pollution involves game fish, birds, or animals, the Game Commission has an investigative and enforcement responsibility and any field worker or the Portland or regional offices may be contacted.

Finally, if the food fish resource of the state is jeopardized by water pollution, the Oregon Fish Commission may investigate the case. They are also headquartered in the State Office Building in Portland.

Actually, any case of suspected pollution may be reported to any of these agencies and the word will be channeled to the proper persons.

One thing of utmost importance, regardless of the agency you decide to

notify, is to act quickly. Often cases of water pollution are reported too late for an officer to get to the scene and actually ascertain what was occurring. Before any legal action can be taken, evidence must be obtained. This is often difficult under ideal conditions, but if too much time elapses it may be virtually impossible.

If possible, the best immediate action for a person observing pollution is to collect a gallon of the polluted water in a clean container. This is a tremendous assist to the authorities since intermittent or short-lived pollution may cease before an investigator can arrive at the location.

Reporting is essential. State personnel can only cover a limited amount of territory. Every citizen can help be the eyes of the investigators.



"... unchecked pollution will lead to disaster for Oregon's fish and wildlife resources." Indeed such pollution may not only threaten man's recreation, but may threaten man's own existence.

## Public Hearings to be Held

The Game Commission will meet on May 23 to set the tentative big game regulations and finalize the season lengths, bag limits, and other details on June 6. Both meetings will start with a public hearing at 10 a.m. at Commission headquarters at SW 17th and Alder in Portland.

Details of the upland bird season will be considered at a meeting in August.

Regular business meetings of the Commission will be held on February 13 and March 13.

## Editor's Note

The subject covered in our feature article is so complex that it would take many books to go into any detail. It is hoped that by using this issue to present the highlights of the subject we may be able to give the student and interested reader some feeling for the complexity of the subject. In our limited space it is obvious that only generalities can be mentioned. Further inquiry can very well lead the interested reader deeply into the whole field of ecology, a fascinating but endless field.



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