AGRICULTURE AND WILDLIFE

Proceedings of the 1984 Annual Meeting of the

MONTANA CHAPTER

OF THE WILDLIFE SOCIETY

February 15-17, 1984

Butte, Montana

FOREWARD

The 1984 Annual Meeting of the Montana Chapter of the Wildlife Society was held February 15-17 at Butte. The theme for the meeting was "Agriculture and Wildlife."

A keynote address was delivered by Keith Kelly, Director, Montana Department of Agriculture. The Chapter presented its Distinguished Service Award to Ken Walchek of the Montana Department of Fish, Wildlife and Parks.

The proceedings were compiled and edited by Program Chairman Arnold Dood. I would like to take this opportunity to thank all of those who presented papers at the meeting and those whose efforts made the annual meeting a success.

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WELCOME TO BUTTE, MONTANA

Terry Lonner[1]

This was presented to The Montana Chapter of the Wildlife Society on February 16, 1984 in Butte, Montana at the Copper King Inn. It was accompanied by a prelude consisting of a series of slides synchronized to the song "America" by Neil Diamond from the movie "The Jazz Singer". After this prelude, the following oration was read with slides presented appropriate to the words. Most of this oration was taken from the book "Mile High Mile Deep" by Richard K. O'Malley, pages 1 through 3, with some additions and deletions.

The prelude was presented by Martha A. Lonner and the oration was done by Terry N. Lonner with assistance from his wife, Martha.

And so it was, people came to America, people settled in many places, but very few places did people settle where there was a common interest with so many ethnic groups and so much diversity and yet so much similarity in trying to make a living and get by. One of these places was Butte. Beginning in 1864 they came and by 1919 there were 100,000 of them:

Such characters lived here as Nickel Annie, Fat Jack Jones the Hack Driver, Shoestring Annie, and people with names like Babich, Balkovetz, Barich, Bechtold, Bjorkman, Bullerdick, Calcaterra, Canalia, Carpino, Costello, Kelly, Dammarell, Dunfee, Eschenbacher, Evankovich, Galletti, Hurlbut, Ignatoz, Johnson, Konecny, Kowalsky, Sakellharts, Koskimaki, Leveaux, Lopez, McGarry, O'Brian, O'Billovich, Olson, Parini, Piazzola, Polkinghorn, Popoff, Quilici, Richter, Salovich, Sullivan, Troglia, Tsimanakis, Murphy, Vukmanovich, Walsh, Yeo and Ziegler.

And some of them grubbed into the hill and found copper. Others came and they ripped the guts out of the hill. They pitched gallows frames and put cages on them. And they went deep into the ground for the copper, always for the copper.

Irishmen working as far south as Leadville, Colorado heard about the Butte strike. And Finns sweating it out in the Mesabi Range of the frozen north in Minnesota heard about it. And the Swedes and the Cornish and the Montenegrins and the Italians and the Yugoslavs and the Norwegians; the Germans, the French, the Polish heard about it. And the Greeks too, but they thought in terms of restaurants; working men have to eat. And the gamblers from everywhere.

They all came to Butte. They filled its streets with the noise of a dozen tongues, and they filled its tunnels and stopes and manways with themselves and the sound of buzzies biting into the rock was loud down below.

And the smelters went up with their stacks vomiting yellow sulphurish smoke that stung and burned and polluted.

The town grew on the side of the hill, perched on its flanks and the shacks sprouted like weeds around the mines. Oh, how green was my valley. There were families that followed and it was Butte all at once. Out of the copper womb.

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[1]Montana Department of Fish, Wildlife and Parks, Bozeman, Montana.

Finntown, Hungry Hill, Dublin Gulch, Stringtown, Butchertown, Dogtown, Centerville, Meaderville, Walkerville, McQueen, Uptown, The Flats, Parrot Flat, the Cabbage Patch.

Talk English at school. Then Czech, Italian, Yugoslavian, Serbian, Finnish, Swedish, Norwegian, Polish, and German at home. The old folks don't talk English so good, Grandma don't know a word, ain't it funny, I wish Grandpa would talk something besides Gaelic, he's been here five years now. Let'em alone, they're old. They're set in their ways and what's wrong with Gaelic anyhow?

Then the whores came!

Mercury Street, Galena Street, The Black Cat, Venus Alley, 14 South Wyoming. The girls tapping with their knitting needles to catch your eye. Two bucks Jack, C'mon in. Show you a good time.

Butte, man she's wide open. Ya wan'na gamble? Step up to the Faro layout. A crop shooter? Roll'em out. Poker? Any way ya want it.

And the Chinese came, the drifters and stayons from the old railroad days. Washee shirtee? Likee noodles, fantan, Chinatown and its twistey turny way off South Main Street.

The gallows frames girted the hill then took it wholly. The Mt. Con, Mt. View, The Leonard, Speculator, Badger, The West Colusa, Granite Mtn., Original, The Berkley, Kelly, and The Neversweat.

Twenty-five miles away the biggest stack in the world went up at Anaconda and the B A & P ore trains rumbled day and night.

Get the rock in the box, where the hell is that Nipper--I need some tools--Ya can't never find a Nipper when ya want him. And the Nipper, who handed out the tools had caches in the mines. If he liked you, you got good tools, if he didn't that's tough Jack. That's all I got right now.

The powder monkeys, they're all nuts anyway and get blowed up sooner or later, swarmed down and the dynamite went into the drill holes.

Count the holes, lad always remember, when she blows count the holes. Ya put a pick in one that didn't go off and your old lady won't recognize you, if ya come hame at all.

Get the rock in the box, bend your back, the car only holds a ton. Get them grizzlies cleared. All right, take five, we got enough done for awhile, gimme a smoke, lad. Muck the rock into the car and away to the station. The chippy takes it up, if you ever rid in a chippy, lad, lay down. The way they hoist them up you'll get your brains knocked out standing up.

And the town grew. She brawled, and fought. And laughed. And tunneled, and blasted, and dug, and shoveled.

Butte, a mile high and a mile deep.

Get the rock in the box, Jack.

Things changed and economies of scale were introduced--hard rock deep shaft mining gave way to open pit mining--and so it was the Berkley Pit began in 1955.

For 27 years men and their giant machines blasted, and scooped and hauled billions of tons of rock 24 hours a day and 7 days a week until 1982 when the hill became silent.

And what now?

While here, I invite you to spend some time up on the Hill, for some of your ancestry probably contributed to its history.

WESTERN REGIONAL WORKSHOP REPORT

Lynn Nielsen[1]

The Western Regional Workshop was held at the Department of Fish, Wildlife and Parks headquarters in Missoula on Wednesday, January 11, 1984. Twenty-nine people were in attendance.

The meeting agenda included four presentations pertinent to the annual theme--agriculture and wildlife. We also heard update, from several agency representatives, concerning the current status of their respective wildlife programs.

Lynn Nielsen reported on the problems of elk depredation in agricultural fields adjacent to the Wallace Ranch, near Drummond, Montana. The Wallace Ranch is a 14,000 acre block that currently supports a herd of 450 elk. The population has been reduced--by hunting and trapping--from recent population levels as high as 700 elk.

Elk are yearlong residents on the Wallace Ranch. Exceptions to yearlong residency include individuals that leave the ranch to calve, individuals that leave the ranch during severe winter weather, and the entire herd that leaves the ranch, during late summer evenings, to forage in the neighboring second growth alfalfa fields. This last exception is the problem.

The Wallace Ranch is not typical yearlong elk habitat. Three factors seem to contribute to yearlong occupancy:

1. The ranch is an established sanctuary--it has been closed to hunting for 30 years.
2. Except for recent leases, the ranch has been ungrazed for 20 years because it currently is not a working ranch. However, there is grazing on adjacent Forest Service allotments, habitats that are more typical of elk summer range.
3. Typical elk summer range on adjacent Forest Service land also has been extremely logged.

Management that has been attempted include:

1. Road closures on adjacent Forest Service land.
2. Walk-in hunts on adjacent winter range.
3. Permanent haystack yard.
4. Late season hunts have been effective when elk are off the ranch, but these have been unpopular.
5. Trapping has been expensive and the elk have become conditioned to the trap and the helicopter.
6. Herders to harass the elk from problem areas.
7. The current proposal is for an experiment with electric fence.

Dave McCleerey reported on the potential for a similar elk depredation problem to develop in the vicinity of the Chamberlain Creek study area. During the last four years, there has been an increasing tendency for elk to congregate in a posted agricultural area, adjacent to the Blackfoot Special Management Area, during the hunting season. These elk include most of the telemetry instrumented animals from the Chamberlain Creek study area. In 1983, attempts to drive the elk from the closed area were unsuccessful. Elk left, but they soon returned.

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[1]Montana Department of Fish, Wildlife and Parks, Deer Lodge, Montana.

So far, the land owner has not complained about depredation. This, in part, is because the current management direction for the posted lands is unclear. If the ranch operation changes, depredation could be a serious problem.

To date, the principle problem is the reduced opportunity for elk hunting in the special management area, because the elk aren't there.

During 1984, hazing and grazing in the posted area will be modified in an attempt to discourage elk use. It also may be possible to modify management of the walk-in hunting area.

Loren Butler, Mountain Scent and Bugle Co., reported on experiments that his company has conducted to reduce agricultural damage.

Mountain Scent has worked primarily with white-tailed deer in the Bitterroot and with lesser numbers of elk and black bear. They have attempted to aversively condition deer to an odor repellant, using their "Spooker System". Deer that approach the haystack are presented with the conditioning odor--a chemical that smells to humans like vanilla--and then are dosed with a high-speed, pneumatic pellet gun and a siren. For this system to be at all effective:

1. Human involvement must be eliminated or the deer will condition to human scent. Therefore, the equipment is operated remotely.
2. The conditioning odor must be unnatural and volatile at low temperatures.
3. Physical contact is required to condition the animal.

Deer begin to habituate to odors within a week. Adversive conditioning has a maximum duration of 3 weeks if the animals are treated twice. However, once individual deer begin to use the haystack, other animals quickly habituate to the odor. If there are no other choices, animals under nutritional stress also habituate to odors.

Conditioning with the "Spooker System" is expensive. Conditioning may be of value to an individual rancher. However, it just moves the animals to other haystacks. Thus, it has limited application where game damage is extensive.

Other research has shown that:

1. Electronic equipment doesn't work well during winter because snow and winter pelts are good insulators.
2. Bear seem to condition more readily than deer. However, with the "Spooker System" there is a greater possibility for eye damage because bear tend to turn toward the gun. For bear, the system has been modified to place the siren and the gun in different locations.
3. Repellants, applied to hay, that are sufficient to discourage deer use also render the hay unfit for livestock.
4. It is possible to imprint captive animals sufficiently that they will starve rather than use a food source. So far, it has not been possible to condition wild animals this effectively.

Presently, 12 states support research to reduce agricultural damage.

Mike Casey, Flathead County Rural Resource Development Council, reported on the recently initiated program to preserve agricultural land in the Flathead Valley.

The Farmland Protective Act of 1981 established legislative support to the concept of preserving prime agricultural land.

The Flathead County Conservation District established the Council because the District is concerned with the loss of prime agricultural land to subdivisions in Flathead Valley. Flathead County has something unique and it is trying to preserve it. There are good opportunities to do so because Flathead County has a diverse economy--supported by timber, Anaconda Aluminum, tourism,

recreation, and agriculture. The agriculture also is diverse--no single crop represents more than 10% of the agricultural income.

The Conservation District is concerned with agricultural land, but it also recognizes the importance of wildlife, soils, clean air and water, and scenic vistas. The District also recognizes the need to relate its program to the desires of the community. Thus, the Council was established as a citizen's committee that represents several diverse interests.

The Council will be attempting to make land appraisals using an established system--LESA (Land Evaluation and Site Assessment). This system rates land according to current soil survey information and community values. It allows for an objective point system for each land use. The value of a system like LESA is that it is legally defensible and it forces County Commissioners to make land use decisions in a consistent fashion.

For landowners to participate in a program to preserve agricultural land, they must be compensated for their equity. The Council is considering a system for Transfer of Development Rights. By this system, low density development rights are assigned to all land. Certain areas are specified where development may occur at a higher density, however the developer must purchase the right to develop from other landowners. Once the rights have been sold, the land associated with those rights may not be developed.

Ron Escano, Northern Region Forest Service, gave a brief report on Habitat Suitability Models. HSI is a tool to identify the amount of suitable habitat available for a species, it is driven by standard habitat data, and is relatively inexpensive to operate on a desk top computer.

Ed Schneegas, Northern Region Forest Service, reported that the Forest Service is moving toward management by objective. For example, the ten Forests in Montana have been evaluated according to their capability to support elk on winter range. Budgets will be allocated according to this capability. Similarly, wildlife budgets among the Regions also will be allocated by objectives.

The Forest Service has developed a "Grizzly Bear Initiative" that outlines necessary programs for grizzly bear. This has been successful in getting money back into the Region for bear work. The Region also has initiated a Grizzly Bear Action Plan.

Last year, Region One had 8 formal and 81 informal consultations with the Fish and Wildlife Service.

Dave McCleerey, BLM, Missoula, summarized the wildlife program of the Butte District, BLM. The organization of the District includes 3 resource areas: Headwater (Butte), Dillon, and the Garnet Resource Area (Missoula).

An extensive inventory of land in the Garnet Resource Area has been completed. Their current direction is to complete an intensive inventory to include: habitat types, habitat components, highlighted wildlife species, T&E species, sensitive species, and nongame species.

The BLM nongame program includes developing policy and management direction for snags, riparian habitat, old-growth, natural park buffers, special habitat features, and forest residues.

The BLM wildlife program also includes monitoring, habitat improvement and habitat planning.

Kleinschmidt Lake (near Ovando) has been developed as a Canada goose nesting habitat. The program has included nest structures and release of young birds. This program resulted in the successful establishment of a breeding population.

Joe Ball of the Cooperative Wildlife Research Unit, assured us that the Unit is alive and well (at least through next fiscal year). The Unit is a cooperative effort--the Fish and Wildlife Service provides 2 salaries and $4,000 operations, MDFWP provides $10,000 operations and supports 1-3 projects, the Wildlife Management Institute contributes $1,000 and the University provides the office and secretary.

The Unit operates primarily on grants and contracts. This source funds 20-30 projects per year, principally graduate students.

Recent press releases concerning the Unit and golden eagles have not been accurate. This spring, Bart will be monitoring sheep losses to golden eagles. Scarecrows may be sufficient to deter eagles from taking lambs. If that doesn't work, it may be possible to identify the offending birds, capture them with a net gun, and relocate them.

Joe's primary interest is with Canada geese in the Flathead Valley. Nest structures work very well with geese, but maintenance is a problem. He is trying to develop a structure that requires maintenance only every 5 years.

Lorin Hicks of Plum Creek Timber Company (formerly Burlington Northern) stated that the Little Sleeping Child land exchange was culminated this year. Plum Creek purchased this Bitterroot Valley elk winter range at subdivision rates, and then traded with the Forest Service for scattered parcels elsewhere in Ravalli County.

The Redgate Special Management Area, which employs the green dot road closure system, was initiated on a block of company land west of Kalispell. Results the first year were encouraging. Plum Creek intends to initiate a similar area near Missoula and two areas in Idaho next year.

The Thompson River deer study, in cooperation with MDFWP and U of M is beginning this year.

Plum Creek also is participating in the bald eagle working group, and programs to monitor water quality in the Madison and Gallatin drainages.

Plum Creek has been intensively surveying winter ranges in company land to evaluate post-sale response. They also plan to burn some winter range in the Libby area next spring.

Mike Aberhold, MDFWP Regional Information Officer, Kalispell, reported on a variety of Department related matters.

The black bear is the "forgotten" big game species in Montana. Future management will be more intense and future seasons will be more restrictive.

The March issue of Montana Outdoors will have an article on bear misidentification. The Department also will have an I&E effort on this problem.

Statewide, the main issue this year has been the mule deer population increase, and associated problems in eastern Montana.

Road management is still the number one wildlife issue in western Montana. The public demand for forest roads already has been satisfied.

Mountain grouse surveys indicate low population levels. The Department is considering a turkey season in northwest Montana.

The nongame funding check-off system goes into effect this year. The first programs to be funded will be in I&E.

There was excellent pheasant hunting at Ninepipe this year, despite no planted birds.

Wayne Kasworm, MDFWP Biologist in Libby, presented an interesting summary of his bear study, funded by U.S. Borax. The grizzly bear recovery plan targeted the Cabinet/Yaak area as one of three places for an intensive recovery effort.

Objectives for the study in the Cabinets are:

1. Trapping black and grizzly bear to identify habitat and movement.
2. Identify conflicts with mining.
3. Develop management recommendations.
4. Evaluate black and grizzly relationships.

Chris Yde, MDFWP Biologist in Kalispell, indicated that the Northwest Power Planning Act, 1980, authorized BPA to fund mitigation for prior hydro-development. The Department is seeking funding from this source. Currently, impact assessments at five Montana sites are being developed. The next phase will be to develop mitigation alternatives to be discussed with the various cooperating agencies.

A COOPERATIVE PERSPECTIVE

Keith Kelly[1]

Being a spokesman for agriculture, I would like for a moment to reflect on the importance of agriculture to the U.S. and more specifically Montana.

Agriculture is the nation's single largest economic sector. From farm to table, it employs 22.5 million people--about 1/4th of the U.S. work force. The U.S. farmer today raises enough food to feed himself and 78 others.

As is true for the country as a whole, Montana's number one industry is agriculture.

Approximately 23,000 families make their living in our Number 1 industry--agriculture--which accounts for 40 percent of the state's economy.

Montana has 93 million acres within its borders with the Continental Divide at our northern and southern borders. Rich minerals and precious metals are locked in these mountains which are covered with vast timber resources.

There are 801,000 Montanans occupying these 93 million acres of land, of which 51 million acres are in private ownership. Of that, 51 million acres are range pastures and woodlands, leaving 13 million acres for crop production.

When you drive for a hundred miles from Helena and pass through only a few communities on your way to the next major town, it may be hard to believe that we may be running short of land for whatever use we desire.

It is this lack of recognition, and of the land resource upon which it depends, that could spell trouble in the future for not only Montanans but for all who eat. The obvious impact of land use changes in Montana is directly related to this problem.

A major area of land use change that has an enormous impact is urban sprawl.

A letter addressed to the Department of Agriculture says: We are traveling through your beautiful state on our vacation and we would like to buy a "small farm" big enough so that we can raise our own food, in the mountains, preferably with a stream or lake on it and close to town where we can sell our excess crops and get a job.

This kind of correspondence is received in the Department nearly every day.

Approximately seventeen percent of our nation's agricultural land is located on the periphery of expanding urban centers. Around nearly every city in the nation you will find that prime agriculture land has signs put up by real estate companies that are attracting families from city centers to move to a "place in the country". As families migrate to suburban areas so move stores, streets, sewers and all of the things that let people live in the country and work in the city, thus bidding land away from agricultural production and wildlife habitat. Therefore, contrary to the statement that agriculture is a renewable resource, it is only renewable if the land is preserved.

The question arises, how then does agriculture impact the wildlife sector?

As you know, much has been said about agriculture being an adversary to wildlife interests. Sometimes it may appear we are on the other side of the fence, but in fact the opposite is true.

The agricultural community and wildlife society have worked cooperatively on many issues.

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[1]Director, Montana Department of Agriculture

The endrin issue beginning in 1981 involved cooperation between the State Department of Agriculture and the Department of Fish, Wildlife and Parks. This effort required coordination at the field level between technical personnel involved in sampling as well as administrative people from both agencies when policy decisions were required. Generally, I think this effort went well and proved that we could work together even though our concerns and approaches were different.

In the whole endrin controversy I feel that the landowners who allowed agency personnel access to their endrin treated acreages deserve our thanks. From their perspective I'm sure they felt that they had the most to lose and least to gain during the process. The environmental samples (including waterfowl and wildlife, soil, vegetation, water, sediment, etc.) that were collected and analyzed for endrin residues in 1981 and 1982 could not have been obtained without their cooperation.

During the 1983 Legislative session several wildlife issues were supported by agricultural interests. These included the Game Farm Bill and the Non-game Wildlife Bill. Conversely, several situations in which agricultural concerns received environmental and wildlife groups support were also addressed. These included:

1. Deer and antelope problem in haystacks in eastern Montana this past winter.
2. Support of the Compound 1080 Columbian Ground Squirrel program.
3. Support of a proposal to use Compound 1080 in single lethal dose baits for coyote management.
4. Support of the greenhouse at Montana State University for biological weed control research.

An excerpt from the "Spirit of GTA" is an excellent summation of the relationship of Agriculture to wildlife preservation.

"Farming is one of the purest forms of free enterprise. The land is a proving ground for the world's most advanced farm technology. Farmers are bold, business risk-takers, who take winning in stride. And accept losses philosophically. They are America's first and foremost environmentalists, respecters of nature and protectors of the land."

The late Wayne Bratten of Winnett County whose grazing land was plowed under after its sale, was a man such as this according to his friend, Bubb Nunn. Nunn says of Wayne, "He was the greatest conservationist you ever seen. When I came here he run about 650 head of cows. A range hog woulda run 1,200 head of cows. He always had grass and took care of everything, the country, his cattle. There wasn't a man who worked for him or anybody that'd ever say that he'd overused this country. He always left enough for the game and everything."

Wayne Bratten was caught up in the sodbusting controversy as was the agricultural and wildlife communities. The cooperation between these groups helped work toward the alleviation of a common problem.

As you can see, the relationship between wildlife interests and agricultural interests are varied and complex. This is particularly true in Montana where the types of agricultural land vary almost as much as the various types of wildlife that use portions of it during the year. When conflicts arise we need to sort out the basic issues and see if we can reach a compromise that takes into account the input from both sides. I believe that we can resolve many of our differences if we can sit down with an open mind and hear each other out. This is at least a beginning.

WHERE HAVE ALL THE MALLARDS GONE?
An overview of the Problem of Low Waterfowl Recruitment on the North American Prairies

Thomas C. Hinz[1]

As Montana's representative to the Central Flyway Technical Committee, I recently became aware of the problem of poor duck recruitment, particularly in early nesting species such as the mallard. As early as 1980, duck recruitment studies became the primary focus of this group, whose attention was eventually drawn by researchers from the Northern Prairie Wildlife Research Center in Jamestown, North Dakota. These researchers, having investigated the ecology of prairie nesting ducks for 15-20 years, offered suggestions, advice and direction for Central Flyway mallard management. In particular, the work of Harold Duebbert, Al Sargent, Lew Cowardin and Doug Johnson was carefully evaluated by the Technical Committee. The latter two, Cowardin and Johnson, developed a mallard model which offered a predictive tool for evaluating future management options which the Central Flyway management agencies could use to reverse the mallard population trend. The first group of slides presented here are the result of the work of these 4 individuals and outlines the problems of low waterfowl recruitment, the reason for it, and the challenge to management to alleviate it. Simply the problem of low waterfowl recruitment is the result of the loss of upland nesting habitat on the prairies which has caused ducks to nest in the few remaining coverts which also are shared by nest predators, producing sizeable losses. Consequently, the challenge to management is to exercise management options on public and private land to improve recruitment by improving nest success through limiting predation of nests with the use of islands, predator-excluding fence, and through predator control.

The second group of slides outlines the results of a cooperative duck nesting study conducted in Montana and North and South Dakota in 1983. This study was designed by the Central Flyway Technical Committee and was wholly funded by the Central Flyway Council states to evaluate duck nesting success in nine areas of the three major production states. The results have provided an expanded data base from which the Cowardin Mallard Model may draw and in return will serve to provide the means for evaluating the cost effectiveness of implementing management options in the various production areas to produce the most mallards. The Central Flyway Council and Technical Committee will continue to address the mallard problem as its primary concern through:

1. Continued funding of the Cowardin Model.
2. Developing a Central Flyway Mallard Management Plan.
3. Forming a joint Central/Mississippi Flyway Mallard Management Subcommittee.
4. Evaluating the currently available mallard data base and harvest regime to determine what the future mallard hunting regulations should be.

These endeavors will serve as a starting point for North American waterfowl management agencies to correct the population decline of the most prized waterfowl species in North America so as to continue to provide sufficient numbers of mallards for the enjoyment of waterfowl hunters and other users in perpetuity.

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[1]Montana Department of Fish, Wildlife and Parks, Miles City, Montana.

SLIDE SHOW FOR RIPARIAN AND WETLANDS TAX INCENTIVE LEGISLATION

Paul Brouha[1]

SLIDES	1. DEFINITION AND INTRODUCTION
Graphic	1. The riparian area: A network of valuable resources.
Water/riparian/ upland interface	2. Riparian areas are unique portions of our environment in Montana. They support diverse resources and life greatly disproportionate to their small area.
Riparian area in arid country	3. Supplied with the richest soil and an excess of water, they support lush vegetation often in stark contrast to surrounding upland areas, thus making them attractive and extremely productive for a variety of uses.
Lush riparian vegetation	4. Trees, shrubs, and grasses attain their best growth here and wildlife and fish species abound as nowhere else because their basic needs for food, cover, and water are readily met.
Well managed riparian area	5. Man also has been drawn to this area because of its productivity, level terrain, and ease of access. With careful management the area can provide abundantly for man in perpetuity.
Streamside vegetation and clear water	6. Riparian areas are acre for acre the most important lands for producing renewable resources to be found in Montana. Yet as important as they are they add up to less than 1/2% of Montana's land area.
Riparian area in forested land	7. There continues to be considerable controversy as to just what a riparian area is, what it should be, and how to define it, understand it, and manage it properly.
Riparian with lots of sky to print: 1. Definition 2. Values 3. Management 4. Program	8. This presentation is intended to create a better understanding of riparian areas by defining what they are, discussing riparian resource values, highlighting existing management practices, and introducing a voluntary program to foster use of good management practices on these areas throughout Montana.
GRAPHIC Shows riparian area on either side of stream along with adjacent upland	9. Simply, riparian areas are the banks of streams, rivers, lakes, and other wetlands. They are the transition zones between water and adjacent uplands and are identified by soil characteristics and vegetation that requires abundant water.

[1] United States Forest Service, Missoula, Montana.

Marsh area in arid country

10. Montana has a variety of riparian areas associated with lakes, ponds, rivers, streams, marshes, and.....

Wet meadow in timbered area next to stream with moose

11. ....wet meadows. Each riparian area is unique and provides diverse plant, wildlife, fish, soil, and water features.

Broad valley photo

12. Riparian areas vary in topography, shape, size, and form. Some are broad....

Canyon area next to river

13. ....while others are very narrow and consist only of linear strips of vegetation between steep canyon walls.

Waterfowl production area

14. In Eastern Montana wetlands next to pothole lakes and low gradient streams are important riparian areas.

2. VALUES OF RIPARIAN AREAS

Riparian bottom contrasting with upland

15. What are riparian resources? There are many resources dependent on this small land area that are noticeably different from the resources of the adjacent uplands.

Stream with subirrigated vegetation

16. Water- both above and below ground is the most obvious resource.

Lush vegetation after flood has left sediment deposited on it

17. The gentle terrain and dense vegetation provide a zone for intercepting and trapping rich water-borne topsoils from upland slopes.

Streambank vegetation binding and stabilizing bank after a flood

18. The variety of grasses, shrubs, and trees helps slow floodwaters, stabilizes streambanks, and reduces erosion. Over long periods of time stream channels are ever-changing and naturally dynamic. Vigorous riparian vegetation controls and governs this natural process.

Shaded riparian area with stream

19. The moisture and shade from trees and shrubs cools and reduces extreme changes in air, soil, and water temperatures.

Clear water over clean stream gravels

20. Rich spongy soils, mulched and cooled by lush vegetation sustains year-round flows of cool clear water.

GRAPHIC
1. Sediment filter
2. Bank stability
3. Shade
4. Perennial flow

21. In summary natural values of riparian areas are based on vegetation that acts as a sediment filter, promotes streambank stability, provides shade, and perennial flow.

GRAPHIC
Net with physical features on it

22. Such features of water, soil, and vegetation form a balanced environment, a network, highly productive of life. The interrelationship of these features can be likened to a fisherman's net. Each feature makes up a cord of the net. When maintained the net can stand much use with the strength and flexibility provided by the intertwining of its parts.

Net with a strand broken and a resource missing

23. However, if misuse occurs (a strand or two breaks), the net weakens. Without repair and maintenance of any one riparian area feature--soil, water, or vegetation--less life can be supported.

Good trout habitat	24. When the network of physical features is strong, high quality fish habitat develops and aquatic life is healthy.
GRAPHIC Showing stratification	25. Numerous wildlife species are supported by the riparian vegetation. This wildlife diversity results from a varied vegetation structure as well as from having many different species of plants.
Riparian area with six point bull elk	26. Wildlife often use riparian areas as travel lanes, and big game usually bear their young near wet meadows and stream bottoms. Many wildlife managers regard riparian areas as the single most important wildlife habitat.
Road compatibly situated along a stream	27. Riparian areas and their resources are also used by man in a variety of ways; these may include the siting of towns, railroad rights of way, electric transmission lines, and roads.
Compatible logging	28. Harvesting of timber....
Compatible grazing	29. ....grazing of livestock----
Well managed cropland near stream	30. ....planting and harvesting of row and hay crops are also included.
Fisherman next to stream	31. Hunting, trapping, fishing, and other recreational pursuits are other favored uses.
Broad timbered riparian zone	32. Man is attracted to riparian areas because of level terrain, vigorous timber growth....
Alluvial willow and grass flat	33. ....highly palatable forage, productive rock-free topsoils, available water,....
River scene	34. ....and the shear beauty of them.
GRAPHIC 1. Fish 2. Wildlife 3. Man	35. In summary, the interrelationship of physical features provides for many uses by fish, wildlife, and man.

3. DEGRADED AREAS AND LOST VALUES

Close shot of fill slope erosion	36. Disturbance of vegetation and soil are the primary problems that occur in riparian areas. Nearly all of man's activities along streambanks or on adjacent upland slopes affect the vegetation and soil. How far can man go without weakening a cord in the productive network of a riparian area?
Logged out drainage	37. When streamside vegetation is depleted or streamside soils destabilized the whole life support system of the riparian area is harmed. Care must be given when timber is being harvested, ...
Recent construction	38. ....roads are being constructed,....
Livestock grazing	39. ....or when livestock are being grazed.
Grazing under management	40. Grazing use by livestock, if properly controlled and managed, can be a compatible and desirable use of riparian forage.

Over-utilized shrubs and trampled banks

41. Prolonged uncontrolled grazing by livestock or big game in riparian areas however, will result in destruction of grasses, forbs, and shrubs, trampling of streambanks, and the compaction of soil.

Riparian zone grazed to "bluegrass" and bare earth stage

42. When streamside vegetation is destroyed there is nothing to shade and cool the water and soil, nothing to filter sediment from flood waters moving off upland slopes, and nothing to hold streambanks together.

Arid, compacted, dished out, stream channel that has been overgrazed

43. The stream channel often becomes more eroded and "dished out". As the channel widens, the water table drops and the strip of riparian vegetation becomes narrower as upland plants take over the newly dried out areas. In extreme cases year-round stream-flow and all riparian plants may be lost.

Improper road location and timber harvest

44. Similar long-term damage can occur from improper timber harvesting methods, excessive recreation use, and the construction of roads....

Cropland next to stream

45. ....and from land clearing and planting of row crops too close to stream channels.

Channelized stream next to highway

46. Road development, in particular, can drastically change the entire structure of riparian areas, if extensive tracts of vegetation are removed and streams are channelized.

Aerial view of braided stream channel

47. When stream gradients are steepened as often occurs during channelization, water flows much faster and erodes streambeds and banks. The water carries the sediment downstream and deposits it as velocities are again reduced below the channelized section. Unstable braided channels result.

Dewatered channel

48. A final activity that severely weakens and changes the character of the riparian producing network is excessive and poorly timed diversion of stream flows or the drainage of wetlands. The resulting loss of water during critical riparian plant growth stages can cause plant species changes. Upland plant species gradually invade what were once moist sites.

4. MANAGEMENT APPROACHES AND CASE STUDIES

Ranger with tasks

49. These riparian problems are not confined to private lands but occur on public lands throughout Montana as well. The task at hand is to identify harmful activities that reduce the productive capacity and soil and water protection capabilities of riparian areas.

GRAPHIC
Riparian components integrated together

50. Today landowners and managers are not looking to benefit only a single resource, they are identifying ways of achieveing a mix of managed uses on riparian and adjacent water and upland areas that preserves the highly productive riparian area network.

Helicopter logging	51. New methods are being developed in timber harvesting.
Cows grazing	52. The grazing of livestock has recently received a great deal of attention as one use of riparian areas. Several grazing methods have been demonstrated that maintain or improve riparian habitat.
Streambank fencing and vegetation contrast	53. Fencing may be necessary to properly apply a grazing method. In some cases fencing may be required to temporarily or permanently exclude livestock. This method, is expensive and may be impractical, but it should be considered when other alternatives are not available.
Well-managed grazed streamside	54. Proper grazing management systems can be designed to meet riparian vegetation growth requirements. Experience has shown that not just any "rest rotation system" will do the job. A system was designed near Dillon, Montana, so that livestock made heavy use of riparian areas in only one year of three and the area was completely rested one year of three. The remaining year light grazing was scheduled during late fall or spring when animals dispersed into uplands.
Well-managed grazed streamside	55. Deferred rotation and high intensity short-term grazing such as the Savory Method accompanied by herding appears successful in maintaining riparian area resources--even with increased stocking in some cases.
Well planned rock placements with small area of riprap	56. Where channelization is necessary for specific uses, water can be slowed and directed by strategically placed boulders or armored drop structures. These devices will reduce streambed and bank scouring and allow the stream to adjust to its new channel.
Channelized section	57. The public financial burdens that can result from poor riparian area management can be illustrated by the events that occurred on Spring Creek near Lewistown, Montana after a 4200 foot long stream section was straightened and riparian vegetation removed as it was reduced to 2200 feet by a landowner eager to gain an acre of useable ground. Note the bridge in the distance. The picture was taken facing upstream. Several events occurred as a result of this work.
Eroded area upstream	58. The landowner upstream lost eight acres and 20,000 cubic yards of rich topsoil in one year.
Construction work in stream	59. A drop structure and riprap were installed to stop further head cutting. Cost $260,000.
Cracked bridge footings	60. The highway bridge footings were undermined and failed. Replacement cost of the bridge was $199,000.
Channel showing deposition	61. Material that had eroded upstream settled out below the straightened section.

Repaired section	62. As a result the channel had to be dredged, and the streambanks sloped and riprapped at a cost of $166,000.
Well vegetated streambank	63. Had the individual managed his streamside area properly and not channelized it, natural vegetation would have maintained the stability of the streambank and public costs of nearly three quarters of a million dollars would have been avoided.
Stream with flooded riparian	64. While vegetation does much, in flood plains that have high flood peaks from poorly managed watersheds, additional techniques must be used. The mix of vegetation and bank protection structures which require high public or private investment must be carefully planned and engineered.
Damaged streambank and farm buildings	65. An example is Cottonwood Creek near Helena, Montana where a 1975 flood caused extreme erosion and threatened farm buildings.
Plans	66. The site was examined and a plan developed to stabilize the bank and recover resource values while protecting buildings.
Finished construction	67. Logs were cabled into the bank, the banks reshaped and replanted with grasses and woody vegetation in 1976.
1978 scene	68. Between 1976 and 1978 nature cooperated with man and rapid revegetation occurred.
1981 scene	69. By 1981 the tremendous regrowth protected the bank and buildings from another potentially destructive flood.
1981 scene	70. The Cottonwood Creek case exemplifies current thinking about how riparian areas can be restored in contrast to the Spring Creek case where extensive use was made of high cost "hard architecture" techniques such as dredging and riprap. Success of current management techniques is dependent on complimentary upper watershed management to moderate flood peaks.

5. RIPARIAN TAX INCENTIVE LEGISLATION

Yellowstone River scene GRAPHIC NFMA 100 foot management area	71. What can be done to prevent loss of riparian area resource values? What has been done? 72. Concern for the protection and restoration of riparian areas has prompted legislation and direction for improved management of these areas on public lands. The National Forest Management Act of 1976 requires that special attention be given to land and vegetation for at least 100 feet along both sides of streams, lakes, and other bodies of water.
GRAPHIC Executive orders	73. President Carter voiced concern for riparian area management and issued two executive orders on the subject of flood plain and wetland preservation and restoration.

Stream with lush riparian area

74. Other states have recently reflected concern for improved riparian area and wetland management by enacting laws that create tax incentive programs to reward landowners that properly manage qualifying lands.

GRAPHIC
Showing management area

75. The laws provide for property tax exemption on private wetlands and lands adjacent to streams to encourage landowners to protect and restore these areas. Participating landowners pay no property tax on wetlands or on streambed and streambank up to 100 feet landward from each side of the stream channel if the landowner is managing to meet the intent of the law and is enrolled in the voluntary program.

Aerial view of riparian

76. Might such a program be good for Montana?

THE ROLE OF LANDOWNER COOPERATION IN BLACK-FOOTED FERRET RECOVERY

John Cada, Tom Campbell, Tim Clark, and Dennis Flath[1]

Abstract

In an effort to solicit cooperation of the agricultural community in impending black-footed ferret studies, a series of meetings with key leaders and landowners was held. Results of those meetings are described and generally portray a reluctant willingness to cooperate.

Procedures for following through on ferret sightings is presented as well as an established sequence of actions to be followed in the event that presence of a ferret population is confirmed.

The role of key personnel, as well as of participating agencies, is set forth.

Much of Montana's wildlife resides on private land, with some species almost completely dependent upon these lands. Success in maximizing wildlife qualities on these lands depends largely upon cooperation of private landowners. Though conflicts of uses occur, frequently the conflict is mostly perceived or feared. Consequently, many worthwhile wildlife projects are not implemented simply because of their controversial nature. Often times they never develop to the problem/conflict solving stage. An example has been Montana's endangered species program.

Montana has typically approached endangered species projects with caution because of the open resistance from agricultural interests. Until this year, the Department's involvement with endangered species has been the very least controversial: the peregrine falcon (Falco peregrinus) and the bald eagle (Haliaeetus leucocephalus). This year a significant change was made. This paper summarizes the procedure the Department used to initiate a black-footed ferret (Mustela nigripes) study and obtain the support and cooperation necessary for success.

Availability of grant-in-aid funds through Section 6 of the Endangered Species Act specifically for Montana ferret studies was the catalyst which precipitated our involvement in this study. However, before proceeding the Department felt that agriculture should be contacted and offered a role in planning the study procedure. Not only would this study be in jeopardy if a significant negative reaction came from agriculture, but it could also adversely affect implementation of the newly passed nongame income tax checkoff legislation.

Consequently, a meeting was held with all the agricultural leaders in Montana and a Department of Agriculture representative. The purpose was to notify them of the potential project, point out the benefits of and reasons for the project, and to obtain their reaction. A decision to proceed would be based upon their reaction.

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[1]Cada and Flath, Montana Department of Fish, Wildlife and Parks; Clark and Campbell, Biota Consultants.

Our main points were as follows:

1. Ferrets are indeed an endangered species and in need of recovery.
2. The best chance of recovery is now due to the discovery of the ferret population just south of Montana.
3. The Department of Fish, Wildlife and Parks is the proper agency to take the lead in this effort.
4. Our goal is to find ferrets and recover the species so that it can be downlisted or delisted.
5. If we don't do the study, the restrictions on prairie dog control will at least remain the same.

To relieve fears over the implications of ferret presence on or near private property, two Wyoming ranchers were asked to attend the meeting and to relate their experiences and feelings resulting from having ferrets on their lands. Both ranchers indicated positive feelings and no change in their ranching operations as a result of ferrets residing on their land. Also, one of the principle nongovernment researchers on the Wyoming ferret project was invited to attend and discuss their findings, general ferret and prairie dog biology, and his impressions of how private landowners felt about ferret occurrence on their land.

Similarly, the Department felt a need to inform the conservation community about our proposed ferret studies and seek their cooperation. Past experience suggested that negative publicity could seriously jeopardize a project if polarization occurred. Patience and understanding in a cooperative atmosphere is essential.

Conservation groups offered their support and cooperation, and agreed to trust the lead of the Department. This is particularly important where public information such as news releases are concerned because misunderstanding of biological principles often results in misinterpretation of study results. When such misunderstanding is presented to the public, there is a high risk of controversy and conflict, with endangered species often suffering the most severe consequences.

Key personnel representing involved or concerned agencies were also informed in the same manner as the previous 2 groups. Here, the main concern was coordination and cooperation. These personnel are participants in the study procedures and eventual management actions. Consequently it was viewed necessary to detail the role of each in the study procedure. Teamwork is essential, and each teammate must understand his (or her) appropriate role in order for the project to be fruitful. A football team with 11 quarterbacks would never win a game! Each agency must understand its proper role. FWP is responsible for wildlife management, FWS is responsible for migratory species and listed species, and FS and BLM are responsible for habitat management.

In concert with the wishes of agricultural leaders, a series of 9 public meetings was held in eastern Montana. Meeting locations included Roundup, Baker, Miles City (2), Ekalaka, Broadus, Malta, Harlem, and Roy. Public attendance ranged from 1-22. Attendees were presented information about the ferret, study procedures, and what ferret presence would mean. Open discussion was encouraged, and these question-answer sessions proved quite valuable.

Some of the input we received are summarized as follows:

1. Ranchers had few negative feelings toward the black-footed ferret.
2. Most ranchers were very concerned about the present expansion of prairie dog communities on public and private rangeland in Montana.
3. Nearly all those attending the meetings were receptive to having field personnel inventory their lands for ferrets.

4. Agriculture needs assurance that we can do what we promise regarding prairie dog management.
5. Receptiveness to maintaining ferrets and prairie dog populations on rangeland varied greatly among ranchers. Some wanted all prairie dogs removed whereas several indicated interest in maintaining some levels of prairie dogs and ferrets.

Some of the points we brought out which appeared to be well received were:

1. Proceeding with this study is better than doing nothing and hoping the problem will go away.
2. The main objective of the study is to recover the black-footed ferret, thereby to down-list and eventually delist the species.
3. One of the benefits of the study is to identify areas that are void of ferrets.
4. There are no intentions of conducting this study on private property if the landowner does not wish to cooperate. Lessees would be contacted if studies are proposed on public lands.
5. If ferrets are found, we will work closely with the landowner or lessee to ensure his inclusion in future study and management plans.
6. If ferrets are found on or near a ranching operation, both public and agency activities in those areas will be kept to an absolute minimum.

Some important conclusions obtained from the information gathered at the meetings include:

1. We can count on at least reluctant support and cooperation in all areas which potentially may harbor ferrets,
2. Most ranchers attending would willingly report ferret sightings,
3. Follow-up communication with the agricultural community will be necessary to maintain present level of interest and support.

After the public meetings were held, a conference call was made to all the agency cooperators to prioritize locations where field efforts would begin and to develop a set of procedures to follow when ferret sightings and reports were made.

The basic assumptions used in determining priority areas of study were:

1. The choice of study areas at this level will not be affected by land ownership with the possible exception of Indian lands.
2. The study areas will be located in the vicinity where the highest likelihood of finding a ferret population exists.
3. The study area priorities may change whenever new or additional information warrants a change.

Highest priority was assigned to south Fallon and north Carter counties. This area contained the most recent verified ferret observation in Montana and, except for the immediate vicinity of the sighting, had not been intensively surveyed.

The area of second priority included portions of Phillips county. Several ferret reports have come from this area and it contains numerous prairie dog communities. Some of these have had little or no prairie dog control.

The general study objective for the first winter will be to survey these priority areas in an attempt to locate ferrets. First efforts were to obtain maps showing prairie dog distribution, land ownership, obtain history of control, and prairie dog population trends.

In order to ensure optimum use of each cooperator's expertise during the inventory phase of this study, the following activities were assigned to each agency:

1. FWP
   a. Coordinate study activities with consultants, agencies, and landowners,

b. Serve as a clearing house and reaction center for ferret reports and observations,
c. Assist with field activities utilizing FWP nongame biologist and regional wildlife biologists.

2. FWS
   a. Coordinate study activities with consultants and landowners on BIA lands,
   b. Assist with aerial reconnaissance flights as requested by FWP,
   c. Assist with ferret report evaluations.
3. BLM
   a. Provide maps of all inventoried prairie dog communities in Montana for all ownerships if available. For each prairie dog community this would include: size and shape, year(s), of inventory, history of control (type of poison used, effectiveness of control, etc.), and prairie dog population trends,
   b. Assist with financial support of aerial survey.
4. USFS
   a. Provide maps of all inventoried prairie dog communities in Montana for USFS lands and associated private lands.
5. BIOTA
   a. Provide field services and guidance as requested by the FWP,
   b. Maintain flexibility in their schedule of field activities such that they can be suspended on short notice to accommodate immediate survey needs in lower priority areas.
6. BIA
   a. Provide assistance and guidance when working on or near Indian lands.
7. CMR
   a. Provide guidance and facilities when working on or near the CMR Wildlife Refuge.
8. MDA
   a. Assist with informing the public and agricultural community of the study progress and findings.

It will, of course, be necessary for each agency to maintain a great deal of flexibility during field studies to accommodate the need to respond promptly to new findings as they appear.

A procedure was developed to follow up ferret reports and/or verified sightings. The purpose of this procedure was to establish a sequence of actions that had been formerly agreed upon. Responsibility of each party is defined, thus ensuring a speedy and smooth course of action.

1. The FWP will act as a central clearing house for all ferret reports/sightings and will initiate any response procedure when ferret report/sightings have been made. To expedite transfer of report information within each agency, it is recommended that the first individual obtaining the information contact the FWP directly.
2. Information required should include as a minimum the following:
   a. Name, address and telephone number of the observer (and reporter if different),
   b. Complete description of location of observation as well as geographical location (township, range, section),
   c. Date and time of observation,
   d. Number of animals observed,
   e. Distance to animals,
   f. Length of time observed,
   g. Activity of animal(s),

h. Proximity of nearest prairie dog community,
i. Circumstances of observation.

3. Designated personnel will evaluate the validity of each report, and determine the nature of any follow-up actions. As an aid in determining validity, a scoring system has been devised which considers such variables as observer reliability, location, circumstances of observation, and description of animal.
4. If a follow-up is planned, the FWS, FWP, and Biota will be notified immediately and a decision made as to which of the agencies should begin the followup procedure. If no follow-up is planned, the information will be forwarded to the above parties by mail.
5. A follow-up search in response to a report will be as follows:
   a. One-three (max) of the involved researchers will contact private landowners in the vicinity of the search to inform them of our intentions and to solicit their support,
   b. Up to four field biologists will begin prearranged surveys,
   c. The length of time spent in the area surveying will be dependent upon the judgment of the field researchers.
6. When a ferret sighting is confirmed, immediate confidentiality will be maintained and the following action will be taken:
   a. The FWS will be notified, consulted, and impending procedure will be agreed upon,
   b. The landowner/lessee or public agency landowner will be contacted by FWP within 48 hours, if possible, to work out details of additional efforts,
   c. A low-key assessment of the black-footed ferret population will be conducted by a minimum number of field biologists and will continue for approximately 90 days,
   d. After four to six days, all cooperating agencies will be notified of the preliminary status of the sighting,
   e. Public meetings and news releases will be coordinated by the FWP in cooperation with MDA within 14 to 21 days after verification has been made,
   f. If a population of ferrets is found, meetings with affected landowners and cooperating agencies will be held to develop an interim management plan for each land ownership,
   g. After 120 to 180 days a general plan with action goals for black-footed ferret conservation and recovery will be developed.

January efforts began with private meetings with 3 landowners who own or lease portions of a prairie dog colony where several ferret sightings, including one confirmed (Seaburg 1977), have been made. Much of this colony is presently protected by a US Fish and Wildlife Service easement. All 3 landowners were cooperative in allowing searchers access and providing historical information on ferrets and prairie dogs in the area.

Field efforts began with an aerial survey of approximately 2500 acres of prairie dogs previously located and mapped. This flight was provided by the Miles City Office of the Bureau of Land Management. Following the flight, 7 days were spent searching diurnally for ferret sign (diggings, tracks). Snow conditions during this period were excellent for tracking; 7.5+cm initially, 2 fresh snows of 2+cm each. Diurnal searches were conducted on foot and motorcycle.

Nocturnal spotlight searches were conducted for 3 consecutive nights between dusk and dawn. Spotlighting was done from a moving vehicle and with a portable back-pack unit.

No evidence of recent black-footed ferret presence were found. However, diurnal sign searches produced the discovery of 2 black-footed ferret skulls from the same burrow mound. The cranium of 1 ferret was found on the surface; a second (a mandible) and several long bones were found while sifting soil from the mound. Age of the skulls is unknown but because of the portion of the colony where the discovery was made is only 4 or 5 years old, the skulls are believed no older than this. The age of the ferrets at death is also unknown, but the cranium appears from a relatively young animal based on tooth wear and sagittal crest development.

This effort is yet incomplete, and we intend to expend additional effort in the area, radiating out in concentric circles until we are satisfied that we have properly defined the status of the black-footed ferret in that area.

Although priority areas will receive the most field effort, other areas having had either previous ferret reports and/or large prairie dog communities will be surveyed using aerial reconnaissance during periods of desirable conditions.

Since this study is only in its formative stages, few results are forthcoming. We are optimistic that further efforts will result in location, identification, and appropriate recovery actions for the rarest of the rare, the black-footed ferret.

DISEASE THREATS TO WILDLIFE AND LIVESTOCK

B. F. Newcomb[1]

Livestock and various forms of wildlife utilize common ranges, especially in the Western United States, for their livelihoods. Often domestic ruminants, (cattle, sheep and goats) use common ranges with native wild ruminants, (elk, bison, deer, antelope, Big Horn sheep and Rocky Mountain goats).

Because of similarities arising from common family backgrounds some of these domestic and wild animals may suffer from the same or similar diseases. Depending on the organism causing the disease, at times the identical agent may cause similar disease syndromes in the various species.

At this time, knowledge of morbidity (number of cases of the disease in a herd), mortality (deaths caused by the disease), and incidence (frequency and location of outbreaks) of diseases affecting both wildlife and domestic animals tends to be fragmentary because disease occurrences, particularly in wildlife, have been studied only on a very limited basis.

Usually, unless the disease causes an economic problem in livestock or a zoonotic disease in man or was responsible for a spectacular die-off in wild populations, little notice has been taken of the problem, other than at a very local level, such as in observations by a biologist or incidental findings of a necropsy examination by a veterinarian.

As attention is focused more specifically on conservation of our wildlife resources by many more individuals and organizations than by the usual hunter conservation groups of the past, awareness that wild animals do die of causes other than hunter harvest becomes evident.

Many people not well versed in the ways of nature are totally astounded to find that wildlife, as does any other form of life, succumbs to a plethora of mundane, unromantic causes that range from starvation (in livestock the scientific term for this syndrome is Montana Hollow Belly) to influenzas, bacterial and viral infections, trauma and even old age.

With the concentration of livestock agriculture, increasing numbers of animals on decreasing areas, many of the problems that were once thought to be foreign to an area are now commonplace, and take their toll year after year, adding to production costs.

With increased mobility of livestock as well as concentration of numbers, the chances of exposure to a particular disease have increased markedly in the past 20 to 40 years.

Again, with animal numbers increasing in a particular area, i.e., Yellowstone bison and Jackson Hole elk, cattle in a stockyards, or overstocking a range, the chances of disease transmission within a population increase also.

In areas where wildlife move in with livestock, particularly during the winter feeding period, possibilities of cross-species disease transmission are increased tremendously.

Common use of water (especially stagnant sources), salt and feed sources also serve as points of cross-specific disease spread.

How much transmission of disease from wildlife to domestic animals or from domestic animals really does occur? Other than in the case of very few diseases, I don't really think anyone knows. In the case of rabies in

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[1]D.V.M., Chief, Disease Control Bureau, Montana Department of Livestock

Montana, transmission from a wild reservoir species, in this case, skunks to domestic species and to some other wild species, is the only source known, other than imports from another area.

Do the cattle of Montana present a danger to our large wild ruminants through transmission of several bacterial and viral diseases that can be deadly or debilitating? I don't know.

Do our wild species present an untenable danger to our domestic livestock through transmission of some economically devastating diseases, such as tuberculosis and brucellosis? I don't know.

What would happen if an exotic disease such as Foot and Mouth or Rinderpest were introduced into our domestic livestock populations, ultimately eradicated there but became enzootic in wild ruminants? I don't know, but I can imagine.

These questions and others relating to animal diseases (wild or domestic) cannot be intelligently answered or considered without a considerable amount of cooperation and research jointly carried out by veterinarians in the livestock community and wildlife biologists and veterinarians, of which there are a few, with numbers increasing.

Some of the diseases in question and under suspicion are included hereafter, but this listing is by no means meant to be complete.

Viral Diseases

1. Rabies	A threat to any warm blooded mammal. In Montana the main reservoir is skunks. All cases in other species have resulted from skunk exposure, other than a very few cases that have been imported after exposure elsewhere. Bat rabies is not known to have been the cause of outbreaks in other species.
2. Epizootic Hemorrhagic Disease	A viral disease responsible for die-offs in white-tailed deer and antelope. This disease has been confused with Blue Tongue, a virus disease of sheep, that has also been found in wild animals.
3. Blue Tongue	Virus disease of sheep transmitted by a Culicoides gnat. The viruses causing Blue Tongue and EHD are distinct but similar.
4. Pseudorabies	Virus disease affecting cattle and hogs. Raccoons can be vectors.
5. Malignant Catarrhal Fever	A viral disease of domestic and wild ruminants. Can be a severe disease in cattle. The African strain of MCF has been recently isolated in the Oklahoma City Zoo.
6. IBR, BVD, P13 (Infectious Bovine Rhinotracheitis, Bovine Virus Diarrhea, Parainfluenza Type 3)	All virus diseases of cattle seen throughout the United States in varying degrees. In Montana we have done some limited survey work in wild populations and have demonstrated antibodies to all three virus in a few animals.
7. Hog Cholera	At this time the disease has been eradicated from the United States but is present in Mexico and could transmit through feral and wild porcine.

8.	Contagious Ecthyma	Disease of domestic sheep and goats that has been found in Big Horn sheep.
9.	Exotic Diseases	Foot and Mouth, Rinderpest, Hog Cholera, African Swine Fever all could have impact on United States domestic and wild populations if introduced.

Bacterial Diseases and Other Organisms

1.	Tuberculosis	Can be transmitted from domestic to wild and vice versa under proper conditions. It is of human health significance.
2.	Brucellosis	Is of acute interest to stockmen. It is present in the Jackson Hole elk herd at levels thought to be up to 40-50%. It is of unknown level in the Yellowstone bison herd. Transmission from cattle to bison, bison to cattle, have been documented under natural conditions. Transmission from elk to cattle and vice versa have been carried out under experimental conditions. How much transmission there is under natural conditions is unknown.
3.	Leptospirosis	Spirochetal disease with numerous serotypes. Several known types reservoir in wild animals, many types may affect both domestic and wild species and man.
4.	Anaplasmosis-Protozan Disease	Enzootic in some areas of Montana; can be found in ticks. Effects both domestic and wild animals.
5.	Pasturella multocida and P. hemolytica	Ubiquitous inhabitant of lungs, transmitted readily but is more often a secondary opportunist to other insults. Recent isolation of P. hemolytica in Big Horn. Literature says P. hemolytica rarely found in the wild species.
6.	Black Leg and Malignant Edema	Clostridial diseases that are also ubiquitous and can effect the large ruminants.
7.	Parasites	Can be some transmission but tend to be more host specific.

In conclusion, almost any species is subject to diseases, particularly infectious diseases, that can and do at times effect other similar species.

What the original source of disease might have been at this time is mostly of academic interest. What must be dealt with now is the fact that, given the right circumstances, one species may be a threat to another species since it may serve as a reservoir for a disease that may adversely effect the second species.

This requires that those concerned with each species must work with each other in learning of the problems and discovering a workable middle ground on which the problems effecting both can be handled equitably.

SOME RELATIONSHIPS BETWEEN WHITE-TAILED DEER AND AGRICULTURE ON THE LOWER YELLOWSTONE RIVER

Gary L. Dusek[1]

The journals of Lewis and Clark (Koch 1941) and other early explorers and travelers document the historical occurrence of white-tailed deer (Odocoileus virginianus), or "common deer", along major streams in what is now eastern Montana. Although whitetails disappeared from much of this historic range during settlement, they subsequently recovered and may now be found throughout much of eastern Montana (Allen 1971) where floodplains and islands of major streams still provide important habitat.

White-tailed deer occur along bottomlands of many eastern Montana streams in close association with intensive agriculture. Here, the fertile soil and water, which perpetuate riparian vegetation, and thus provide habitat for whitetails, also are attractive for agricultural cropping. The relationships between deer and agriculture in these floodplain riparian/agricultural habitats are only poorly understood.

In 1980, a study to evaluate the habitat relationships and population ecology of white-tailed deer on floodplain habitats in eastern Montana was established under the statewide deer research project. The study area includes 53 miles of floodplain and islands along the lower Yellowstone River from Glendive to Sidney. This area includes a diversity of riparian and agricultural habitat types as well as an abundance of deer. In addition, in generally understanding deer habitat and agricultural relationships, the findings would provide information valuable in the Department's defense of an instream flow reservation of lower Yellowstone River water for fish and wildlife. Because most bottomlands are subjected to some form of intensive agriculture, it is difficult to ignore the effects of agricultural activities on deer and vice versa.

STUDY AREA

The lower Yellowstone River study area has been described in detail by Swenson (1978) and Dusek (1981). The entire area is intensively farmed and/or ranched with many small economic units as compared to the dryland operations in the adjacent uplands. Agricultural practices are modified by flood irrigation downstream from Intake, a diversion dam located approximately 17 miles downstream from Glendive. The Lower Yellowstone Project includes the dam and main canal, which parallels the river from Intake to 12 miles downstream from Sidney. The project influences a significant change in land use and cropping practices, from domination by livestock production upstream from Intake to domination by intensive farming for cash crops downstream.

Intensive studies were focused on three areas of river that represented varying agricultural practices. The Intake area, located about 2 miles above the diversion dam, was characterized by cattle and hay production of bottomlands and farming of small grains on adjacent uplands. The Elk Island area is located about 20 miles downstream, near Savage, and includes the Elk Island Wildlife Management Area and adjacent private lands. Agriculture is

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[1]Montana Department of Fish, Wildlife and Parks, Glendive, Montana.

dominated by production of cash crops, primarily sugar beets, small grains, and corn. Livestock production is very minor. The third unit is comprised of the Seven Sisters Wildlife Management Area, 10 miles downstream from Elk Island, and surrounding private lands. Agriculture is similar to that on Elk Island.

Successional relationships of the riparian habitat were studied in 1980-81 (Boggs 1983). The successional sequence began on gravel bars where cottonwood (Populus deltoides) and willow (Salix sp) seedlings became established following flooding. As the seedlings matured and sediment and organic matter accumulated, the sites were elevated to a level above that which was flooded each year. Willow disappeared, and, over the next 100-150 years, the cottonwoods matured, became fewer in number, and eventually died out giving way to a shrubland sere. The shrublands in turn gave way to grassland or silver sagebrush (Artemisia cana)-grasslands which appear to represent the topoedaphic climax of the region. On some sites, especially old stream channels, green ash (Fraxinus pennsylvanicus) replaced cottonwood and shrubland communities. Agricultural lands are no longer successionally related to the cottonwood seres.

METHODS

Most procedures used during the course of the study have been described elsewhere (Dusek 1981). Approximately 275 whitetails were captured and individually marked on the 3 study units by mid-February 1984. Of those 95 were equipped with radio collars. The individually marked deer provided information on habitat usage, patterns and movement and/or dispersal, population size and structure, and age-specific mortality and reproductive rates.

Habitat usage was intensively studied as a graduate research project during 1982-84. In these studies, daily and seasonal movements and habitat use were closely monitored on the Intake and Elk Island areas (Herriges 1983) using a ground-based null-peak system that employed 2-3 antenna towers (Pac 1978).

Food habits of whitetails have been studied along the entire river bottom from Glendive to Sidney by analysis of rumens from 80 deer killed on highways, by hunters, or under depredation kill permits. These data were compared with similar information obtained by Allen (1968) for Missouri River bottomlands.

RESULTS AND DISCUSSION

Data from population trend and herd composition surveys suggested that fall population numbers on the lower Yellowstone nearly doubled (3,000-6,000) from 1980 to 1983. This represented density of approximately 120 deer/mile of floodplain in fall 1983. Fawn production and/or survival declined during the same period as determined by fall fawn:adult female ratios: 112:100 in 1980, 68:100 in 1983.

Despite the relatively high deer densities on the river bottom during all years of study, depredations on agricultural crops were not widespread. Complaints about deer depredations have been most numerous where production of livestock and hay, particularly alfalfa, were the major agricultural activities. Deer damage was also a problem during years when the corn harvest was delayed.

If frequencies of complaints indicate landowner intolerance to crop depredations by deer, landowners on the river bottom were somewhat less

intolerant of deer than owners of dryland farms on upland prairies west of the study area. Damage complaints to the MDFWP Regional office Miles City from the upland prairie/agricultural area outnumber those from landowners on the river bottom by a margin of 2 to 1 (MDFWP, unpubl. data). Portions of the Yellowstone River bottom supported densities of 70+ deer/mi.^{2}, whereas an upland prairie/agricultural area near Richey had a white-tail density of 13 deer/mi.^{2} (Dusek 1983).

Telemetry data (Herriges 1983), indicated that deer limited their activity almost exclusively to riparian forest and shrubland habitats during daylight. Adult females appeared to be particularly tied to these communities during the early summer (fawning) period. Use of agricultural fields occurred primarily during hours of twilight and darkness.

Most of the summer deer use of agricultural fields was in alfalfa. In winter deer used a variety of fields, though beet fields appeared to be especially heavily used on segments of river bottom where they occurred.

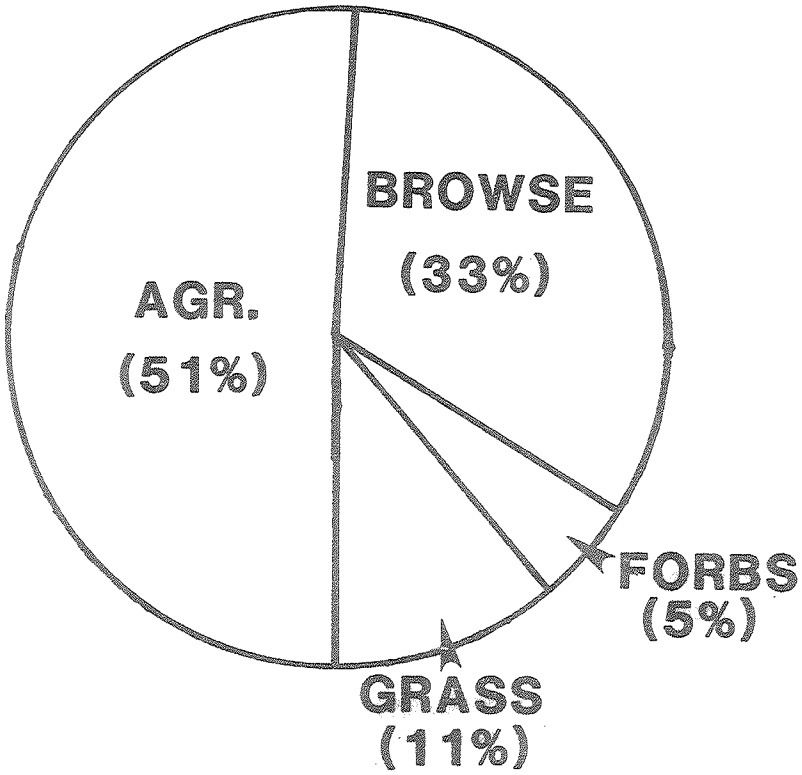
Crop rotation practices may influence circadian movements of deer most significantly during winter when they most heavily used crops that are rotated annually. During winter, radio-collared whitetails continued to forage selectively on the river bottom even under the severest weather conditions.

Agricultural crops accounted for 43.5 percent by volume of the yearlong diet of whitetails on the lower Yellowstone. Browse ranked second, accounting for 37.5 percent. Deer used greater amounts of agricultural crops from late fall to early spring than during the growing season (Figure 1). Data were compiled and analyzed only for these two time periods, within which items used by deer changed very little. Native browse received more use than agricultural crops during the growing season (May-September) when alfalfa accounted for nearly all of the crop forage. From late fall to early spring sugar beets accounted for more than half of the agricultural crops used (Figure 2). Since sugar beets are raised on only about half of the study area, these data may grossly underestimate their use by deer on segments of river bottom where they are raised. Wheat and alfalfa were abundant in rumen samples from areas above Intake.

One question often asked is whether or not a segment of river bottom habitat lacking agricultural crops would support deer at densities similar to those on the lower Yellowstone. I cannot answer the question entirely, though the studies of Allen (1968) and others on the Missouri River indicate it would not. I compared food habits on the lower Yellowstone with those reported by Allen (1968) for a 23 mile segment of Missouri River bottomland above Fort Peck Reservoir (Table 1). Riparian communities on the Missouri were similar to those on the Yellowstone. Agriculturally, approximately 25 percent of the Missouri River bottomlands were in alfalfa meadows while other crops occurred in only minor amounts or were absent. The relative use of forage classes was similar for the two areas in summer. During other seasons, forage use on the Missouri reflected the absence of agricultural crops other than alfalfa (Table 1). Deer used major browse items, including snowberry (Symphoricarpos spp.) and cottonwood, on both areas at about the same frequency. Lower condition indices and lower, more variable fawn production among deer on the Missouri as compared with the lower Yellowstone, suggest that the former existed on a lower nutritional plane. Hamlin (1980) reported a density of 22.5 deer/mi.^{2} on the Missouri bottomlands, considerably less than densities on the lower Yellowstone (Swenson 1978, Dusek 1982).

In conclusion, my studies and the data presented here provide further documentation of the close association of white-tailed deer and agriculture

PERCENT OF SEASONAL DIET



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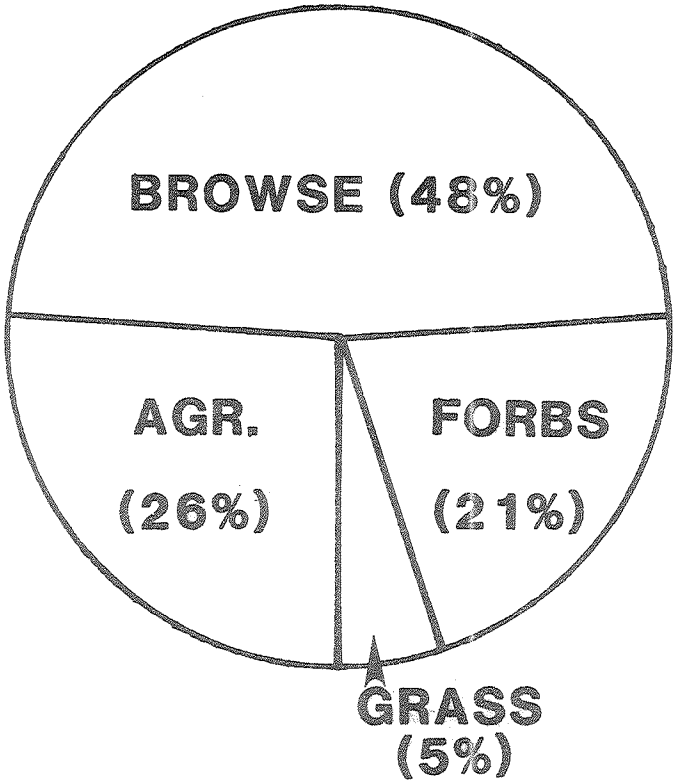
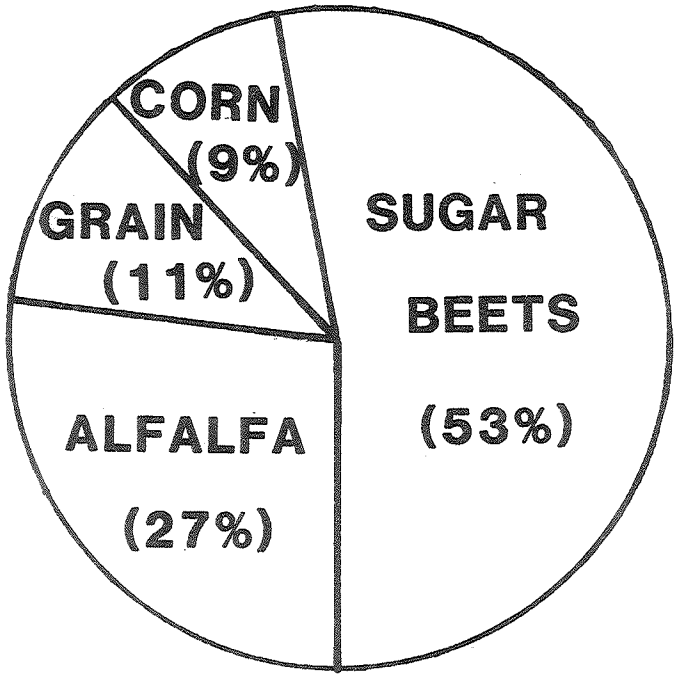


MAY - SEPT.

PERCENT OF AGRICULTURAL CROPS IN SEASONAL DIET



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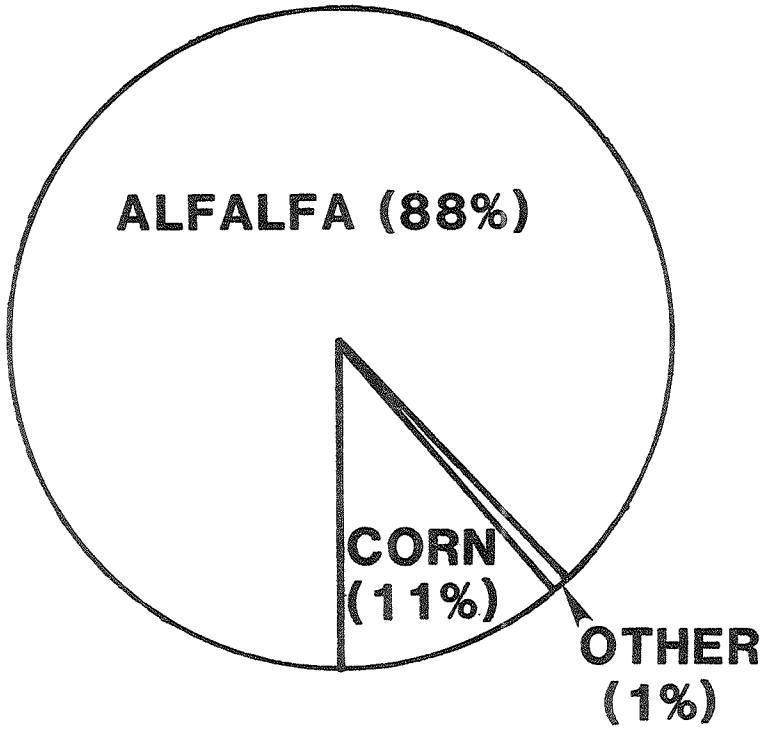

MAY - SEPT.

Table 1. Comparison of seasonal forage use by white-tailed deer on the Yellowstone and Missouri Rivers.

	Summer	Fall	Winter	Spring
Brownse:				
YSR	44[a]	40	48	11
MR[b]	45	81	65	43
Forbs:[c]				
YSR	28	5	7	3
MR	15	10	29	16
Agr. Crops:				
YSR	24	49	35	68
MR	39	7	5	16

[a]Expressed as a percentage of the seasonal diet.

[b]Data is from Allen (1968).

[c]Does not include agricultural crops.

in eastern Montana. Swenson (et al. 1983) indicated that about 71% of the whitetails in eastern Montana winter in association of agriculture of some kind. Agriculture apparently introduces a habitat component or components that enable eastern Montana habitats to sustain greater numbers or densities of deer than would exist otherwise.

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ORGANIC FARMING, REDUCED TILLAGE AND MONTANA WILDLIFE

Terry Cacek[1]

For us non-residents, Montana evokes images of high mountains, tall forests and vast grazing lands. These ecosystems do occupy the greatest portion of Montana. Only 19 percent of Montana's surface area is devoted to crop production (National Agricultural Lands Study 1981), but I believe that farming has had and is having a greater impact on Montana's fish and wildlife than any other industry. You will note that bighorn sheep still grace the high mountains and elk continue to prowl the forests, but only the ghosts of the buffalo haunt the plains.

Many of you have devoted your lives to the protection of Montana's mountain and range ecosystems. Every proposed dam, ski development, and clear cut looms as an intolerable threat. But, from my distant perspective, I see that your forests and range lands are largely intact. A forest can be clear cut and, within a few decades, it is replaced by a new forest somewhat similar to the original. A cow can nip off a blade of grass and it will grow back.

But once the plow bites into the prairie sod, that ecosystem is lost forever. The moldboard plow literally turns the perennial ecosystem upside-down and the farmer replaces it with a fundamentally different and far simpler ecosystem composed of annual grasses. Agriculture has proved incompatible with buffalo, elk, wolves, and grizzly bears.

However, the impacts are not all bad. A mosaic of croplands and rangelands may be more productive than vast expanses of rangelands. Ecologists unfairly condemn croplands for their lack of diversity. But a vast area of rangeland interspersed with a few agricultural monocultures is more diverse than a vast area of rangeland without these monocultures. Pheasants, doves, black-tailed jackrabbits, white-tailed deer, and fox have benefited from agriculture.

The problem of habitat depletion develops when agriculture becomes too intensive. When ecosystems are dominated by wheat, the wheat decreases rather than increases diversity.

Intensification also brings chemicals. Your recent experience with endrin punctuated the dangers of chemicals, so I need not dwell on them.

Intensive agriculture also brings soil erosion. Wind and water erode 5 tons of soil per acre, on the average, from Montana croplands every year (U.S. Department of Agriculture 1980a). The total annual loss from Montana croplands is 75 million tons per year.

Next we have to consider what happens to that 75 million tons of soil. Most of it ends up in your lakes and streams. Almost certainly, this 75 million tons of soil is the worst water pollutant in Montana.

When we consider water use, the numbers become overwhelming. Agriculture accounts for only 19 percent of the land use in Montana but it accounts for 98 percent of the withdrawals of surface water (Guehlstorff personal communication).

The impacts of agriculture on Montana's wildlife are not static, but are in a state of flux. The most abrupt land use change in Montana's history occurred in 1983 when 2.8 million acres of cropland were idled under the U.S. Department of Agriculture's Payment-In-Kind Program and similar programs.

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[1]Agricultural Specialist with the U.S. Fish and Wildlife Service in Denver.

When I sum up the impacts of land use, water use, chemicals, and soil erosion, I must conclude that agriculture is having more impact on Montana wildlife than any other human endeavor.

Unfortunately, fish and wildlife agencies have not responded very well to this situation. The U.S. Fish and Wildlife Service, for example, devotes about 0.5 percent of its personnel to agricultural matters. Of all the papers in the Wildlife Society Bulletin and the Journal of Wildlife Management, only 5 percent deal with the production and maintenance of wildlife in agricultural ecosystems.

In spite of the neglect by our profession, some new agricultural technologies are developing which may, quite by chance, prove beneficial to farm wildlife. These new technologies are reduced tillage and high-tech organic farming.

First, let us consider reduced tillage. The purest form of reduced tillage is no-till or the planting of seed directly into the standing stubble left from the preceeding crop. Tillage is eliminated and weeds are controlled with herbicides. Reduced tillage decreases soil erosion dramatically, often by 95 percent (U.S. Department of Agriculture 1975).

In the case of wheat, reduced tillage results in a decrease in energy consumption (Smith and Fornstrom 1978) and it reduces labor requirements. Therefore, reduced tillage is very attractive to farmers.

Nationwide, 24 percent of all croplands are now farmed with some type of reduced tillage. Montana is lagging behind the Nation, having converted only 9.6 percent of its croplands to reduced tillage. Aside from the 1983 land set-aside program, the conversion to reduced tillage is the most important change in American agriculture in the last decade.

Nevertheless, only three studies have been completed on the impact of reduced tillage on wildlife (Cowan 1982; and Rodgers and Wooley 1983 <2 studies>). Many favorable claims are being made but few of these claims are backed by adequate data. In the Corn Belt and in the winter wheat region, we simply do not know what the net effect of reduced tillage will be on wildlife.

However, the situation is more promising in the spring wheat region which, regrettably, overlies our best duck producing region. This overlap is an unfortunate coincidence because spring wheat provides no nesting habitat. The ground is bare or is tilled during the spring.

With no-till, it is possible to convert from spring wheat to winter wheat, which is planted in the fall. The seed is planted directly into stubble without tillage. The wheat germinates in the fall and grows several inches before freeze-up. During the winter, the stubble traps an insulating blanket of snow which prevents winter kill.

In the spring, the ground is covered with stubble, with green wheat emerging through the stubble by late spring. No tillage occurs throughout the nesting season.

We suspect that winter wheat will not be the best duck nesting habitat, but there could be a lot of it. Montana has 6 million acres of land devoted to spring wheat culture (including duram wheat and fallowed acres) (U.S. Department of Agriculture 1983). Several economic and agronomic considerations will prevent conversion of all this acreage to no-till winter wheat. If only 25 percent was converted, 1.5 million acres of new nesting habitat would be created. The Northern Prairie Wildlife Research Center will initiate studies in North Dakota in the spring of 1984 to assess the value of this habitat.

The important change is not the conversion to no-till but the conversion to winter wheat. No-till is important only because it enables the conversion to winter wheat. The conversion to no-till spring wheat might actually be harmful to wildlife because it could result in massive nest destruction.

Organic farming and reduced tillage are often confused but the two systems are at opposite poles. Reduced tillage substitutes chemicals for tillage. Organic farming is defined as chemical-free farming. Organic farmers forego synthetic fertilizers and pesticides and provide fertility by including nitrogen-fixing legumes in crop rotations. Weeds and insects are controlled by rotating crops and by careful tillage.

Organic farming is the most overlooked conservation farming system in the nation. Research on small plots in Missouri (Miller and Krusekopf 1932; and Jamison et al. 1968) and in the field in Washington (Patten 1982) shows that organic farming rivals reduced tillage for soil conservation. Organic farming is even more energy efficient than reduced tillage (Lockeretz et al. 1976; Pimentel et al. 1983; Smith and Fornstrom 1978; Witmuss et al. 1975).

As with reduced tillage, we have only scant indications of the impact of organic farming on wildlife. Two studies in the Corn Belt revealed several times more breeding birds on organic farms than on adjacent conventional farms (Ducey et al. 1980; Gremaud and Dahlgren 1982). In the Wheat Belt, I believe the increased diversity and the inclusion of legumes in the crop rotation would increase both winter cover and nesting cover.

Currently, less than one percent of the cropland nationwide is farmed organically (U.S. Department of Agriculture 1980b) but interest is growing rapidly. The future of organic farming may be tied to the price of energy. If energy prices increase rapidly, as occurred in the early 1970's, all farmers will be forced to move toward organic technology as a means of economic survival.

Unfortunately, most wildlife managers perceive agricultural trends as givens--as uncontrollable forces to which we sometimes react but that we cannot control. In reality, agriculture may be the most manipulated industry in the U.S.A. Governments determine or effectively influence the number of acres planted and what is planted. Governments influence the sizes of the overseas market for grain, which chemicals may be used and how they are used, which acres are plowed and which are preserved in natural habitat. Governments influence the choice of soil conservation practices and the development of new production technology. The list goes on and on. Governments respond to the needs of people, including their need for wildlife if those needs are clearly and forcefully presented.

Even at the local level, there is a great deal we can do to influence agricultural trends. The U.S. Fish and Wildlife Service manages over 4000 acres of cropland in Montana. This land is broken into dozens of scattered parcels. Our goal is to turn these parcels into demonstrations of farming systems that are good for farmers and good for wildlife.

The Service also has requested money for the purchase of no-till equipment for use on our refuges and to rent to private farmers on demonstration bases.

Finally, we can influence agriculture through research. The Service has provided money to Montana State University for research on the use of a fungus, Sclerotina sp., for control of Canada thistle. The Service also funded several studies on organic farming at Iowa State University and a study of biological control of leafy spurge at North Dakota State University.

Nationwide, farm wildlife populations have declined with the intensification of agriculture. The major strategy of wildlife managers has been to

remove a few acres from crop production through land acquisition and to set these acres aside as wildlife refuges. Now, with organic farming and no-tilled winter wheat, we have the opportunity once again to produce both wildlife and crops on the same acres. Wildlife managers can set back and watch this happen and possibly watch it go awry. Or, managers can get involved, speed up the conversion process, and develop farming systems with maximum benefits for wildlife. The latter seems by far the more desirable.

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PRESERVATION OF WILDLIFE HABITAT, A COUNTY LAND USE PLANNING PERSPECTIVE

T. Mike Casey[1]

When I was first asked to address the Montana Wildlife Society on the efforts of the Rural Resource Development Council in Flathead County, I was concerned that such a talk at this time might be premature since we are only 3 months along on our program. We are, however, using a tool known as LESA (Land Evaluation and Site Assessment) which is a program that will soon become commonplace. Therefore, I felt that if nothing else, exposure to our use of LESA may be beneficial to you.

Flathead County is situated in the northwestern part of the state. Our initial study area is essentially the private non-corporate land holdings on the main Valley floor. The better soils of the county are sporadically distributed throughout that area. Much of the study area has undergone subdivision activity. The vast majority of this subdivision activity has been accomplished by using the occasional sale and family transfer subdivision exemption.

This type of activity lead the Flathead Conservation District to request county funding to develop a land use management program which will curb this type of activity while at the same time providing some windfall of speculative gain to the landowner. After the county granted funds for such an effort, the Rural Resource Development Council (RRDC) was set up. The Council is a 12-member board made up of a cross-section of interest and occupation from within the county.

LESA is a tool that was originated by the U.S. Soils Conservation Service in the wake of the 1981 Federal Farmland Preservation Policy Act. It was developed as a tool to assist local officials to make consistently objective decisions about the preservation of agricultural lands.

LESA is a two part process: Land Evaluation and Site Assessment. The Land Evaluation portion deals exclusively with soils properties. The Site Assessment portion deals with land use. The two parts each have a total maximum point value of 100 and 200 points, respectively.

Site Assessment should consider many different factors. The LESA handbook suggests the 16 following factors:

1. Percentage of area in agriculture
2. Percentage of land adjacent to site in agriculture
3. Percentage of land commercially farmed
4. Size of site
5. Zoning for site
6. Distance to urban area
7. Availability of ag. support system
8. Compatibility with comprehensive plan
9. Transportation
10. Availability of central sewage system
11. Soil suitability for on-site sewage disposal

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