



# **THE WILDLIFE SOCIETY MONTANA CHAPTER**

**Joint Meeting of the  
Northwest Section and the  
Montana Chapter**

## **THE WILDLIFE SOCIETY**

**March 9-12, 1994  
Kalispell, Montana**



**1994 ANNUAL MEETING OF THE MONTANA CHAPTER OF THE WILDLIFE SOCIETY,  
and, THE NORTHWEST SECTION OF THE WILDLIFE SOCIETY**

**9-12 March, 1994. Cavanaugh's, Kalispell, MT**

**Conference Theme: The Interface Between Wildlife Management and  
Land Management**

Montana Chapter, TWS:	President	Wayne Kasworm
	Past President	Gary Dusek
	Sec./Treasurer	Gary Hammond
	President Elect	Dennis Flath
Northwest Section, TWS:	President	Lynn Irby
	Past President	Chuck Blair
	Vice President	Gregory Green
	Sec./Treasurer	Jerome Hansen
	NW Sec. Rep.	Jim Peek

**CONFERENCE AGENDA**

**9 March, 1994**

**1:00 PM: Concurrent workshops:**

**Workshop A:** Negotiation and Mediating Skills for Environmental Issues. Led by Marc Scow, Montana Department of Administration. Ballroom A.

**Workshop B:** Preparation of Biological Assessments, and the Biological Opinion Process. Led by Bill Ruediger, USFS; and, Rob Hazlewood and Kevin Shelly, USFWS. Ballroom B.

**6:00 PM: Conference Mixer.** Get acquainted/re-acquainted with fellow TWS members. Food, beer and Frank Kuntz at the piano for your entertainment from 7:00-8:00 PM.

Visit the silent auction in the Big Sky Ballroom and bid on your favorite items. Proceeds support the Wynn Freeman Scholarship Fund.

**10 March, 1994**

8:30 AM: Conference Opening, Dennis Flath, President-Elect, Montana Chapter; and, Greg Green, Vice President, Northwest Section.

Session Chair: Greg Green

8:45 AM: KEYNOTE ADDRESS. Hal Salwasser, President, The Wildlife Society.

9:15 AM: THE INTERFACE BETWEEN WILDLIFE MANAGEMENT AND LAND MANAGEMENT. Pat Graham, Director, Montana Department of Fish, Wildlife and Parks, Helena MT.

9:45 AM: WILDLIFE CONSERVATION AND ECONOMIC MOTIVATION AS ALIEN FORCES. Jim Posewitz, Orion - The Hunters Institute, Helena, MT.

10:15 AM: Break. Sponsored by Montana Power Company.

10:45 AM: LAND USE PLANNING IN THE RURAL FRINGE: A CASE STUDY OF THE CANYON AREA OF FLATHEAD COUNTY, MONTANA. David M. Greer, Montana Planning consultants.

11:15 AM: BEFORE ECOSYSTEM WAS COOL. Jon Malcolm and Bill West, US Fish & Wildlife Service.

11:45 AM: Break. Lunch on your own.

Session Chair: Keith Aune

1:00 PM: SMALL MAMMAL DISTRIBUTION ACROSS MAJOR MONTANA VEGETATION TYPES. Kristi Allen and Tad Weaver, Montana State University; and, Dennis Flath, Montana Department of Fish, Wildlife and Parks.

1:20 PM: EFFECTS OF AZINPHOS-METHYL AND HABITAT ALTERATION ON A SMALL MAMMAL COMMUNITY IN FIELD ENCLOSURES. Eric Schaubert, W. Daniel Edge and Jerry O. Wolff, Oregon State University.

1:40 PM: AN EVALUATION OF 0.5% PERMETHRIN DUST FOR CONTROL OF FLEAS IN BLACK-TAILED PRAIRIE DOG BURROWS ON THE UL BEND NATIONAL WILDLIFE REFUGE. Craig J. Knowles and Pamela R. Knowles, FaunaWest; and, William Haglan, US Fish & Wildlife Service.

2:00 PM: THE MONTANA FOREST STEWARDSHIP PROGRAM: HABITAT MANAGEMENT ON MONTANA'S PRIVATE FOREST LANDS. Tom Butts, Helena, MT.

2:20 PM: SURVEYING MONTANANS' BELIEFS ABOUT WILDLIFE RELATED RECREATION. Scott A. McCollough, Dana E. Dolsen, Gary L. Dusek and John P. Weigand, Montana Department of Fish, Wildlife and Parks.

2:40 PM: PUBLIC ATTITUDES TOWARD MULE DEER IN AN URBAN ENVIRONMENT

IN EASTERN MONTANA. Duane Fritzen, Colstrip, MT.

3:00 PM: Break. Sponsored by Western Energy.

Session Chair: Kate Boula

3:30 PM: BIRD COMMUNITY RESPONSE TO ALTERNATIVE RIPARIAN GRAZING STRATEGIES. Todd Sanders and W. Daniel Edge, Oregon State University.

3:50 PM: EFFECTS OF NEST PREDATION ON GROUND-NESTING BIRD COMMUNITIES IN NORTHWESTERN MONTANA. William R. Swaney, Confederated Salish and Kootenai Tribes.

4:10 PM: LAND USE AND WILDFIRE EFFECTS ON LANDSCAPE PATTERNS AND AVIAN DIVERSITY: A COMPARISON OF THE GREATER YELLOWSTONE ECOSYSTEM AND THE PACIFIC NORTHWEST. A. Hansen, R. Patten, J. Rotella and J. Wilson, Montana State University; R. Redmond, University of Montana; and, W. Cohen and D. Wallin, Oregon State University.

4:30 PM: LAND STEWARDSHIP AND WILDLIFE MANAGEMENT ON MONTANA PRIVATE LANDS. Pat Gunderson and Steve Knapp, Montana Department of Fish, Wildlife and Parks.

6:00 PM: No Host Social Hour. Pre-Function area.

7:00 PM: Awards Banquet. Big Sky Ballroom. Master of Ceremonies: Wayne Kasworm, President, Montana Chapter, TWS. Banquet Speaker: Jack Horner, Curator of Paleontology, Museum of the Rockies.

## **11 March, 1994**

8:30 AM: Convene, announcements.

Session Chair: Jerome Hansen

8:40 AM: PERCEPTIONS OF WILDLIFE DAMAGE TO FORAGE CROPS ON LANDS CONTROLLED BY FARMERS AND RANCHERS IN MONTANA. Lynn R. Irby, John Saltiel, Walter E. Zidack and James B. Johnson, Montana State University.

9:00 AM: EVALUATION OF BIGHORN SHEEP IN THE TEN LAKES SCENIC AREA. Steven Johnsen and C.L. Marcum, University of Montana.

9:20 AM: EVALUATING IMPACTS OF HUMANS AND FOREST MANAGEMENT ACTIVITIES ON RECOLONIZING WOLVES IN NINEMILE, MONTANA. Michael Jimenez and Robert Ream, University of Montana.

9:40 AM: MANAGING WOLF-LIVESTOCK CONFLICT IN THE WEST. Carter Niemeyer, USDA/APHIS/ADC.

10:00 AM: CERVID-WOLF RELATIONSHIPS ALONG THE NORTH FORK OF THE FLATHEAD RIVER. Kyran E. Kunkel and Daniel H. Pletscher,

University of Montana.

10:20 AM: Break. Sponsored by the Confederated Salish and Kootenai Tribes.

Session Chair: Marilyn Wood

10:50 AM: SHEEP CARCASS AVAILABILITY AND USE BY BALD EAGLES IN THE SOUTH WILLAMETTE VALLEY, OREGON. W. Daniel Edge, N. Vern Marr and Robert G. Anthony, Oregon State University; and, Ray Valburg, Oregon Department of Fish and Wildlife.

11:10 AM: HEAVY METAL AND PESTICIDE CONTAMINATION OF BALD AND GOLDEN EAGLES IN THE WESTERN UNITED STATES. Alan R. Harmata, Montana State University.

11:30 AM: A NEST TERRITORY-BASED SURVEY METHODOLOGY FOR NORTHERN GOSHAWKS. Gregory A. Green, Enserch Environmental.

12:00 PM: Business Luncheon, Montana Chapter, The Wildlife Society.

2:30 PM: Break, reassemble.

2:40 PM: SCIENCE AND CONSERVATION BIOLOGY AT ZOOMONTANA. R.W. Torgerson and J.F. Kirkpatrick, ZooMontana.

3:00 PM: BEYOND BEEF - BACK TO BISON, AN ECOSYSTEM APPROACH TO RED MEAT PRODUCTION. Craig J. Knowles and Pamela R. Knowles, FaunaWest; and, Mike Fox, Fort Belknap Indian Community.

3:20 PM: PROTECTING MONTANA'S WETLANDS? A LOOK AT MONTANA'S 404 PROGRAM. Janet Ellis, Tim Baker and Lynn Tennefoss, Montana Audubon Council.

3:40 PM: DESIGNING A STATE WETLAND STRATEGY. Jeff Ryan, Montana Department of Health and Environmental Science.

4:00 PM: Conference Closing.

4:10 PM: Business Meeting, Northwest Section, The Wildlife Society.

## **12 March, 1994**

7:30 AM: Field trip to Big Mountain and vicinity. Leader: Nancy Warren. Return by noon.

Field trip to Flathead River floodplain, north shore of Flathead Lake and the Swan River Valley. Leader: Dick Mackie. Lunch included, return by 3:00 PM.

## LAND USE PLANNING IN THE RURAL FRINGE: A CASE STUDY OF THE CANYON AREA OF FLATHEAD COUNTY, MONTANA

David M. Greer, Montana Planning Consultants, P.O. Box 7607, Kalispell, MT 59904

*Abstract:* A land use plan was prepared for the "Canyon" area of Flathead County, Montana. The purpose of the planning effort was to establish a vision for the future use and development of the private lands situated in an area extending along the U.S. Highway 2 corridor between the community of Hungry Horse and Marias Pass. Portions of Glacier National Park and the lands of the Flathead National Forest were included in the planning area due to the vast land holdings of these two jurisdictions amongst and adjacent to the private lands. Future land use scenarios included consideration of habitat needs for various wildlife species, such as the grizzly bear. The plan is a product of a unique planning process that linked the interests of a local citizen's group to a broad-based support group comprised of federal, state, and local officials. Goals and objectives of the plan provide a balanced approach to the various private and public objectives within the Canyon area of Flathead County.

## BEFORE ECOSYSTEM WAS COOL. Cooperative Management in the Ninepipe Area

Jon Malcolm and Bill West, US FWS, National Bison Range

There has been an ecosystem approach to management of the National Bison Range Refuge Complex for over 7 years. The case of the Ninepipe National Wildlife Refuge, adjacent Ninepipe State Game Management Area, lands of the Confederated Salish and Kootenai Tribes, nearby Waterfowl Production Areas and an intermixing of surrounding private lands is an example. The Ninepipe area is situated on a terminal glacial moraine and includes a complex of natural wetlands as good as many of those found in the Prairie Pothole Region. This is a tremendous area for ground nesting birds including 17 species of ducks, Canada geese, Northern harriers, short-eared owls, western meadowlarks, ring-necked pheasants and gray partridge. The area has long been known as one of the better nesting areas for redhead ducks in the country, and recent research has documented some of the highest nesting densities of short-eared owls found anywhere in North America.

Predator management, weed management, wetland restorations and now conservation easements have focused on a block of land where resource values are high. Who owns the land has taken a back seat. The results have been very positive working relationships with private landowners and very successful predator, weed and wetland programs.

## SMALL MAMMAL DISTRIBUTION ACROSS MAJOR MONTANA VEGETATION TYPES

Kristi Allen and Tad Weaver, Montana State University,  
and,  
Dennis L. Flath, MT Department of Fish, Wildlife and Parks,  
Bozeman, MT

Small mammals were trapped with three trap types in grasslands (5 types), shrublands (5 types), forests (7 types), alpine (1 types) and riparian (2 types). All three trap types were necessary since different species were captured by pitfall, snap and live traps. While deer mice varied surprisingly little over community types, voles, shrews and chipmunks tended to be most common in structurally complex vegetation. These observations will be expanded. The relationship of animal presence to potentially predictive factors will also be examined.

## EFFECTS OF AZINPHOS-METHYL AND HABITAT ALTERATION ON A SMALL MAMMAL COMMUNITY IN FIELD ENCLOSURES

Eric Schaubert, W. Daniel Edge and Jerry O. Wolff, Oregon State University, Corvallis, OR

We exposed gray-tailed voles (Microtus canicaudus), deer mice (Peromyscus maniculatus) and wild house mice (Mus musculus) to 0, 0.85, and 3.38 kg/ha of the organophosphate pesticide azinphos-methyl (trade name Guthion) in 12 mowed and 12 unmowed, 0.2-ha alfalfa plots enclosed by metal fences. We monitored population densities, weight changes, and reproductive rates by live-trapping from April to August 1993. We report reduced capture probabilities and population densities of voles in mowed plots after mowing and reduced population densities and recruitment of voles after exposure to 3.38 kg/ha Guthion in both mowed and unmowed plots. Neither mowing nor pesticide application produced any demonstrable effects on deer mouse or house mouse populations.

AN EVALUATION OF 0.5% PERMETHRIN DUST FOR CONTROL  
OF FLEAS IN BLACK-TAILED PRAIRIE DOG BURROWS  
ON THE UL BEND NATIONAL WILDLIFE REFUGE

Craig J. and Pamela R. Knowles  
FaunaWest Wildlife Consultants  
P.O. Box 113  
Boulder, MT 59632

William Haglan  
Charles M. Russell National Wildlife Refuge  
P.O. Box 110  
Lewistown, MT 59547

**Abstract:** The UL Bend National Wildlife Refuge and Bureau of Land Management lands north of the Refuge in north-central Montana were selected as a reintroduction site for black-footed ferrets (*Mustela nigripes*) in 1993. Sylvatic plague (*Yersinia pestis*) was verified in black-tailed prairie dog colonies (*Cynomys ludovicianus*) in this area during 1992 and resulted in about a 50% loss in prairie dog acreage. By 1993, 3 of the 5 proposed release sites had been decimated by plague. Prairie dog burrows at the two remaining release sites were dusted during June 1993 with 0.5% permethrin dust to control fleas. A total of 830 ha in 16 prairie dog colonies were dusted. The permethrin was injected into burrows with PD-5 dusters at a rate of 7-9 g per burrow. Flea counts were made by flagging 100 prairie dog burrows pre- and post-treatment at treated and non-treated colonies to evaluate the efficacy of 0.5% permethrin dust for control of fleas. A significant decrease in flea counts was noted in the treated colonies while flea counts in the non-treated colony did not change significantly. Effects of dusting on other arthropods is discussed. The reintroduction effort was subsequently postponed due to widespread reproductive failure at black-footed ferret breeding facilities.



## THE MONTANA FOREST STEWARDSHIP PROGRAM: Habitat Management of Montana's Private Forest Lands.

Tom Butts, Helena, MT

The Forest Stewardship Program was begun in Montana in 1991. It's goal is to help private forest landowners in Montana develop a Forest Stewardship Plan for their property that includes a statement of goals for the property and a plan for how to achieve these goals. So far, more than 700 Montana landowners representing 225,000 acres, have attended the courses in 24 communities across the state. Courses are taught by 4 certified Stewardship Advisors, professionals from state and federal agencies, private firms, and private consultants, representing diverse disciplines including forestry, wildlife biology, range management, soil science, botany, and others. New programs being developed include a course on riparian area management and a certification course for loggers.

## SURVEYING MONTANANS' BELIEFS ABOUT WILDLIFE-RELATED RECREATION

Scott A. McCollough, Dana E. Dolsen, Gary L. Dusek,  
and John P. Weigand

Montana Department of Fish, Wildlife and Parks  
MDFWP Building, MSU Campus, Bozeman, MT 59717

Wildlife management agencies typically use public meetings and license-holder surveys to obtain public comments. These techniques are effective in gathering input from hunters, trappers, major landowners, and wildlife organizations but may preclude feedback from others. Given the interest in wildlife issues throughout Montana, the Department of Fish, Wildlife and Parks (DFWP) designed a survey to sample all Montanans' beliefs about wildlife-related recreation. DFWP began this survey by using focus groups to develop "belief statements". Interviewers then phoned 519 randomly-selected Montanans, read these statements and associated questions, and noted responses. Respondents generally showed a high level of interest in wildlife viewing and strong support for hunting. They exhibited less interest in and support for trapping. Our presentation quantifies the responses and discusses other results. Survey results will be used to assist in developing management strategies and to describe the environment in an environmental impact statement on DFWP's Wildlife Program (in prep).

# PUBLIC ATTITUDES TOWARD MULE DEER IN AN URBAN ENVIRONMENT IN EASTERN MONTANA

Duane Fritzen, Colstrip, MT

As part of a broad study to develop management strategies for mule deer (*Odocoileus hemionus*) inhabiting strip mine reclamation and urban habitats in the vicinity of Colstrip, Montana, an effort was made to document, via mail survey, public attitudes toward deer inhabiting the urban area. Deer-human conflicts in Colstrip have increased during recent years as an increasing number of deer have utilized forage resources, including shrubs and gardens, in the city. Results indicate that although deer are causing significant problems in Colstrip, tolerance of deer within the city is quite high. Additionally, although support for increased harvest of deer in the area is very high, attitudes regarding hunting practices suggest that hunter harvest may not be a practical management alternative. Successful implementation of wildlife management strategies requires public support. Documentation of public attitudes toward mule deer in Colstrip proved useful for assessing (1) the scope of the urban deer problem, (2) the feasibility of hunter harvest as a means of reducing deer-human conflicts, and (3) the need for public education programs to gain support for alternative management strategies.

## BIRD COMMUNITY RESPONSE TO ALTERNATIVE RIPARIAN GRAZING STRATEGIES

TODD SANDERS, *Department of Fisheries and Wildlife, Oregon State University, Corvallis,  
OR 97331-3803*

W. DANIEL EDGE, *Department of Fisheries and Wildlife, Oregon State University,  
Corvallis, OR 97331-3803*

*Abstract:* Despite the perceived ecological value of riparian zones in providing important habitat to breeding birds and domestic livestock production in the semiarid western United States, there is little empirical data published on the effects of various livestock grazing strategies on riparian habitats and avian communities. We compared breeding bird abundance, individual species' abundance, diversity, richness, and evenness, and vegetation composition and structure among summer season-long, summer shortduration and fall short-duration livestock grazing strategies in riparian habitats of Bear and Silvies Valleys in Grant County, Oregon in 1993. Documenting wildlife response to intermediate grazing strategies may identify management alternatives that are more sustainable from a wildlife habitat perspective, and may in turn permit more constructive coalitions between agricultural industry and environmental groups.

Presented by:

W. Daniel Edge

Department of Fisheries and Wildlife

Oregon State University, Nash 104

Corvallis, OR 97331-3803

Phone: (503) 737-1953

Fax: (503) 737-3590

E-mail: EDGEW@CCMAIL.ORST.EDU

EFFECTS OF NEST PREDATION ON GROUND-NESTING BIRD COMMUNITIES IN  
NORTHWESTERN MONTANA

William R. Swaney  
Confederated Salish and Kootenai Tribes  
P.O. Box 278  
Pablo, MT 59855  
(406) 675-2700

I studied 2 separate areas on the Flathead Indian Reservation in northwestern Montana to assess the effects of skunk removal on nongame ground-nesting bird communities. Skunk removal has taken place in the Ninepipe National Wildlife Refuge area since 1988, while no skunk removal has taken place in the Pablo National Wildlife Refuge area. These 2 areas were searched by nest-dragging selected areas, and all bird species found were monitored for hatching success. Both areas experienced fairly high rates of nest success, but sample sizes did not allow for statistical comparison between areas. Predation accounted for the majority of failed nests in both areas. Relative predator abundance, as indicated by scent station data, indicated that the skunk trapping program was effective in reducing the density of skunks in the Ninepipe area. Results of artificial nest transects in both areas indicated more predation in the Pablo area, but the results were only marginally significant. This study should be regarded as a baseline from which to further investigate ground-nesting bird communities in this area.

A. Hansen, R. Patten, J. Rotella, J. Wilson, Montana State University; R. Redmond, University of Montana; W. Cohen, D. Wallin; Oregon State University. Land use and wildfire effects on landscape patterns and avian diversity: A comparison of the Greater Yellowstone Ecosystem and the Pacific Northwest.

A key challenge to ecosystem management is understanding the effects of natural disturbance and land use practices on landscape patterns and biodiversity at regional and larger scales. Traditional ground-based inventories of these patterns are insufficient, and satellite data may offer the only practical tool for characterizing regional landscape patterns. We have initiated a study using satellite data to quantify landscape and bird habitat patterns in the Greater Yellowstone Ecosystem (GYE) and comparing land-use effects there with those in the Pacific Northwest (PNW). In both study areas, timber harvest has extensively altered landscape patterns with unknown effects on vertebrate diversity. The GYE also experienced broad-scale wildfires in 1988, allowing comparison of the effects of natural disturbance and timber harvest on landscape and biodiversity patterns. The study objectives are to: map vegetation across the Yellowstone Study Area using Landsat-TM data; use these maps to quantify the effects of logging, wildfire, and edaphic controls on landscape pattern; compare land use and landscape dynamics between the GYE and the PNW; and project the effects of these landscape changes on bird habitat diversity. In this paper, we will describe that background, methods, and current status of the work.



Land Stewardship and Wildlife Management on Montana Private Lands  
Steve Knapp and Pat Gunderson

The Wildlife Division of Montana Department of Fish, Wildlife and Parks evolved as and remains Montanas' wildlife management entity. Since the beginning, Department wildlife biologists have spent the majority of their time and effort documenting and managing the wildlife species of the state. As part of this species management, the habitat of these species has obviously been or should have been of major concern. Prior to the late 1980's, Department land programs had historically been centered on land acquisition for elk and waterfowl. Since then, several other land management programs were provided to the Department through legislative action. The first use of these new programs began in Region 7. After experiencing rapid land closures to hunting, biologists embarked into programs that would provide partnerships with private landowners for both the short and long term. Region 7 successfully implemented block management programs throughout the region. Then in 1988, the Department purchased the Brewer Ranch near Powderville in anticipation of trading the title back to private landowners for easements on their properties. This concept may have been looked upon with some reservation, but in 1994 the vision became reality. The Department traded fee title of the Brewer Ranch to the owners of the Page-Whitham Ranch near Glasgow. Perpetual easements now exist on both ranches. The major easement covenants include no sagebrush manipulation, no sodbusting, restrictions to follow a specific rest-rotation grazing system, guaranteed hunter access, and no subdivision. It appears that the Department, through its' lands program, now has the tools to actually practice game management. As Leopold (1932) defined it, "Game management is the art of making land produce sustained annual crops of wild game for recreational use". Although the department now has the authority to use these programs, it appears that the window of opportunity for implementing them is closing. Montana lands are no longer sought only for their income values. Land is rapidly being purchased and closed to the public for privately enjoyed aesthetic and recreation values. Private land managers will continue to be the necessary catalyst in accomplishing significant wildlife management throughout Montana.

## PERCEPTIONS OF WILDLIFE DAMAGE TO FORAGE CROPS ON LANDS CONTROLLED BY FARMERS AND RANCHERS IN MONTANA

Lynn R. Irby, John Saltiel, Walter E. Zidack, and James B. Johnson, Montana State University, Bozeman, MT

We attempted to determine the perceived damage to forage crops in Montana by wild ungulates using a mail survey of 2,200 randomly selected farms and ranches. The 1120 respondents indicated that wild ungulates were present on 97% of the agricultural operations in Montana. White-tailed deer (Odocoileus virginianus) were the most widespread ungulates and were most frequently cited as responsible for damage to forage crops by those respondents who reported damage. Damage to forage crops was most frequently reported in southwestern Montana and from agricultural operations with gross annual sales >\$200,000. We calculated the aggregate perceived damage to forage crops by wild ungulates in Montana during 1992 as \$12.2 million.

## EVALUATION OF BIGHORN SHEEP IN THE TEN LAKES SCENIC AREA

Steven Johnsen and C. L. Marcum, University of Montana, Missoula, MT

Demographic characteristics and distribution and movements of the Phillipps Creek herd of bighorn sheep (Ovis canadensis canadensis) were investigated during July through September 1991 and all of 1992. The most conservative population estimate for December 1992 was 82 (0.95 C.I. =  $49 \leq X \leq 106$ ). Lamb:ewe ratio for June 1992 was 90:100 and declined to 47:100 by December. The herd spent winter, spring and the rutting period in British Columbia. Their spring range was an enlarged winter range. Rutting occurred on the winter range. Two lambing-nursery areas were located in Montana, 17 and 24 km south of the winter/spring range. Mixed groups (ewes, lambs, young rams) used areas both north and south of the International Border, during summer/fall. During this same period, ram groups were most often observed south of the Border.

EVALUATING IMPACTS OF HUMANS AND FOREST MANAGEMENT ACTIVITIES ON  
RECOLONIZING WOLVES IN NINEMILE, MONTANA

Michael Jimenez, School of Forestry, University of Montana,  
Missoula, MT. 59802.

Robert Ream, School of Forestry, University of Montana, Missoula,  
MT. 59802.

We propose to study how humans have affected a recolonizing wolf (Canis lupus) population in a ranching community in Ninemile, Montana. Four major objectives will be addressed: 1) Determine impacts of humans and forest management activities on habitat selection by wolves, 2) Assess impacts of humans and forest management activities on wolf feeding habits, 3) Document annual population dynamics of wolves, 4) Determine wolf movements and use or avoidance of forest roads. Radio-collared wolves will be intensively tracked and monitored in order to estimate and analyse home ranges and critical habitat used by wolves. Seasonal wolf feeding habits will be determined by locating wolf kills, examining prey remains at kill sites, and by scat analysis. Kill site characteristics will be mapped using GIS methods and analysed by discriminant function analysis. U.S. Forest Service grazing allotments will be mapped using GIS techniques. Cattle will be radio-collared to estimate cow home ranges within allotments and will be overlaid on to wolf home ranges using GIS. Wolf population estimates will be determined by track counts, direct sightings, and aerial observations. Road densities in Ninemile will be calculated using Forest Service data and GIS mapping techniques. Traffic counters will be set up in several strategic locations throughout the valley in order to quantify vehicle traffic. The frequency of wolf locations on or near roads will be compared to traffic intensity on these roads to determine how vehicle traffic affects wolves' use of roads.

This study will provide insights on how humans have affected recolonizing wolves. Information from this research will help forest and wildlife managers make management decisions regarding federally protected wolves.

## MANAGING WOLF-LIVESTOCK CONFLICT IN THE WEST

Carter Niemyer, USDA/APHIS/ADC, East Helena, MT

By 1930, wolves were extirpated from the western United States for livestock protection. In 1973, the Endangered Species Act protected wolves, and by 1980, wolf recolonization began in Montana. Confirmed livestock losses have been 17 cattle and 12 sheep with 16 wolves controlled as part of a program to enhance the recovery of non-offending wolves. ADC has: 1) controlled problem wolves, 2) improved communication with affected publics and governmental agencies and 3) enhanced wolf recovery in Montana.

## CERVID-WOLF RELATIONSHIPS ALONG THE NORTH FORK OF THE FLATHEAD RIVER

Kyran E. Kunkel and Daniel H. Pletscher, University of Montana.

We began a study of the interactions between wolves (Canis lupus) and their prey in the North Fork of the Flathead Valley in northwestern Montana and southeastern British Columbia in summer, 1992. This study integrates and expands on work begun by the Wolf Ecology Project (University of Montana) and 3 masters' degree studies on deer, elk, and moose (University of Montana). Four wolf packs have occupied the study area; at least 21 and 22 pups were produced in 1992 and 1993, respectively. Survival rates and population trends of white-tailed deer (Odocoileus virginianus), elk (Cervus elaphus), and moose (Alces alces) were examined, and characteristics of prey selection by wolves were documented. Wolves, lions (Felis concolor), humans, grizzly (Ursus arctos) and black bears (Ursus americanus), and coyotes (Canis latrans) all killed radio-tagged ungulates to varying degrees. Survival rates were 0.74, 0.77, and 0.90 for deer, elk, and moose respectively. Deer and elk populations appear to be stable or declining based on population trend data. Wolves selected white-tailed deer as their primary prey item. Wolves traveled in areas of relatively high deer density and killed deer in areas of greater deer density than was found at random along their travel routes. There was no difference between deer density where deer were killed by wolves and control sites located 500 m from killsites. Wolves killed deer in areas of greater hiding cover than was available at control sites. There was no difference in snow depth or canopy cover at killsites and control sites. Wolves and lions killed their ungulate prey at sites that were similar in hiding cover and canopy cover.

## **SHEEP CARCASS AVAILABILITY AND USE BY BALD EAGLES IN THE SOUTH WILLAMETTE VALLEY, OREGON**

W. DANIEL EDGE, *Department of Fisheries and Wildlife, Oregon State  
University, Corvallis, OR 97331-3803*

N. VERN MARR, *U.S. Fish and Wildlife Service, Oregon Cooperative Wildlife  
Research Unit, Oregon State University, Corvallis, OR 97331-3803*

ROBERT G. ANTHONY, *U.S. Fish and Wildlife Service, Oregon Cooperative  
Wildlife Research Unit, Oregon State University, Nash 104, Corvallis, OR  
97331-3803*

RAY VALBURG, *Oregon Department of Fish and Wildlife, 7118 NE Vandenberg  
Avenue, Corvallis, OR 97331*

*Abstract:* We studied bald eagle use and availability of sheep carcasses in the Willamette Valley, Oregon, during winter 1990. We documented eagle numbers weekly with coordinated counts at known communal roosts, and determined availability of sheep carcasses every 2-4 days along a 65-km transect. Bald eagle numbers ranged from 13 to 49 at 5 roosts, and subadults consistently outnumbered adults. We calculated persistence rates of 137 sheep carcasses and determined that carcasses <200 m from a road or house were rarely used by eagles and persisted longer than carcasses farther away. Intact sheep carcasses persisted longer than carcasses with flesh or viscera exposed when discovered. Eagles were feeding on sheep carcasses in 83% of feeding observations, and 87% of 234 bald eagle castings contained wool. However, we found no evidence of eagle predation on sheep. Availability of sheep carcasses appears to be a primary factor influencing eagle use of the valley in winter. Our estimate of available sheep carrion/day was more than sufficient to meet the needs of the eagles wintering in the valley. However, if eagle numbers continue to increase or if carrion becomes less available, eagles may leave the valley or begin to prey on lambs. We recommend that ranchers make carcasses available to eagles away from sources of human disturbance, rather burying them as is currently done.

Presented by:

W. Daniel Edge

Department of Fisheries and Wildlife

Oregon State University, Nash 104

Corvallis, OR 97331-3803

Phone: (503) 737-1953

Fax: (503) 737-3590

E-mail: EDGEW@CCMAIL.ORST.EDU



# HEAVY METAL AND PESTICIDE CONTAMINATION OF BALD AND GOLDEN EAGLES IN THE WESTERN UNITED STATES<sup>1</sup>

ALAN R. HARMATA, Biology Dept., Fish & Wildlife Program, Montana State University, Bozeman 59717

**Abstract:** Lead (Pb), selenium (Se), mercury (Hg), organochlorine compounds and plasma acetylcholinesterase (AChE) activity were analyzed in blood of 336 eagles; 252 bald eagles (*Haliaeetus leucocephalus*) and 84 golden eagles (*Aquila chrysaetos*) between March 1985 and February 1992. Sample sizes, detection rates and concentrations [hereafter referred to as level(s)] for all metals varied among species, age/gender class, season and area. Pb was detected most frequently (95%) in bald eagles during winter and at elevated levels (0.39 ppm wet weight), followed by migrants (82%, 0.18 ppm), breeding adults (46%, 0.06 ppm) and nestlings (34%, 0.05 ppm). Pb was detected in 80% of golden eagles tested (84% of vernal migrants, 38% of nestlings) and at moderate levels (0.16 ppm). Blood Pb level was significantly higher in golden eagles than bald eagles. Age was positively and significantly correlated with Pb level in both species. Sources of Pb in both species were most likely waterfowl contaminated with Pb shot but possibly ground squirrels (*Spermophilus spp.*) contaminated by roadside vegetation in spring. Se levels were highest in breeding adult bald eagles (2.44 ppm) followed by nestlings (1.02 ppm), wintering birds (0.85 ppm) and migrants (0.59 ppm). Golden eagle Se levels were significantly lower than bald eagles (0.86 ppm) overall. Se in both species may reflect use of aquatically associated prey and also upland prey affected by saline seep. Hg levels were highest in breeding bald eagles (2.16 ppm) followed by migrants (0.48 ppm), wintering eagles (0.30 ppm) and nestlings (0.21 ppm). Hg levels and detection rates in golden eagles were low, <0.1 ppm and 24%, respectively. Age was significantly correlated with Hg in bald eagles but not golden eagles. Fish was most likely source of Hg in eagles. DDE was detected in plasma of 41% of bald eagles tested, 100% of eagles wintering in southern California, 38% of migrants and 20% of nestlings but all at very low levels. DDE was detected in 57% of golden eagles tested, 30% of nestlings and 60% of vernal migrants at very low levels. DDE levels were correlated with age in female golden eagles. Detection of DDD in 11% of golden eagles suggests more recent contamination than bald eagles. Mean AChE activity varied by age class in both species and season in bald eagles. Mean AChE activity (mU/ml) was 183.3, 175.46 and 244.86 in nestling, immature and adult bald eagles, respectively. Mean AChE activity was 288.98, 499.9 and 494.93 in nestling, immature and adult golden eagles, respectively. Up to 39% of non-nestling bald eagles and 35% of vernal migrant golden eagles had AChE activity  $\geq$  20% below sample means and may indicate sublethal exposure to anticholinergic pesticides. AChE activity was correlated with DDE and Hg in total sample of both species, but heavy metal and organochlorine relationships with AChE varied among age/gender/residency classes. Se was always negatively correlated with AChE in bald eagles suggesting a compensatory mechanism. Despite fairly pervasive incidence of detection and occasional high levels of toxic contaminants, populations from which both species originated are stable or increasing.

## A NEST TERRITORY-BASED SURVEY METHODOLOGY FOR NORTHERN GOSHAWKS

Gregory A. Green

Enserch Environmental, 10900 NE 8th Street, Bellevue, WA 98004

Protocols for surveying northern goshawks have been developed for use in the Southwest, Pacific Northwest, and Alaska, all of which are based on procedures developed by Kennedy and Stahlecker in Arizona. While these protocols are complete in respect to standardizing definitions, equipment needs, documentation, and determining presence or absence of goshawks, project coverage methodologies were clearly developed for surveying within the boundaries of areal (polygonal) feature projects such as proposed timber sales, harvest units, or forest stands, and are presently deficient in addressing the special needs for linear feature projects such as pipelines, transmission lines, or roads. Because linear projects crossing a nesting territory impact only a narrow (generally 50-100 feet wide) corridor of nesting habitat, limiting a calling survey to the proposed corridor only can result in as high as a 75% chance of missing detecting the nesting pair (because of incomplete survey coverage of the entire nesting territory). Similarly, limiting survey coverage to within the boundaries of a harvest unit can result in missed detection of a nesting pair where part of the nesting territory occurs within the proposed harvest unit, but the currently used nest is well outside the unit. In this paper I demonstrate the need to survey for nesting goshawks to at least 400 m outside of a project boundary where potential nesting habitat extends outside the boundary, especially for linear feature projects. I also examine three different survey patterns for effectiveness in cost and survey coverage of a hypothetical nesting territory.

## SCIENCE AND CONSERVATION BIOLOGY AT ZOOMONTANA

R. W. Torgerson, DVM, MPVM, Director, ZooMontana, 2100 S. Shiloh Road, Billings, MT 59108

J. F. Kirkpatrick, Ph.D., Director of Science and Conservation Biology, ZooMontana, 2100 So. Shiloh Road, Billings, MT 59108

**Abstract:** ZooMontana is North America's newest zoo and the only regional zoological garden in Montana and Wyoming. Emphasis will be upon rare and endangered species from temperate zones, and existing or planned major exhibits include the river otter, the Siberian tiger, the Japanese macaque, grizzly bear, bactrian camel, Przewalski's horse, lesser panda, snow leopard, black-footed ferret, and a variety of other species of mammals, birds, amphibians, and reptiles from around the world. The major mission of ZooMontana, a private non-profit institution, is education and conservation biology. At the current time ZooMontana has two operational projects in wildlife conservation biology and a master plan for an expanded program will be completed by June 1994. The initial active project is research directed at immunocontraception of captive exotic mammals, in order to reduce surplus animal production in zoos. Thus far, the contraceptive vaccine has been successfully tested in free-roaming wild horses, feral donkeys, white-tailed deer, and 12 species of captive exotic species, including members of Cervidae, Capridae, and Felidae, among others. The vaccine is being tested in 27 additional zoo species, but results are not yet available. The second active project is reproductive assessment in free-roaming and captive exotic mammals by means of urinary and fecal steroid analysis. The focus of this project is determination of ovulation, diagnosis of pregnancy, determination of fetal loss rates and neonatal mortality in free-roaming deer, elk, bison, wild horses, and a variety of intractable zoo species, without the need for capture, through the assessment of reproductive hormones in urine and/or feces. This project is a joint effort between ZooMontana and Deaconess Research Institute, in Billings. In September 1994, ZooMontana will initiate two more projects, including a conservation biology lecture program, and a small grant program to stimulate conservation biology research in the region. Projected future projects include on-site propagation efforts with endangered species in the zoo collection, off-site conservation biology projects related to regional rare/endangered plants and animals, the development of on-site laboratory research facilities, and both on-site and outreach education programs.

## BEYOND BEEF - BACK TO BISON

### AN ECOSYSTEM APPROACH TO RED MEAT PRODUCTION

Craig J. and Pamela R. Knowles  
FaunaWest Wildlife Consultants  
P.O. Box 113  
Boulder, MT 59632

Mike Fox  
Dept. of Natural Resources  
Fort Belknap Indian Community  
RR 1 Box 66  
Harlem, MT 59526

**Abstract:** Historical notes indicate that bison (*Bison bison*) were abundant in Montana east of the Continental Divide during the early 1800s but were largely extirpated from this area by 1885. Loss of this wildlife resource was a result of ecological sabotage orchestrated by the U.S. Congress, the War Department, and the Department of Interior to subdue Plains Indian tribes. Bison were not eliminated for any specific biological reason. In fact, an ecological comparison of bison to cattle reveals that bison are a vastly superior animal in all respects as a primary range herbivore. Bison are more mobile, have higher digestion efficiency on native vegetation, have lower water requirements, and are more cold hardy than domestic cattle. Most range management problems associated with behavioral traits of cattle can be effectively eliminated in the prairie environment by grazing bison. Recent discussion of range management reform by the Department of Interior does not consider bison as an alternative to grazing domestic cattle. Recently, several Plains Indian Tribes have taken the initiative to return bison to Indian lands; forming the InterTribal Bison Cooperative (ITCB) in 1990 to coordinate this effort. The Fort Belknap Indian Reservation, home of the Assiniboiné and Gros Ventre tribes in north-central Montana, is a member of the ITCB and is engaged in a bison restoration effort. Traditionally, bison have cultural, religious, and economic significance to the Assiniboiné and Gros Ventre people and restoration of bison provides an opportunity to maintain these traditions. Lessons and principles learned from this restoration effort are discussed. Significantly, large pasture bison herds provide a means to more efficiently produce red meat without environmental degradation.

## PROTECTING MONTANA'S WETLANDS? A LOOK AT MONTANA'S 404 PROGRAM

Janet Ellis, Tim Baker and Lynn Tennefoss, Montana Audubon Council, Helena, MT

Protection and enhancement of Montana's remaining wetlands is a priority issue for the Montana Audubon Council (MAC). Because of this commitment, MAC recently researched and compiled a report on Montana's 404 program, a critical program for wetlands protection. Janet Ellis will discuss how the 404 program is specifically protecting wetlands in Montana. She will also discuss why 9 out of 1,756 Section 404 applications were denied during the study period, as well as some of the ways Congress is considering changing the 404 program.

## DESIGNING A STATE WETLAND STRATEGY

Jeff Ryan, MT Department of Health & Environmental Science, Helena, MT

The Nation has lost nearly half of the wetland acreage that existed in the lower 48 States prior to European settlement. The Nation's wetlands continue to be lost at a rate of hundreds of thousands of acres per year due to both human and natural processes. This continued loss occurs at great cost to society.

Wetlands in Montana are critical areas for irrigators, homeowners, recreationists and scientists, as well as for wildlife and aquatic plant communities. Less than 2% of the State is occupied by wetlands.

Montana still has approximately 73% of its original wetlands.

The Clinton Administration supports the interim goal of no overall net loss of the Nation's remaining wetlands, and the long-term goal of increasing the quality and quantity of the Nation's wetlands resource base.

A state wetlands strategy should coordinate and focus state efforts, and probably include a set of policies to achieve no net loss.

Achieving no net loss of wetlands will require a comprehensive and coordinated approach that identifies all the threats to the wetlands resource and deploys a broad array of measures to address them.

Policy goals can help to coordinate the governmental programs that affect wetlands--including floodplain regulation, water quality, fish and wildlife programs, and public works projects--using a wide variety of both regulatory and nonregulatory tools. Developing a wetlands strategy allows states to anticipate future trends in growth and to accommodate both wetlands protection and legitimate development needs.



## **DOWN THE DRAIN:**

### **THE CAUSE AND CONSEQUENCE OF THE GREAT FLOOD OF 1993**

Craig J. and Pamela R. Knowles  
FaunaWest Wildlife Consultants  
P.O. Box 113  
Boulder, MT 59632

One of the world's most extensive terrestrial ecosystems was the North American prairie biome. Today, this ecosystem has been extremely fragmented by human activity. Causes of this fragmentation are chiefly the elimination of native grasses to grow monocultures of cereal crops and the planting of tame grasses and forbs for pasture. Very little upland prairie remains outside of Federally controlled lands and much of this remaining prairie has been converted to (or invaded by) exotic grass species.

A visual inspection of former grassland sites during July 1993 in Montana, North Dakota, South Dakota, Minnesota, Wisconsin, and Illinois showed extreme soil erosion due to agricultural conversion of prairie grasslands to wheat, corn, and soybean production. Observations of water runoff on cultivated, tame grassland, and forested sites strongly suggest that the Great Flood of 1993 was due to degraded watersheds in the upper Midwest and Northern Plains.

Seventy percent of the grain produced in this region is used as livestock feed. Domestic cattle have high digestive efficiencies on grain and alfalfa but low digestive efficiencies on native grasses. Bison feeding on native rangeland have comparable digestive efficiencies as cattle fed grain and alfalfa. Bison offer the opportunity to produce comparable quantities of red meat without the environmental degradation, and huge fossil fuel expenditures needed to maintain the present agricultural regime. An example of a bison restoration effort is shown.





