

MONTANA *Wildlife*

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MONTANA FISH AND GAME DEPARTMENT

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What Price for "Progress"

By Vern Campbell, Fish Hatchery Foreman

With just a little imagination one can almost hear the cries of Indians and pounding hooves of buffalo as he gazes out over the green prairie north of Browning. Here is a land—unplowed and almost free of fences. It must have looked much like this before utilitarian white man traveled west.

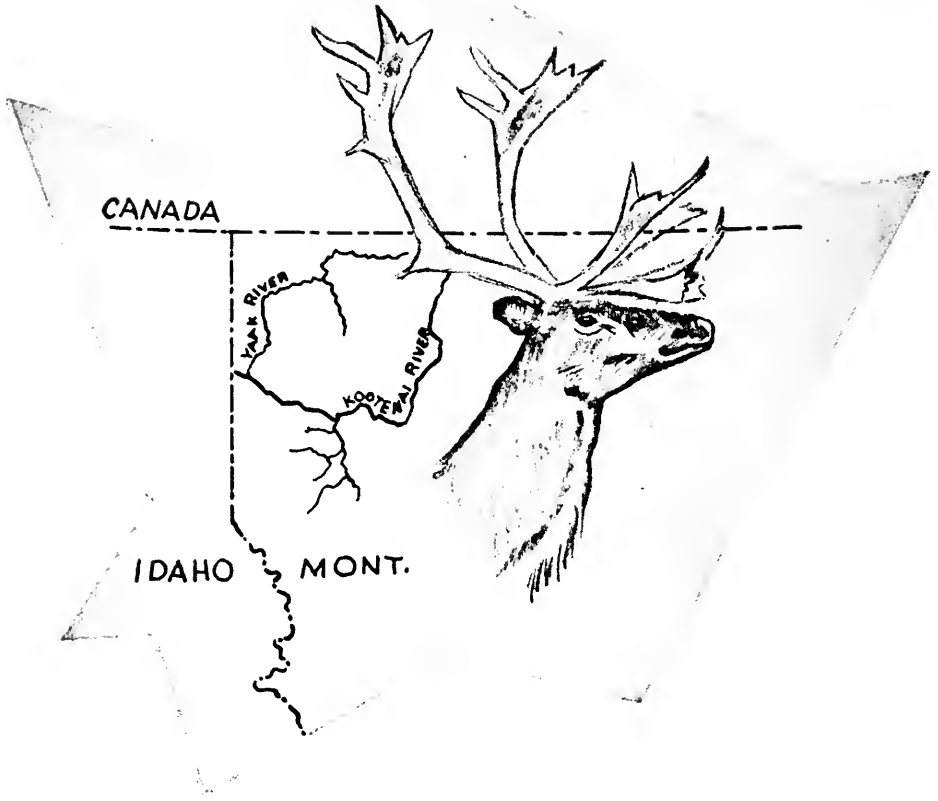
So very few material things remain unchanged. Most unchanged things are so only because they have been cared for in museums or by antique collectors. Though fortunes are tied up in such collections their true worth lies beyond a dollar value.

We Montanans are fortunate in still having streams as well as lands that are almost living museums in that they still contain only native fishes and are changed little physically. In these streams are found cutthroat, whitefish, suckers, and in some, grayling. This combination existed here with the Indians. It is a carefully worked out continuation of nature. We would like to preserve these few streams as they are instead of converting them to rainbow or brown trout waters. There are some important reasons for wanting it this way.

First, 47 other states have catchable rainbow trout, while only a few western states have a smattering of native black-spotted cutthroat. This will become an increasingly important attraction. Secondly, these native fish are accustomed to living in colder, less fertile waters where most other game fishes do poorly.

The next reason is more far reaching and perhaps more important in the long run. That is the perpetuation of nearly virgin segments of nature for study. The lessons taught man and the benefits gained from learning nature's secrets are almost beyond number. We are certain to gain more with further studies.

These things, if lost, very probably can never be restored. With your help they may be held the way they are.



CARIBOU ON THE YAAK

Over the high Rockies, small bands of Caribou trickle into Montana, pause for a while, and then vanish into the alpine forests of Idaho or Canada. Very little is known about these migrants, either in Montana, in Idaho or in Canada. Their numbers, the extent of their range, the exact nature of their movements, even their true identity is not definite.

Caribou are unique among the deer family in that females as well as males normally have antlers. Like other deer, they shed their antlers each year. The hooves of caribou are

somewhat like those of moose. They are large and spread widely, affording good buoyancy over crusted snow and soft or marshy ground. The dew claws are very prominent and leave a telltale mark of identification. All caribou are primarily brown in color. The brown may range from very light to the very dark, characteristic of the type seen in our state.

The periodic invasion of northern Montana, Washington and Idaho is often rather surprising since we generally visualize this animal as an in-

habitant of the far north; however, they were at one time common-place residents of many northern states. Many attribute their disappearance to destruction of the forests and food sources, while others contend that uncontrolled hunting eliminated them from much of their original range. Probably many factors played a part in the caribou's virtual disappearance from the United States.

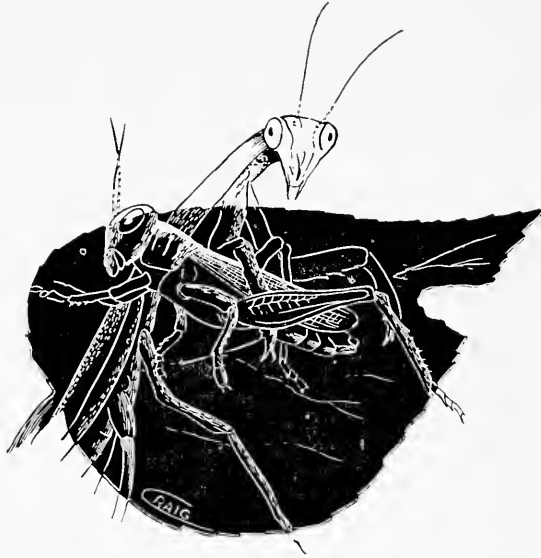
The only portion of Montana frequented by caribou is the north-western portion, primarily the Yaak River drainage. Several have been seen there. Tracks and discarded antlers have proven the presence of others.

The mountains frequented by these caribou provide heavy forest areas apparently necessary for their welfare. Here they can find mosses, lichens, and browse for food. Some authorities state that caribou often eat considerable quantities of grass, however, lichens are a preferred food.

John Morrison writes that: "Undoubtedly, the main limiting factor

on this caribou population is the extent of a suitable habitat. Extensive reductions in other herds of mountain caribou have resulted from large fires which destroyed extensive areas of the climax-type habitat required by them (Edwards). These fires removed the caribou's food supply and in its place grew sub-climax vegetation which was more suited for deer and moose. Mule deer and moose increased greatly in numbers and extended their range into former caribou habitat. Declines have taken place in predator-free areas, so it is believed that wolves or cougars are not to blame. Some people in Canada have blamed moose for crowding out the caribou. The dietary differences and habitat requirements necessary for either species rule out this effect. The animals simply cannot subsist in the same habitat types."

Caribou will probably remain as a novelty in Montana so long as dense forests remain in their life zones. It is not probable that they will ever become numerous enough to afford hunting.



ARE INSECT POPULATIONS CONTROLLED BY THEIR NATURAL ENEMIES?

By Doctor J. H. Pepper, Montana State Entomologist

Everyone is familiar with the fact that insect numbers often fluctuate within wide limits from one area to another as well as within the same area from one year to the next. For example, one year grasshoppers may be abnormally abundant, the next year it may be cutworms or aphids and the following year crickets or some other insect. Perhaps the most exasperating feature of these upsurges in insect numbers is our inability to predict them in advance or for that matter even to determine what caused them once they have occurred. The same can be said regarding the reasons why these high populations fall off, sometimes very

rapidly, until their numbers are so few that they are not even noticeable.

Since so many of our insect species are of economic importance, either beneficial or harmful, it is understandable why so many people are interested in knowing something about the causes responsible for fluctuations in their numbers. Unfortunately this problem has proven to be one of the most difficult ones with which the biologist has to contend. This is not only the case with insects; it is equally true for all classes of animals.

Practically all of the earlier studies on the problem of natural control of insects were confined to observations

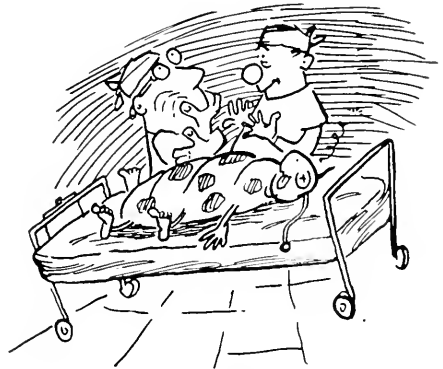
on those factors which were known to destroy the insect in some stage of its life cycle, that is the egg, nymphal or adult stage. These mortality factors included such things as lack of food, adverse weather conditions, disease, parasites, predators, etc. Among the predators it was noted that large number of insects were consumed not only by other insects but also by such things as birds, bats and lizards as well as many other insect eating animals. All of these observations tended to confirm the then prevalent idea that all insects tended to over-reproduce themselves and that their numbers were kept in check by some combination of those factors which were known to destroy them. From here it was easy to reason that if one or more of the controlling factors get out of balance an upsurge in the particular insect population would result.

It is easy to see why such a theory soon gained general acceptance not only by many biologists but also by the public in general; it made sense. Practically everyone could recall some specific instance where a period of cold weather, an outbreak of disease, large numbers of parasites or a large influx of predators, especially birds, was responsible for terminating an insect outbreak. All that remained to be done was to measure the precise role each of them played in bringing the outbreak under control.

As more and more data became available on this subject it became increasingly evident that the facts did

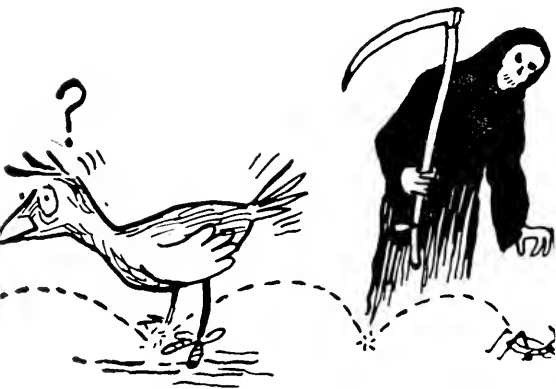
not fit the theory. For example, in one place within an outbreak area, a rapid decline in insect numbers would coincide with the presence of large numbers of parasites; in another place it might be adverse weather conditions; in another place it might be large numbers of predators of various kinds. The disturbing feature, though, is that in the majority of places within the outbreak area no observable or measurable mortality factors could be found to account for the rapid decline in insect numbers. One can only conclude then that the basic reason for the decline involved something other than those mortality factors which operated only within a small percentage of the total outbreak area.

If we are to assign a specific role in the control of insects, to say the parasite or predator, we must of necessity assume that all insects which escaped their activities would automatically survive. This is an unwarranted assumption inasmuch as the large percentage of the insects



Cause of death unknown.

which escape their attack die anyway and from no apparent cause. Regardless of how we try to relate the effects of the numerous mortality factors to natural control we always arrive at the same impasse—that is, how can we assume that natural enemies are primary factors of control when a large majority of insects in the outbreak area die off from some other cause. And further how can we assume that those insects which were destroyed by parasites, predators, disease, etc., would have survived had they been successful in escaping from their natural enemies? There is no direct answer to these questions but the evidence strongly suggests that at least the majority of them would have suffered the same fate as did those which escaped attack.



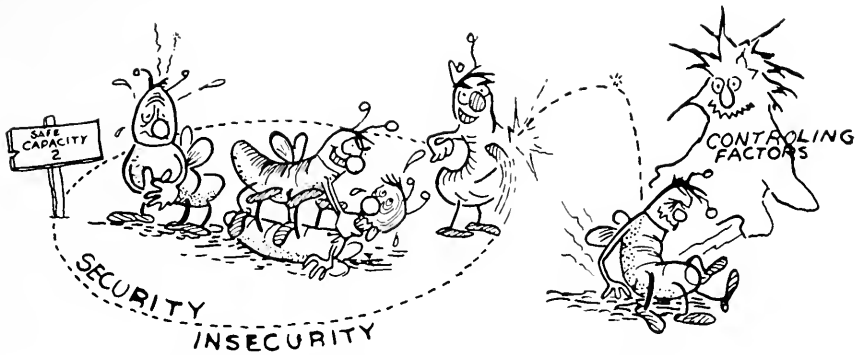
How can we assume that insects which escape natural enemies will automatically survive.

What then, it might be asked, is basically responsible for controlling any animal population? If there was no such a thing as natural control of animal numbers in the case of insects at least, the entire world would soon

be overrun to the exclusion of all other animal life. We know that this does not happen. All of these considerations have prompted a few research workers to explore new possibilities in an effort to explain just how natural control is accomplished.

Our knowledge on this subject is very meager so at this time we must of necessity call on a limited number of studies made on animals other than insects and apply the principles derived from these studies to insect populations. The process is obviously a very complicated one — many phases of which are not understood as yet.

In general the evidence seems to indicate that natural control is accomplished through what is commonly referred to as an "internal self-compensating mechanism" which goes into operation as soon as the population density exceeds that which the area can maintain in a secure state. The thing which sets off the entire chain of reactions which ultimately results in control is the property of intolerance which as far as we know is universal among all animals. While a certain measure of intolerance seems to be associated with all animals at some stage in their life history the thing that intensifies it appears to be the occurrence of a crowded condition, whereby the population density exceeds a certain value. This density value is variable and as far as we can tell, it is determined by the nature of the habitat or the places in which the animal normally lives. One pronounced



Intolerance intensifies under overcrowded conditions.

effect of intolerance is strife among the individuals which results in the excess population above that which the area can maintain being driven out into the surrounding territory where they are vulnerable to attack by natural mortality factors. There is also considerable evidence to show that the rate of reproduction in animals is drastically reduced where excessive strife exists.

The basis of natural control then lies, not in the effects produced by those things which are known to destroy the insects, but rather in their becoming more susceptible to the various forces which are capable of destroying them. When the habitat is overpopulated the surplus individuals become susceptible to the various forces which are capable of destroying them. When it is underpopulated most of the individuals are relatively secure and as such not vulnerable to attack by their enemies. The important thing is that the surplus individuals may be disposed of by an one of several forces; whichever one happens to be operating

at the particular place at the particular time. At one place within the outbreak area it might be parasites, in another disease, while in still another place it might be predators while at the same time adverse weather may be taking the greatest toll over the entire area. Many of the individuals may be in such a weakened state that they just die off from no apparent cause. All of these things coupled with a low rate of reproduction would soon bring the outbreak under control.

Even to determine the precise role played by any one of the natural enemies in disposing of a surplus population is next to impossible. For instance, if some of the surplus insects are not eliminated by a disease they might be destroyed by a parasite or predator. If they were successful in escaping all of these natural enemies they would probably die anyway from one cause or another before they reach maturity. How, then, can we say that any one or any combination for that matter of natural enemies played a part in bringing

the outbreak under control. It appears much more reasonable to assume that they merely helped to speed up the rate at which the surplus insects were disposed of which is an entirely different thing from saying that they aided in bringing the outbreak under control. This does not say, however, that there may not be occasions when a heavy concentration of predators such as birds could be responsible for cleaning up most of the insects in some localized spot. What the overall effect of such limited activities in bringing the outbreak under control, though, is another matter.

Many species of birds are rated rather high as insect predators and the statement is sometimes made that they are quite effective in keeping insect numbers down. These statements are based on observations on the food habits of the various bird species and, with few exceptions, do not represent any measurement of the direct effect the feeding had on the insect population in question. Where effects have been noted the assumption must still be made that had the birds not eaten the insects they would all have survived. In light of the previous statements made in this paper such an assumption is questionable. When one stops to consider the astronomical number of insects that populate most areas even when they are in non-outbreak numbers it becomes rather obvious that enormous quantities of insects would have to be consumed even to make a

dent in the population. There is no data to support the belief that even a relatively heavy concentration of insect feeding birds could accomplish this feat except under very localized conditions.

Most of our Montana birds are protected by law throughout the greater part of the year. All migratory birds with the exception of certain species of waterfowl are protected at all times. Since waterfowl are not insect eaters they can be automatically eliminated from further consideration. Song birds make up the largest group of our insect feeding birds and since they are protected by law we have no control over their numbers. This leaves only our upland game birds to consider from the standpoint of management to control their numbers. These are all resident birds so they must of necessity feed on material other than insects for approximately eight months out of the year. While some of our game birds do feed on insects when such are readily available their main source of food consists of seeds, buds and plant material in general.

Actually if any relationship does exist between upland game birds and insect control it would be influenced by the matter of timing in population fluctuations of both groups. Insect populations usually are at their peak during the spring and early summer after which their numbers fall off rapidly. Likewise peaks in upland game bird populations occur during approximately the

same period. As has been stated, most upland game birds consume some insects.

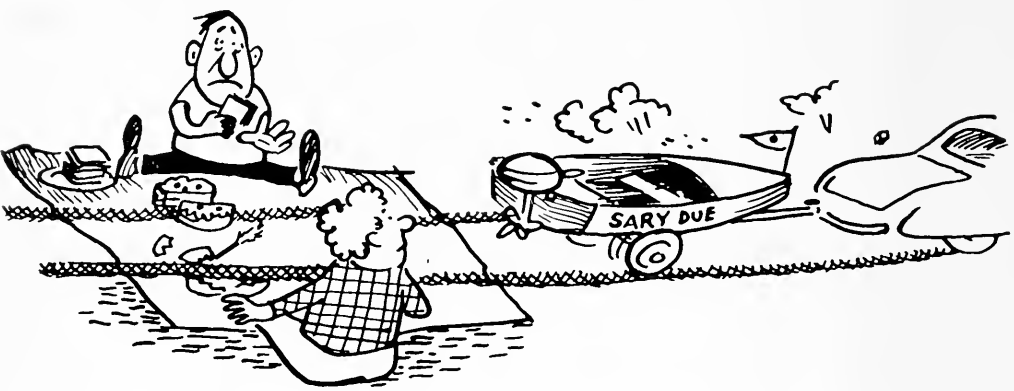
In the case of the pheasant, studies have shown that the food of young birds, up to six weeks of age, may consist of as high as 28 percent animal matter. Because of this some people have advocated that these birds should not be molested or harvested in order to provide a continuing high population of birds for the purpose of controlling the insects. One point they have overlooked though is that the same compensating factors previously mentioned as controlling insect populations also react to reduce pheasant and other upland bird populations. Many studies on upland game birds have indicated that about 70 percent of their populations are lost from one year to the next through natural causes. The number of pheasants for instance that are carried through from one season to the next is determined largely by the ability of the winter habitat to protect and maintain them. Since studies have shown that approximately two-thirds of them are

eliminated from one cause or another, protecting them from the hunter during the fall season is not going to have any particular effect on the bird population the following spring. Besides, regardless of how many birds are or are not harvested in the fall, they never become abundant enough to be even considered from the standpoint of insect control.

Since through our activities we are continually changing many features of the environment in which our game birds live, they are constantly having to cope with these changes if they are to survive. If they cannot adapt themselves to the changed environment they must either move to more favorable areas or be eliminated. This same situation holds true for each species of insect. It would be pure coincidence then if game birds happened to be abundant in an area where some species of destructive insect was building up to outbreak numbers. The whole problem of distribution and abundance of all animal life is so complicated that we should view with suspicion any simple explanation that is offered to describe their natural control.

Formulas for Disaster

Here are some formulas that should interest all boat enthusiasts. Many follow them to the letter, others never get a chance to use more than 1.



- 3. B = boat P = people.
C = capacity of boat.
- $\frac{B \cdot P^n}{C}$ = a capsized boat and often drownings.

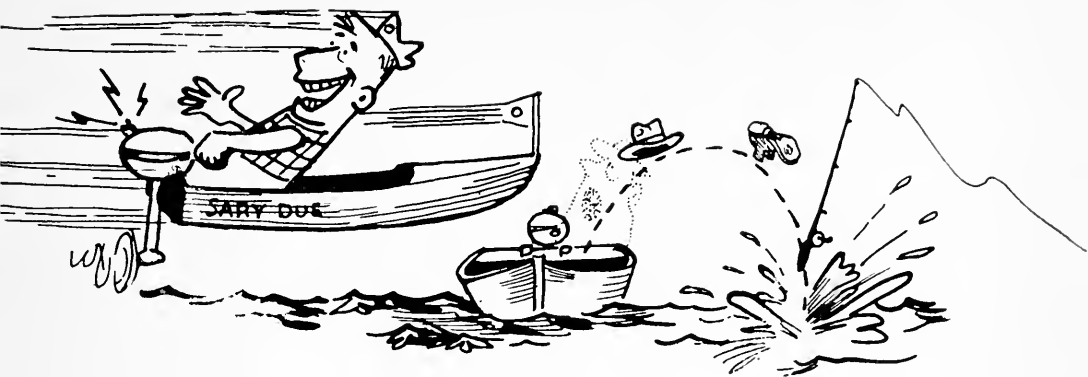
- 1. B = boat P = picnickers H = hurry.

$\frac{B + H}{P}$ = poor relations between boat owners and other recreationists.



- 2. G = gasoline C = cigarette.

$G + C$ = Boom! This is one of the most easily followed and yet most effective formulas we have found.



4. B = boat S = common sense.

B - S = disaster for both the man who does not use judgment and for his hapless victim.



5. B = boat V = vision S = swimmer.

B - V = at the very least a sound
 S cursing for the day-dreaming boat owner.

Any of these formulas can get you in the papers. Don't take our word for it, just check over a few current issues. A good place to look is in the obituary column



2 + 2 = 4

Some time ago an oddity stated that if the newspapers published during one year were placed end to end, they could reach to the moon, go around it, and back to earth. Now this may not be a very useful piece of information, but it does illustrate a point very nicely—small things put together can add up to one whale of a big thing.

Little by little each year, chunks of good trout waters are being straightened, cleaned, and shallowed. Like the newspapers, they are adding up to a pretty big thing. In fact, the loss of fish homes (habitat) is now the most important single factor contributing to a trout fishing decline in Montana.

Any kid who has ever pulled fish from a stream knows that these fish hang out in the brushy holes, rocky eddies, and beneath undercut banks. He soon learns to shy away from straight, clean, shallow stretches of water. They don't produce.

Let's take a look at Flint Creek as an example of habitat destruction through stream straightening. Here the fish population had been determined (through fish shocking) each spring since 1954. The creek averages about twenty feet wide and six inches deep in riffle areas. Willows and undercut banks provide a good trout cover.

During the fall of 1956, new highway construction was begun near the junction of U. S. Highway 10-A

and Montana No. 38. In constructing, 350 feet of Flint Creek were channelled out.

A comparison of fish in the channelled areas of Flint Creek before and after provides some pretty conclusive figures. In a 300 foot area where 69 catchable trout were counted in 1956, only 6 catchable fish were found after it had been "improved" by a bulldozer. This was a 94 percent reduction in both numbers and weight of catchable game fish. There was also a heavy, though probable temporary, loss of fish downstream from the construction site.

Flint Creek has only been used as an example. Such stream channeling is common along highways of mountainous Montana.

The Fish and Game Department has been busy with the Bureau of Public Roads, the State Highway Department, and the Forest Service trying to hold down the damage to streams by road buildings. These agencies are not out to ruin fishing and are cooperating to the extent they can. But roads are expensive, and while laws require mitigation of damage to private property, there is no provision to require or even allow agencies to build a bridge if the job can be done cheaper by straightening a stream. Nor is there allowance to make restitution for damage to an

important trout stream. Nothing prevents a stream bed being dug up for gravel—this very thing was done in the Ruby River last year.

Legislation to cover such losses have been provided in other states

and is badly needed here. Such legislation would result in a greater cost for roads along trout streams, but over the years the cost would be repaid manifold by the preservation of one of Montana's priceless resources.



This is a section of Flint Creek before highway construction. Note the excellent cover of foliage.

—Photo by Jack Bailey



A section of Flint Creek after adjacent highway construction.

—Photo by Jack Bailey

YOU AND SURVEYS

By Clint Bishop

With all the so-called trash mail we get nowdcys, many things that even hint of salesmanship or form-type mail finds its way into the garbage can before it is read. We hope this isn't happening to our survey mail because you, as a sportsman, have a stake in them. They are helping to decide management policies and regulations that will affect you.

Two important mail surveys aimed toward gathering information for the Montana fisheries program are now underway. The most current is a questionnaire designed to give an overall picture of fishing pressure and success for all Montana. The questionnaires will also help to give important information as to which waters are receiving the most pressure.

For 18 consecutive weeks 1,000 of these inquiries will be mailed. The 18,000 persons receiving them represent a 10% sample drawn from the list of 1957 fishing license holders. You may be among them.

The second survey has been in action since 1947. The "Fisherman's Logs," as they are called, are distinct from the ordinary inquiry form in that they are attractive and handy-sized booklets which are retained by fishermen as permanent and prized records of their sport. They are mailed only to persons requesting them.

The records contain names and locations of lakes or streams fished, numbers and average lengths of fish caught, hours fished, kinds of fish caught, and of course, dates. If you would like one of these handy booklets they are yours for the asking. Send your request to Clint Bishop, Montana Fish and Game Department, Helena, Montana.

At the end of each fishing season, the booklets are mailed to the Fish and Game Department. Here the information is transcribed

and summarized by electronic business machines. The logs are then returned to their owners.

Information contained in the resulting reports helps determine distribution of various fishes in Montana, aids in setting up hatchery distribution programs, and acts as a guide in evaluating fish planting. They also provide one source of information used by the Montana Pollution Council in water classification.

Many other uses have resulted from this information provided by interested sportsmen. If you would like to take part in Montana's game and fish management, we encourage your support of department surveys.

Fisherman's Log



This is a reduced replica of the Fisherman's Log cover.

Camping Tips

It's nice to boast of "roughing it" in the woods, and there are probably some exceptionally rugged individuals who actually enjoy camping the hard way. But most modern Daniel Boones prefer a camp with convenient equipment so they may remain warm, dry, and can prepare meals with comparative ease. Let's face it—we are a soft lot.

If you are a novice who anticipates a camping trip in Montana, here are a few pointers that may help make the outing more comfortable and enjoyable.

Clothing: Weather in Montana can turn cool at any time of year. In the higher elevations, nights are generally chilly the year around, so take along some extras for the "unusual" weather.

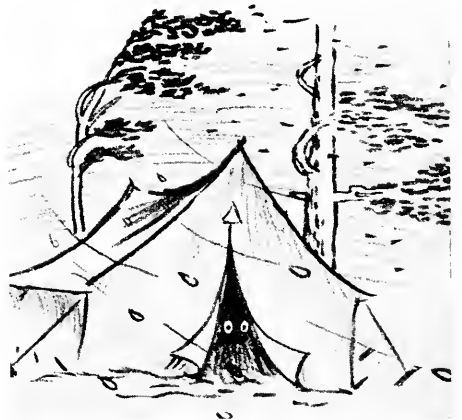
1. Camp clothing should fit loosely for maximum warmth.
2. Plastics and water treated garments often become moist on the inside and unusually warm during hot days.
3. After the first of September, cold weather should be anticipated in the high country—caps with ear muffs, heavy socks and mittens may be in order. Always take along an extra change of clothing in case you become wet.
4. Packs large enough to afford room for heavy sox and having cleated soles are good footwear for the mountains.



Don't make camp below debris that may fall.

Shelter: If you have a trailer house or cabin, you are all set up. However, if you are using a tent, do your best to set up before dark.

1. Locate camp on a high spot where water will drain away from the tent.
2. Before setting up, make certain you are not beneath dead snags, boughs, or other materials that could possibly fall.



If possible, face tents away from storm areas.

3. Clean all rocks, sticks and other debris from the tent site.

4. If you can determine direction of possible storms, keep the back of the tent to the storm area.

5. Dig a shallow trench around the tent to carry rain away from the camp site.

Furnishings:

Bedding—Nights can be long and miserable in a cold bed. The important thing is to get off the ground and have plenty of bedding both beneath and over you. If you are using blankets, two light ones provide much more warmth than one heavy. Sleeping bags, of course, are preferable for maximum comfort.

Canvas cots with roll-up mattresses are compact and comfortable. Air mattresses are also light weight and



You will enjoy the trip more if you have a warm comfortable bed.

very comfortable. In a pinch, pine or spruce boughs (eliminate all large stems) piled between log retainers will make an adequate mattress. Cover them with a tarpaulin before making your bed.

Nesting type aluminum kettles are hard to beat for cooking utensils. Cups and dishes of durable plastic are a welcome innovation.

Make yourself a check list of camp articles and be sure it's filled before you leave home. Be certain to include a lantern, axe, extra rope, waterproof matches and, if possible, an extra tarpaulin.

Food:

Foods are, of course, a matter of personal preference. Dehydrated and prepared foods are both highly concentrated and easy to prepare. While in camp, food should be wrapped and hung by wire over a tree branch. This will keep destructive animals from ruining it, or ruining your tent while searching out food odors.

All stream and lake water should be boiled at least one half hour before drinking. Pour from one container into another until it is aerated. This will eliminate the flat taste of boiled water.

Fire:

Fire in the woods is a danger nearly all times of the year! Take every precaution to insure your camp fire will not spread. Never build a fire next to stumps, trees, or under boughs.

1. Clear all inflammable material from the fire area.

2. Surround the fire area with flat stones. They will confine the fire in a small spot, hold the heat, and provide places to set cooking utensils.

3. Start your fire with small materials such as grass or small twigs and then add successively larger fuel. There must be a space beneath the fire for draft, otherwise it will be difficult to start and will burn poorly.

In damp weather, fires may be started with pitchy materials. Keep wet wood near the fire where it will dry and be ready for use.

4. Before leaving your fire, drench it thoroughly and mix in well with dirt. Make certain the last spark is out.

Cooking over embers is far better than over open flame. The heat is more even and utensils are not blackened with soot.



The danger of uncontrolled fire is always a camp-mate.



A CODE OF LAW ENFORCEMENT

By Robert W. Burwell, Regional Director, U. S. Fish & Wildlife Service

Reprinted from the Conservation Volunteer—A Minnesota
Department of Conservation Official Bulletin

The following article contains a major portion of a speech presented by Mr. Burwell at the 1958 Minnesota Warden School.

Don Brown, Chief Law Enforcement Officer for the Montana Fish and Game Department, felt that the article so well expressed what should be expected of law enforcement officers in any state that he requested it be reprinted in Montana Wildlife.

Last month, Director Hoover of the Federal Bureau of Investigation wrote a memorandum to all law enforcement officials in which he set forth what in his considered opinion were the ten cardinal principles which should guide Law Enforcement Officers in the conduct of their work. With your permission I would like to review those ten principles set forth by Mr. Hoover.

1. **Let** common sense guide your judgment and courtesy control your actions at all times.
2. **Be** ready to serve the public interest, staunchly and fearlessly twenty-four hours each day.
3. **Strive** diligently to free the innocent as well as to convict the guilty. Justice, not punishment, is the goal of law enforcement.
4. **Avoid** temptation to seek personal advantage from the knowledge and stature gained through your position.
5. **Honor**, don't abuse, your badge—the rights of individuals are most precious possessions.
6. **Uphold** the reputation of your organization — public esteem earned over the years by dedicated law enforcement work can be shattered by one act of misconduct.
7. **Beware** of favoritism — wealth, race, creed and influence have no place on the scales of justice.
8. **Learn** more—serve better—earn more. Grow with our profession by acquiring new skills and techniques in the modern law enforcement field.

9. **Act** always as a model to youth—a source of friendship and a modern example of old-fashioned integrity.
10. **Properly** prepare in body, mind and conscience to discharge your responsibilities—and then do your best in the service of community, country and God.

In addition to these ten principles, Director Hoover made this statement:

“There is no stronger magnet for public trust in law enforcement than the respect and confidence inspired by an outstanding officer. He must be a crusader against corruption, a defender of the distressed, and a symbol of the American democratic way of life. Nothing less than a full measure of integrity, perseverance and effort by every representative of law enforcement can be our goal.”

We could take any one of the ten principles established by Mr. Hoover and discuss it during the next few minutes, and I am sure that would not be a waste of time. But instead, I am going to talk about one of the arts that isn't even mentioned in the ten principles—but actually is implied in all of them.

At some risk of being labeled a “Fancy Dan” or an exponent of the “kid-glove method” of law enforcement, I am going to talk about the art of being gracious. I hope to explain how, by cultivating an ability to be gracious, we can better apply ourselves in carrying out the principles suggested by Mr. Hoover.

At the outset let me make it clear that I am not advocating that Game Law Enforcement Officers become popularity boys. I am not suggesting that we become the amiable, jovial, easy-going type of individual who uses flattery or other means to make himself a popular figure. What you and I are concerned with is respect for the Law Enforcement Officer. True, we hope to be liked by our fellowmen, but far more important, we want and need their respect, and one means of becoming respected is to practice being gracious.

First of all a gracious man is a man who is considerate of others. This consideration begins with the man's family and extends to the community in which he lives and to the people who make up the organization in which he serves. The considerate man enters into the life of his family, his community, and his organization with good cheer, making little of his troubles and much of his good fortune. The considerate man is the man who applies the Golden Rule every day, all day, to all people.

Sometimes these marks of consideration are so small and so obscure that they are hardly noticeable. When a man establishes a reputation for himself as a considerate man and the marks of his consideration are so obscure that they are hardly noticeable—in other words, you have become a considerate man by force of habit and people come to expect consideration from you auto-

matically—then you have gone far up the road towards becoming a gracious individual.

Now what are some of these small ways, obscure ways, of showing our consideration for others. One of these marks is how well we listen. In our line of work we become in the eyes of the public, and sometimes in our own opinion, authorities on game law enforcement. When a person becomes an authority, it sometimes becomes hard to listen to the viewpoint of other people when they talk on the subject that we so well know.

But a gracious man is a good listener, and after he has listened well, he discusses issues; he does not dispute them. He shows his consideration for others by absorbing and acknowledging whatever truth he can find in opinions which are different from his.

A considerate man takes an interest in other people and in what they are doing. To the extent that he can, he helps them reach their personal goals and ambitions. He rejoices in their good fortune. He makes an honest and sincere effort to help when they are in trouble.

Now what does this mean to a Game Law Enforcement Officer? Just this. If you take an active part, for example, in the church activities in your community, you are demonstrating an interest in your neighbors or fellow communicants. By showing your interest in them and a desire to reach a common objective, you are demonstrating, too that you have something in common with them.

Similarly, if you join your local civic club—Rotary, Kiwanis, Lions—you are demonstrating to local businessmen that you are interested in their problems, in community betterment, in a better life for the area that the civic club serves. In that club, you are the representative of the profession of law enforcement, but you are also showing to the druggist, to the newspaper editor, to the filling station operator, to the bank president, to the local realtor, and the local insurance agent, that you are interested in them and their problems.

Actions that mark you as a considerate man can be shown in carrying out your enforcement job. It can manifest itself when you make an arrest. I have no sympathy for the habitual game law violator, but if you treat him considerately, if you treat him in a courteous, fair, and friendly manner, it may be that you have helped this individual to commit his last violation.

Where the actions that mark you as a considerate man really pay off is on those occasions when you apprehend the once-in-a-lifetime, or infrequent, game law violator. In those cases you are generally arresting an individual who is immediately and deeply ashamed of the fact that he has broken a law. He is worried how his family and his friends and associates will regard him when it becomes known that he is a game law violator. His pride will be hurt, and he will have lost some of his self-respect.

Here is your opportunity to demonstrate that you are a considerate man, not necessarily by letting him go free with a word of caution—I don't advocate that at all—but you have the opportunity to let him know in little ways that you, too, regret the incident and that you understand his inner feelings. How well you demonstrate consideration for other men in instances of this kind is important. If you do a good job, the individual you have just apprehended will very likely never again knowingly break a game law.

Now we have brought out that a gracious man is basically a man who is considerate of others. There is one other element I would like to touch on briefly as important in the art of being gracious, and that is this: Be a proud man, but be a modest one. To quote Will Durant, "Combine external modesty with internal pride. Your modesty will make it easy for those around you to bear with you. Your internal pride will stir you to shun meanness and sloth."

Modesty is a hard virtue to retain. Almost all of us had it as a child or as a youth, but as we grow older in our profession, we become wise through training and experience. We develop an authoritative air whenever the subject is brought up about which we are so intimately acquainted. A gracious man is a modest man.

He doesn't need to remind people that he has certain authority, that he is the boss, that he knows more, presumably, than his subordinates do. He doesn't need to take credit for the work of others in order to enhance his own position. Characteristically, the modest man looks for opportunities to give credit to others. Any man who is an authority in his profession can well afford to be modest. But at the same time that he is outwardly modest, it is important that he maintain an inner pride in himself, in his profession, and in his organization.

The best evidence of pride is dignity. Game law enforcement is a dignified profession. It should be represented by a dignified officer. If you are a proud man, as evidenced by your dignity, and with it a modest man, you will have developed quality No. 2 in the art of being gracious.

As I am sure you suspect, I am no student of the social graces, so I have covered only attributes which are obvious to me as the marks of a gracious man. I probably have left out some important considerations, but I am sure that if the Game Law Enforcement Officer will work towards (1) being considerate to all, and (2) becoming a proud man but a modest one, he will henceforth be a marked man, respected because he is a gracious individual and officer.



A NEW APPROACH TO PREDATOR MANAGEMENT IN MONTANA

By Fletcher Newby and Robert Brown, Biologists, Fur Resources and Predator Investigations

Conflict between man and the carnivores has long been a part of the Montana scene. Man's superiority as a competitive species has been ably demonstrated since the arrival of the first white man. The plains grizzly and the plains wolf have vanished. Even the little kit fox has been lost in the shuffle. The coyote, once the dominant carnivore over most of the state, in many areas has given ground to his smaller cousin, the fox, and to his arch-enemy, the bobcat. No doubt all this has made Montana a better place for man and his

domestic animals to live but carried to extreme, could seriously disrupt the natural functions of predation and could render the state a very dull place for those who enjoy all forms of wildlife.

Now that the area has been made safe for man's habitation, perhaps it is time to develop a philosophy of living more or less in harmony with the remaining members of the carnivore clan. Members of the agency charged with most of the predator control in the state, the U. S. Fish and Wildlife Service, support this

view by stating in a recent publication: "Livestock men, as well as game managers who are interested in reductional control, should adjust their thinking to the fact that both coyotes and bobcats—even though limited in numbers in many localities—are here to stay."

No other segment of the wildlife field is more influenced by sentiment, prejudice, and the weight of economic interests than is predator management. No other segment is more controversial. As a result, a serious need exists for factual information on the relationship of predators to livestock, poultry and wildlife in the state. However, the field of predator management here in the west has been characterized by a "Millions for action—pennies for research" attitude. Durward Allen, a national wildlife authority, in his book "Our Wildlife Legacy," has this to say on the subject, ". . . action without investigation often leads to waste and sometimes to catastrophe." It is therefore apparent that in order to manage predators in the most effective and economical manner and in order to transmit accurate information to the public, the Fish and Game Department must be able to draw upon a reservoir of facts gathered through investigation.

Our first step toward research has been to undertake a thorough evaluation of the major existing problems. Since it is often clear that economic losses are a source of greater conflict than any other aspect of the over-all problem, a mail survey of

predator losses on farms and ranches during 1957 was designed and executed. The Montana Department of Agriculture permitted the use of their Marketing Service mailing list of 10,087 names in this survey. Use of this list provided a sample of 29 per cent of the approximately 34,800 ranches and farms (U.S.D.A. Marketing Service, 1957) in the state. A single mailing of the questionnaire form followed ten days later by a post card reminder to non-respondents produced an excellent response of 7,526 or 75 per cent. This return constitutes a 22 per cent sample of all units in the state.

Preliminary tabulations of survey material have just been completed through the use of electric accounting machines and a few of the general conclusions which can be drawn from this information follow.

Of the 7,488 farm or ranch units returning useable questionnaires, 6,430 or 86 per cent reported having



Mr. Skunk—Number one nuisance.

livestock or poultry. Twenty-one per cent or 1,358 of these units reported predator losses of some kind.

On a statewide basis, skunk predation involving poultry and eggs, was most frequent as indicated by the number of farm or ranch units reporting predation of this type. Bobcat predation, also most often on poultry, was next in reporting frequency. Coyotes ranked third and, no surprise to sheep-men, usually preyed upon sheep. Dogs, in fourth place, also were an important predator upon sheep. In addition, dogs took all types of poultry and were responsible for nearly a third of the cattle loss.

This order of reporting frequency was not the same for all parts of the state, as might be expected. In western Montana, the coyote was reported by more units while in the southeastern part of the state the bobcat topped the list. Skunks led in central and northeastern Montana with coyote and fox, respectively, in second place.

Although millions of dollars have been spent through the years on coyote control in Montana, it is evident, even without detailed livestock valuations, that the coyote still is responsible for the greatest economic loss.

Control of the larger predators is the chief activity of the Cooperative Predator Control program administered by the U. S. Fish and Wildlife Service. Financial support is contributed by the Montana Livestock Commission, the various counties, the

U. S. Fish and Wildlife Service and the Montana Fish and Game Department. Use of "1080" poison and cyanide guns as the mainstay of this program means that it finds its most effective application on livestock ranges. The Fish and Game Department contributes \$40,000 annually to this program from sportsmen's license fees.

Farmers in densely populated areas receive comparatively little help with their predator problems at present. Depredations in these localities often involve poultry losses to the smaller predators. Surveys conducted by the Fish and Game Department have shown that in the last ten years trends in populations of skunks, foxes, raccoons, bobcats and badgers, although variable, have been generally upward in many portions of Montana. The exact causes for these increases are not clear but at least two factors must be included in a partial explanation of this situation. Market demand for the long-haired furs has been much reduced. Furthermore, the drastic reductions in coyote numbers through the "1080" poison and cyanide gun program must be considered a profound change in the rangeland areas of our state. A study conducted by the U. S. Fish and Wildlife Service in seven localities where "1080" stations were employed in coyote control in other western states clearly indicated that populations of bobcats, skunks, badgers and raccoons greatly increased. It certainly is conceivable that food and perhaps social competition with



Smaller meat-eaters like foxes have increased in areas where coyote numbers have been drastically reduced.

other predators has been greatly lessened. Climatic and other less evident factors also may be involved but surely the effect of lowered mortality from less fur trapping and reduced competition with coyotes cannot be disregarded. In addition to population gains, fox and raccoon have extended their ranges greatly in recent years. Since they are new to many areas, farmers inexperienced in trapping sometimes find these animals difficult to capture. Lack of specific assistance in such situations is a weak point in our current predator management program. Agitation for enlargement of the bounty system and other complaints frequently arise in areas of this type.

Studies of the bounty system across the nation have repeatedly shown that bounties are not a constructive answer to predator problems. As an alternative, some states maintain a

state trapper force to deal with predator problems. This approach would add little that is not provided by the government hunter and would compound the costs of predator management.

Other states with similar problems have found extension instruction in trapping methods very effective in stopping losses. This system is based upon the fact that depredations usually can be charged to individual predators rather than to predatory species in general and upon the idea that the farmer, if he is an effective trapper, can take care of the problem more quickly and more economically than anyone else.

The extension trapping instructor works with groups or individuals. At group meetings he shows movies and slides of trapping, hands out informative bulletins and answers questions. Field demonstrations of simple equipment and easy trapping methods are

made to groups or individuals right on a farm where depredations are occurring. The final set may be made to catch the predator doing the damage.

This training is fast, effective, and low in cost. If the damage recurs, the farmer is trained and can handle the problem himself; or if more training is needed, he gets it in a follow-up call. This system would encourage the traditional self-reliance of the Montana citizen and would maintain the sovereignty of the private individual. Anyone interested is simply taught to help himself.

Proof of the value of this program is in the average reduction in damage losses of 80 per cent reported by Missouri farmers who learned to handle their own problems. Additional evidence of the soundness of the extension approach, with its emphasis on **damage** control through **trapping** of the offending individuals, was gained from the department mail survey of Montana ranches and farms.

Predator control measures were taken by 63 per cent of the units reporting losses. Shooting and trapping were employed more often than any other direct control measure, with two-thirds and one-third of the units, respectively, employing these methods. Government hunters were called by about one-third of the units taking some control measure. The use of poison was reported by 20 per cent of these units.

Respondents to the survey were asked to state whether losses did or

did not continue after taking the various control measures. This evaluation showed that trapping was by far the most effective method of stopping losses since three-fourths of the units using this measure reported that losses did not continue. Next most effective was shooting with half the units reporting that losses stopped. Poison was less effective since 60 per cent reported that damage continued after use of the method. Slightly over half those units which called the government hunter reported that losses continued.

In addition to the selectivity of trapping, there are some species and many situations where trapping is the only effective or feasible method of stopping losses. An excellent example is found in the statement of the Fish and Wildlife Service that "trapping is still the best way of controlling bobcats, and nothing better is in sight." Trapping must be used in densely populated areas also because of the danger of poison to dogs, livestock and human life.

In view of the success of the extension predator control program in other states, the Fish and Game Department has employed an experienced, qualified man to initiate an extension program in the High-line area of Montana. In addition to providing assistance with predator problems on farms and ranches, the services of the extension program will be available to sportsmen's clubs, youth organizations and other interested groups. Movies, slide talks, general information on predators and



The badger—a predator of minor economic importance.

trapping and pelting methods will the problems arising in this segment be presented upon request. Sportmen's groups should find demonstrations of predator calls of considerable interest. The High-Line area was selected to give the extension approach a thorough trial under Montana conditions.

Following complete evaluation and analysis of the mail survey, detailed findings will be presented at a later date in a technical bulletin which will be available to the public. The next step in research will be to review predator problems relating to game management. From this review will come an order of priority to guide the sequence of predator investigations.

We believe that the team approach of extension effort and research will

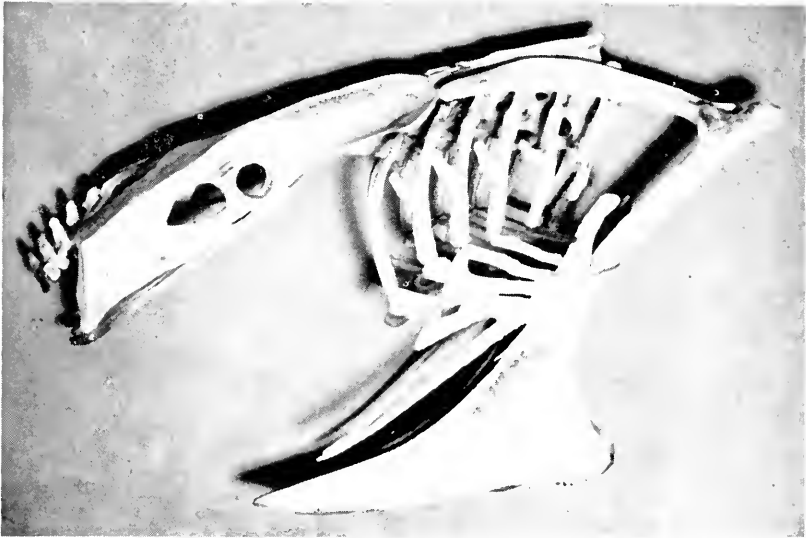
bring about the solution of many of of the wildlife field. We feel that these activities are important additions to the continuing effort of the Fish and Game Department to better serve the people of Montana.

Editor's Note: Farm, sportsmen's or youth organizations and individuals in the High-Line area interested in obtaining the services of the extension trapper program should write to:

**Extension Trapper
District Headquarters
Montana Fish and Game Department
Glasgow, Montana**

or

**Extension Trapper
Vida Route
Wolf Point, Montana**



THE LABORATORY IN MANAGEMENT

The illustration above is not any form of monster. It is a portion of a laboratory bone collection and will serve a very useful purpose.

Too often we envision a laboratory as an enchanted room studded with weird shaped glassware and occupied by bespectacled gentlemen bent over microscopes, brewing strange potions or recording mysterious formulas.

Such visions may leave us doubtful of their practical nature. But with even a casual tour of the Fish and Game Research Laboratory at Bozeman, such misgivings leave us. Here, the emphasis is on research with practical application of findings.

The laboratory, located on the Montana State College campus, had its beginning in 1955 under the fur section. During 1957 it became the Wildlife Investigations Laboratory and has since been operated under the efficient supervision of Kenneth R. Greer. The expanding facilities and services are available to all wildlife personnel throughout Montana.

At present, a primary function of the laboratory is preparation and analysis of big game stomach samples.

Whenever biologists want to know exactly what kinds and proportions of foods are being eaten by animals



These labeled jars contain food contents of game animal stomachs.

in a particular area, a study is initiated. Biologists take samples of stomach contents in the field and send them to the lab. Collections are usually obtained from hunter-kills, road-kills or winter-kills. Limited specimens taken during critical study periods supply additional scientific information from weights, measurements, lower jaws, reproductive organs, kidneys, fat deposits, etc.

Field samples are then preserved in two-quart or gallon jars. At the lab each sample is assigned a specific number and recorded with all available information. A definite amount is removed from each field sample and washed over a fine meshed screen. This eliminates all residue too small for practical identification.

Stomach samples are washed carefully to eliminate residue too small for practical identification.



The washed samples are stored in jars for future processing. Eventually, the contents will be painstakingly separated and similar food items stored in individual containers until they are identified and measured by volume. Figures from weights and



Food samples are separated and identified.

measurements of food items provide a revealing picture of animal food habits. Such information is applied to range management, game harvest, land acquisition, prey-predator studies, etc.

In one darkened room of the lab slight rustling sounds become apparent. The sounds are made by the chewing activities of thousands of skin beetles (dermestids).

The dermestid colony is utilized to clean the last remains of flesh from bones of collected specimens. Following this step in cleaning, the bones are washed, dried carefully, numbered and catalogued before examination. The skeletal collections were an important project of the fur section and are being continued.

A sample of mink have been collected from the trapped harvest each year since 1953. These samples are cleaned and examined for features that designate the specimen to be a male or female, as well as juvenile or adult. This is usually referred to as age and sex ratio data. The information is analyzed along with harvest reports and field observations to direct the future management of mink populations throughout the state.

During the past five years approximately 8,000 mink specimens have been prepared in this manner as well as 500 marten, 500 beaver skulls and 60 otters.

Several other amphibians, fish, birds and mammals have been and will be added to the various collec-



Here, a mink carcass is being prepared for the dermestids.

tions. At times this appears to be an endless task but it is acknowledged that authentic reference collections are the foundation of a laboratory. Current reference collections include study skins of birds and mammals with accompanying complete skeletons, plant specimens for the laboratory herbarium and a seed collection.

These collections are necessary to establish the identity of fragments discovered in the course of management investigations. For example, a study and collection may be required to determine the major items that elk, bear or sharp-tailed grouse are eating. Fragments from stomachs, gizzards, crops, or droppings can indicate this information. Unknown items are compared with reference collections to afford positive identification.

A large part of the work at the lab is performed by students studying for wildlife management or associated degrees. This arrangement is advantageous to both the students and to the department.



Ken Greer examines a portion of the 8,000 prepared mink specimens.

A primary advantage of the laboratory is standardization of methods, procedures and analysis. Since samples from all parts of the state are done in the same manner, comparison of food habits data from divergent areas can be readily interpreted.

The location of the lab at MSC permits their staff personnel, specialists, libraries, laboratories and supply depots to complement limited facilities. Centralization of this work also relieves wildlife biologists of

many time-consuming tasks and thus allows more valued time for other pressing demands.

As we humans grow in numbers, wildlife management must grow with us. Correspondingly, game must be managed more critically. The results are that wildlife work is constantly demanding a more scientific approach. To this end, the Wildlife Research Laboratory at Bozeman will become increasingly important in Montana's fish and game program.



Robert F. "Bob" Cooney of Helena, state game manager of the Montana Fish and Game Department, was one of ten United States professional conservationists chosen to receive the American Motors conservation award this year. He was presented with a bronze plaque at a meeting of the Western Association of Game and Fish Commissioners held in Sun Valley, Idaho last June.

Selection was made on the basis of Bob's outstanding achievements in the field of wildlife management, particularly in management of over-grazed elk ranges, in transplanting big game species and in developing new game management techniques.

The department is proud to have personnel nationally recognized as leaders in the field of wildlife management.



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