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Northwest Section

December 1986 - Philip Schladweiler, Editor

President's Corner

There is an adage about "the best laid plans of mice and men....". And then there is Murphy's Law. Their combined workings on events since our 1986 meeting in Coos Bay Oregon has resulted in this being the first newsletter for 1986.

First, I am grateful to David DeCalesta and the Oregon Chapter for hosting the NW Section annual meeting at Coos Bay in March 1986. Abstracts of papers presented at this meeting are included in this newsletter.

A second major event occurred the following week. This was the retirement of Dick Mackie as Section representative, and installation of Lew Nelson as our new representative (see inside article).

My personal goal for this year was to, in fact, improve communications within the section. Subsequent events precluded attaining the goal this year, but the ideas will be passed on into 1987.

The 1987 annual meeting announcement appears within. I am especially enthusiastic about the theme that involves economic values of wildlife. This topic deserves symposium status, but the time frame does not fully permit this. We do, however, intend to publish the entire proceedings.

We have turned a corner in wildlife management, and Aldo Leopold's admonishment not to ignore the private landowner's role in producing wildlife, but rather to provide him with incentives to do so, is being thrust upon us. Game ranching and leasing of hunting privileges by guides, outfitters, and hunters are with us. Increasing numbers of landowners are demanding compensation for real or perceived crop damages by wildlife. The increased rate at which wildlife habitats are altered cannot be ignored. The current drastic slump in prices of petroleum and agricultural products is reflected in local economy's looking for alternatives in order to survive.

Fish and wildlife resources and the recreation they provide are not only a viable economic alternative, they may be the only such alternative in some areas. Professional wildlifers, especially those of us in the public sector, will be contacted and (continued on page 2)



Einarsen Award

The Arthur S. Einarsen Award was established in 1966 to recognize outstanding service to the wildlife profession by individuals residing in the area encompassed by the Northwest Section of the Wildlife Society. The nominating committee is convinced that there are worthy individuals in the section and want your nominations. Nominations benefit from supporting documentation so please call Fred Bunnell, Committee Chairman (604-228-5724) for more details if you have a deserving candidate in mind. If you write, the address is Dr. F.L. Bunnell, Faculty of Forestry, The University of British Columbia, Vancouver, B.C. V6T 1W5, Canada.

President's Corner Con't

will be on the line and the stakes will include multi-million dollar industries as well as the basic resources. We need lots of information in this discipline, and a sharing of experiences by those who are already involved in it. Our 1987 meeting should provide a forum for such an exchange.

Have a very enjoyable holiday season, and I hope to see you in Juneau, Alaska in 1987.

Northwest Section Annual Meeting

The scheduled rotation for meeting sites indicates that Alberta was in line for 1987, and Alaska for 1988. Because of some problems, however, this order has been reversed.

The 1987 meeting will be held in Juneau, Alaska on March 31, April 1 and 2. The preliminary format suggests that registration will be the morning of March 31, with technical sessions starting after lunch. Two full days of papers on the theme "Economic values of Fish and Wildlife Resources" will follow.

The topic is both pertinent to expanding our knowledge into the field of economics, as well as timely. We anticipate papers by economists, those involved in commercialization of fish and wildlife resources, the tourism-travel industry, and wildlife biologists working for public agencies. Several knowledgeable people in the field of economics have already committed papers to the meeting.

Apparently the new governor of Alaska is greatly interested in this topic, particularly because of the economic impact of low oil and gas prices. He will be one of the featured speakers. The Alaska chapters of The Wildlife Society and American Fisheries Society will join the NW Section in this meeting.

This is the first call for papers. We need a title, author(s), and abstract to be submitted as soon as possible, preferably by January 1. Program chairman is Michael Thomas, Game Division, Alaska Dept. of Fish and Game, P. O. Box 20, Douglas, AK 99824, (907) 465-4265.

Proceedings of this meeting will be published using the usual symposium format. Specific instructions will be in the next newsletter. Because there will be no symposium editor, however, authors are expected to present the final copy of their presentation to their session chairman no later than the time of presentation if they want it included in the published proceedings. The program agenda should appear in our next newsletter.

Nomination of Officers

It is time to elect new officers. In conformance with the Section's bylaws and rotational system, the following offices and areas of representation will be filled:

President - Idaho
Secretary-Treasurer - Idaho
Vice-President - Alberta

The Nomination Committee will work hard to select good candidates, but are soliciting your help. We want interested members who are willing to work hard. If you know of someone with these qualifications and would like to have them considered for one of these positions, contact Jay Gore no later than January 1. Jay can be reached at: U.S. Fish and Wildlife Service, 4620 Overland Road, Boise, Idaho, 83705, (208) 334-1806.

The next newsletter will contain biographical sketches of the candidates and instructions for voting. New officers will be announced at the annual meeting.

Discount Room Rates for Student Members

The Oregon Chapter has a practice of reserving, and paying for, several rooms for student members attending their annual meeting. Although 3 or more students are together in each room, this practice encourages these potential wildlifers to attend professional meetings.

At the 1986 meeting in Coos Bay the NW Section's Executive Board agreed to extend a similar offer to wildlife students who are NW Section members. Any student or group of students wishing to take advantage of this offer should contact the program chairman about room availability. Only 3-4 rooms will be available, so requests should be submitted early.

Treasurer's Report

Jack Lyon reports that we have a current balance of \$746.65 in our checking account. This represents the money available for operating expenses until the annual meeting.

We also have a Certificate of Deposit for \$7,315 that is earning 6.11% annual interest.

RIPARIAN ZONE ISSUES

Why Do Salmon Make Cowmen See Red?

Dan Guthrie, Dept. Fisheries & Wildlife,
Oregon St. University, Corvallis.

Many Columbia Basin cowmen regard salmon as environmental whistle blowers. This is a realistic, not paranoid, view. Environmentalists have called overgrazing the greatest threat to the integrity of salmon and trout streams in the West. Cattle trampling and cropping alongside streams may cause erosion, pollution, sedimentation, lowered water tables, and elevated water temperatures. Such degradation on public range land has been exposed with much fanfare. That land, say environmentalists, is required by law to be managed for multiple benefits. However, while satisfying their own needs, grazers reduce the ability of streamside to accommodate other users. Not only do fish and wildlife suffer, but also recreationists, and those dependent on watersheds for irrigation, navigation, hydropower, and drinking supplies. Despite this, the salmon remains most responsible for pressuring range managers to change their ways along streams. What's needed now are feasible ways of keeping cows away from streams. The Riparian Tax Incentive was not the answer. The Farm Bill's Conservation Reserve Program may be a boon to private operators on erodible land. Intensive management may reduce streamside damage on any land. Fencing-acknowledged as effective, but unpopular for several reasons-could gain wide acceptance because of demonstration projects now coming to maturity.

Treatment of Riparian Habitat Under Oregon's Forest Practices Act: Problem Identification and Proposed Solutions

Paul Ketcham, 1000 Friends of Oregon.

Conservationists have argued for years that Oregon's Forest Practices Rules failed to adequately protect riparian habitat, but little information was available to document problem areas. This presentation focuses on recently compiled information which documents deficiencies with the forestry rules and their on-the-ground implementation. This information indicates Class I and II streams are not receiving proper protection under the Forest Practices Act from either a fish or wildlife perspective. Oregon Department of Fish and Wildlife authority is limited to the issuance of recommendations which may or may not be sought or followed by land managers. Solutions to identified problems are also discussed. A survey of USFS, BLM, California, and Washington forest practices standards is presented as the basis for appropriate administrative rule changes.

Riparian Fencing - the Other Side of the Fence

Clint Gray, Rancher, Monument, OR.

Today's range managers are changing and/or are under pressure to change grazing systems. Riparian fencing schemes can solve complex problems on both sides of the fence. The problems being addressed are both economic and ecologic - fencing is the primary tool. Fencing and its relationship to all factors is a potential study discipline in itself. Individuals designing fencing schemes should consider themselves engineers. While engineering a fence, the following factors should be considered: management goals; resource potentials and limitations; economics; and ecological consequences.

Breeding Birds of Riparian Woodlots in Southeast Alaska

Lowell Suring, U.S. Forest Service, Ketchikan, AK.

The western hemlock-Sitka spruce forests of southeast Alaska are currently being managed for a variety of uses. Timber harvest practices substantially modify habitats available to wildlife. Data from previous southeast Alaska bird surveys suggest that riparian habitats support higher levels of species richness than similar upland habitats. General effects of timber harvest on birds within riparian communities were evaluated by sampling bird populations associated with old growth conifers and with a 24-year old red alder stand that regenerated following timber harvest. Sampling was accomplished during May and June 1985 using point counts. Species richness and diversity were similar between communities; the coefficient of species similarity was also high (i.e., 70%). Comparisons of abundance of individual species showed significant differences for only 9 of the 46 species tested.

MAMMALS

Movements, Core Areas, and Habitat Use of Migratory Roosevelt Elk - Olympic Mountains, WA

Gregory Schroer, Dept. Fisheries & Wildlife,
Oregon St. Univ., Corvallis.

Seasonal movements, home ranges, core areas, and habitat use patterns of migratory Roosevelt elk (*Cervus elaphus roosevelti*) were investigated using radio telemetry. Minimum daily movements and home range size were both largest during hunting season and smallest during summer. Elk preferred habitats with a mixture of meadows and coniferous trees in the summer and rutting season. Use of coniferous forests was less than expected on the basis of availability ($P < 0.05$). Core areas contained a higher proportion of preferred slopes and habitats than found in the total area of availability. Spring and winter core areas were primarily located on valley floors and lower

valley walls, areas of greatest human activity. Elk use of areas near roads and residences within winter core areas primarily occurred during late night and early morning hours ($P < 0.01$).

Resource Use by Unexploited, Sympatric Bobcats and Coyotes in Oregon

Gary W. Witmer, Argonne National Lab.

Unexploited populations of bobcats (*Felis rufus*) and coyotes (*Canis latrans*) were studied in southwestern Oregon in 1981-82. Radio telemetry was used to determine home ranges, activity, and habitat use patterns. Twenty-five prey items were identified in bobcat and coyote scats. Diets of the 2 species were similar (overlap values were greater than 0.92 for all seasons). Mountain beaver (*Aplodontia rufa*) remains occurred in over 70% of the scats of both species. Home ranges of radio-collared animals averaged 14 km² for male coyotes, 12 km² for female coyotes, 11 km² for 1 male bobcat and 2 km² for female bobcats. Bobcat and coyote home ranges overlapped in time as well as space. Radio-collared members of both species occasionally utilized the same clear-cut sites concurrently. Daily activity patterns of both species were nearly identical; open areas were used during nightly hunting activities and forested areas during the day. Coyotes used grassy, more open clearings whereas bobcats favored brushy sites.

Reproductive Ecology of Bobcats and Lynx in Western Montana

Scott M. Brainerd, Mont. Coop. Wildlife
Res. Unit, Missoula.

Reproductive ecology of western Montana bobcats (*Lynx rufus*) and lynx (*Lynx lynx*) was studied from 1982 through 1984. Corpora lutea counts indicated ovulation rates of 4.16 for bobcats and 4.28 for lynx. Mean corpora lutea counts were significantly lower for yearling (3.62) than adult (4.48) bobcats. Nearly 56% and 10% of ovulating yearling and adult bobcats, respectively, lacked placental scars. Yearlings of both species had significantly lower pregnancy rates than adults. Placental scar counts indicated average litter sizes of 2.69 for bobcats and 2.75 for lynx. Bobcat ovulation rates and litter sizes differed significantly between years, but were not significantly different from eastern Montana bobcats. Bobcats bred from mid-February through mid-April, with kittens born from early May through early July; three wild litters averaged 2.7 kittens. Den sites were in concealed microsites (caves, hollow logs, spaces between boulders, or abandoned mine shafts) in steep, rocky areas associated with Douglas-fir (*Pseudotsuga menziesii*). Past disturbance (mining, logging, etc.) did not appear to influence den site selection and dens were often located near active secondary roads. Kittens did not make movements > 2 km until about 8 weeks of age. Mean adult bobcat home ranges (male=111.4 km², female=61.5 km²) were similar to those of

lynx (male=122.0 km², female=43.1 km²). Mean home range of three juvenile female bobcats was 222.1 km². Dispersal of two juvenile bobcats and an adult lynx was documented.

The Influence of Viewing Angle on Elk Hiding Cover in Young Timber Stands

Jodie Canfield, Wildlife Biology Program, Univ. Montana, Missoula.

The influence of topography on elk hiding cover values was investigated. The hypothesis that hiding cover values in young timber stands decrease proportionately as the viewing angle increases from the horizontal was tested. Results confirmed that a young timber stand, providing 100 percent visual concealment across a horizontal plane, may provide 50 percent or less cover when viewed from an elevated angle. The higher the viewing angle, the greater the relative cover loss. In a simple linear model, viewing angle explained 52 percent of the variation in hiding cover values. Slightly more variation was accounted for when the data were stratified by tree height. On average, a 10 degree elevation in viewing angle decreased hiding cover by 10 percent. The cover loss relationship was most pronounced in stands with the steepest topography, shortest trees, and lowest tree and shrub densities. These results indicate that existing evaluation methods used on public lands may grossly overestimate elk hiding cover values. The relationship between hiding cover and viewing angle also has significant implications for timber harvest yields, elk management, and road management.

Of Beaver and Dams

Robin Bown, Mont. Coop. Wildlife Res. Unit, Missoula.

Hydroelectric dams provide a substantial portion of the West's energy. Major efforts are currently underway to mitigate losses to fish and wildlife from both existing and potential dams. Beaver (*Castor canadensis*) provide a good indicator for the success of such mitigation as they exist on most rivers, depend almost exclusively on riparian zones, and are fairly adaptable. Beaver were studied in central Montana on the Missouri River; Lake Elwell, a nearby reservoir on the Marias River; and the Marias River below the reservoir. Beaver activity on all areas was typically associated with riparian shrubs and tree development. However, placement of lodges varied between areas. Lodges on the Missouri River were correlated with mud banks of stable configuration. Marias River lodges were located on mud banks with relatively steep slopes and aspects between 50 and 150 degrees. Lodges on Lake Elwell were strongly associated with stable banks having aspects of 90 to 200 degrees, and deep water near shore. Dams alter riparian zones in many ways, both on the reservoir and downstream. Many of these changes affect the

beaver's food supply or ability to den. Preliminary ideas for on-site mitigation are discussed.

Mule Deer Use of Agricultural Lands Adjacent to Missouri River Breaks Habitat

Susan K. Kraft, Mont. Coop. Wildlife Res. Unit, Missoula.

Mule deer use of grainfields adjacent to river breaks was assessed using track transects, radio telemetry, and sighting data. Deer used fields from September to April, primarily at night. Feeding occurred more often in stubble strips than in new winter wheat, although the two field conditions occurred with equal frequency. Deer preferred areas <200 m, and avoided those >400 m, from rough terrain. High reproductive and fawn survival rates indicated that the population was in excellent nutritional condition. Nutritional benefits to mule deer associated with use of agricultural crops may have major effects on population dynamics that should be considered when developing management strategies.

Ungulate Zooarchaeology in Northeastern Oregon: A Review of the Evidence

Kenneth C. Reid, Center for NW Anthropology, Wash. St. Univ., Pullman.

Ungulate remains recovered from prehistoric cultural deposits in northeastern Oregon suggest that bison, pronghorn, and mountain goat were all present in areas outside the ranges proposed in Bailey's (1936) The Mammals and Life Zones of Oregon. On the other hand, the presumed horse irruption that began in the area after 1730 remains remarkably under-documented by hard evidence. Reporting problems in the zooarchaeology data are discussed, and natural processes that influence bone preservation over short and long periods of time are examined.

Interpreting Elk Census and Check Station Data in Western Montana

Sally J. Sovey, Mont. Coop. Wildlife Res. Unit, Missoula.

Twenty-eight years of elk (*Cervus elaphus*) hunter check station data and 20 years of spring elk counts in the Blackfoot drainage were compared to changes in hunting regulations. Spring aerial censuses indicated a threefold increase in elk numbers. While hunter effort in this period increased tenfold, the kill per unit effort declined, the cow kill declined, and the proportion of yearlings in the bull harvest increased, all suggesting lowered elk availability. However, changes in age and sex structure resulting from regulation changes giving added protection to the antlerless segment of the population explain these trends most simply. Recent data suggest increased population stability.

Winter and Spring Habitat Selection by White-tailed Deer in a Western Montana Second-Growth Forest

Kevin Berner, Mont. Coop. Wildlife Res. Unit, Missoula.

Winter and spring habitat selection were studied during and following two unusually snow free winters. Deer concentration areas were located the first winter. Collection of vegetation data, habitat type mapping, and establishment of pellet transect lines were done the following summer. Two potentially new community types were described. Pellet transects were read prior to and following the second winter. Four radio collared deer had home ranges that varied from 141-505 ha in winter, and 141-360 ha in spring. Deer appeared to prefer dense canopy classes, and used nonforested areas less than they were available except during spring nights. The only tree diameter class that seemed to attract deer was residual old growth. Deer use was high on areas with dense shrub cover <0.5 m tall. Deer did not appear to select for any crown diameter class, stands containing seedlings or saplings, or presence of shrubs >0.5 m tall. Moist habitat types were used more than they were available in all analyses. Radioed deer used uncut areas more than predicted. The PSME/SYAL/CARU habitat type was selected for in winter; PIPO series stands were selected for, and PSME/PHMA habitat types were avoided in both seasons. Pellet concentrations were higher on northerly than southerly slopes. Radioed deer selected slopes between 6-25%, while pellets were concentrated on slopes between 26 and 35%. Pellet deposition may be higher in bedding and travel areas, whereas radio locations may more accurately depict feeding areas.

Elk of Mount Rainier National Park: Home Range and Habitat Use

Kevin Cooper, Dept. Fisheries & Wildlife, Oregon St. Univ., Corvallis.

Increasing elk populations in the northeast corner of Mt. Rainier National Park prompted a study of whether this was a naturally occurring event or due to forest management practices on winter range outside the park. Cow elk in two subpopulations were radio collared and tracked to determine home range, migration routes, and habitat utilization. One subpopulation wintered in managed forests and preferred alder flats and 12-30 year old clearcuts interspersed with small openings. This herd moved to a spring staging ground where younger, more open, and wetter clearcuts were preferred. The other subpopulation spent winter and spring in 300 - 500 year old-growth forests near the Park boundary; valley bottom habitats were preferred. Both subpopulations summered in high (4000'-6000') cirques near treeline in Mt. Rainier National Park. Habitat preferences will be used to weight habitat values in forest management - elk response models.

BIRDS

Mate Fidelity, Site Tenacity, Sex Dimorphic Traits, and Productivity of Black Terns

Mark A. Stern, Dept. Fisheries & Wildlife, Oregon St. Univ., Corvallis.

A banded sample of 778 adult black terns nesting at Sycan Marsh, Oregon, was used to examine mate fidelity, site tenacity, survivorship, sex dimorphic traits, and productivity. Few black terns maintained pair bonds between breeding seasons, and there were no instances of mate swapping. Lack of mate fidelity may be best explained by low survivorship and/or dispersal to other breeding areas. Site tenacity, based on recaptures, was low compared to other larids; approximately 67% of recaptured birds nested within the same primary nesting area (PNA), often at the same colony site. The remaining 33% exhibited random dispersal to other PNA's. Males of mated pairs were always larger than females (total head length, culmen). Nest traps were more likely to catch males of a given pair first. Nest success and fledging rates did not differ among habitats of varying vegetative composition and water depth.

Nesting Ecology of Canada Geese on an Irrigation Reservoir

Sally J. Sovey, Mont. Coop. Wildlife Res. Unit, Missoula.

Canada goose (*Branta canadensis moffitti*) nesting ecology was studied on Ninepipe National Wildlife Refuge in response to concerns about declining productivity. Nest abandonment rates exceeded 20% in the early 1980's, far higher than elsewhere in the Flathead Valley. Suspected causes included intraspecific conflicts for nest sites, interspecific interactions with nesting gulls, and fluctuating water level. The abandonment rate declined to 11% (1984 and 1985 combined) after 40 new nesting sites were provided. Detailed behavioral observations indicated that social factors associated with crowding were the major cause of nest abandonment. Virtually no abandonment occurred on single-nest islands, but multiple-nest islands showed elevated rates of territorial interactions and abandonment. Most abandonment occurred early in the nesting cycle, and relatively low clutch size suggested that young geese may have been involved. Gulls, great blue herons, and double-crested cormorants had no detectable influence on nest abandonment by geese. Fluctuating water level was a major determinant of overall nest success. Once nests were established, rising water levels caused flooding, and falling levels exposed island nests to increased mammalian predation. Although common, ravens destroyed only one goose nest. This contrasts sharply with Flathead Lake, where ravens caused most nest failures. Few perches for ravens exist at Ninepipe, and open habitat increases the chance that geese will see and repel nest predators.

Some Management Implications of Canada Goose Brood Behavior

Les Eberhardt, Dept. Fisheries & Wildlife, Oregon St. Univ., Corvallis.

Movement and activity of radio-marked Great Basin Canada goose (*Branta canadensis moffitti*) broods were studied on the Columbia River in southeastern Washington. A grazed pasture was important rearing habitat for broods hatched in the immediate vicinity, but did not attract marked broods from >11 km. The importance of this pasture to broods was demonstrated by the significantly ($X^2=74.9$, $P,0.001$) higher feeding rates they exhibited while on the pasture than when in other habitats. Broods throughout the study area preferred to remain close to the shoreline; only 7% of 3,300 relocations of marked broods were >50 m from the waters edge. Human disturbance may have reduced pasture use by broods. Broods appeared most susceptible to disturbance during their first few weeks of life. Although broods were often split up during capture attempts, drive-trapping did not appear to have a substantial effect on the subsequent movements or integrity of radio-marked families once they were 6-10 weeks old. Management efforts which include providing mowed meadows or pastures as brood foraging areas would be most effective if the pastures were free from human disturbance, located near adequate nesting sites, and positioned to maximize the interface between pasture and water.

Avian and Arthropod Predation in Forest Insect Dynamics

Torolf R. Torgersen, U.S. Forest Service, LaGrande, OR.

Studies have documented 35 species of birds which prey on all stages of the western spruce budworm and Douglas-fir tussock moth. Insectivorous birds and canopy foraging ants share a numerically important role in the population dynamics of these two important forest insects. Selective enclosure experiments indicated that about 15 times as many budworm survive on trees from which birds and ants are excluded as on trees patrolled by these predators. Results of these studies have important forest management implications.

Home Range and Habitat Use of Pileated Woodpeckers, Western Oregon

Kim Mellen, Oregon Coop. Wildlife Res. Unit, Corvallis.

Radio telemetry was used to study breeding season home range and habitat use of pileated woodpeckers in the Coast Range of western Oregon. Home range size was calculated for 8 pileated woodpeckers using the minimum convex polygon method. Habitat use was determined for 14 birds. Habitat was divided into 13 classes. Habitat class availability was compared to percent of telemetry locations occurring in each habitat

class. Preference for habitat classes was determined using a chi-square goodness of fit test.

Colonial Waterbird Response to Recent High Water Levels in the Malheur-Harney-Lakes Basin in Southeast Oregon

Gary L. Ivey, U.S. Fish & Wildlife Service, Hines, OR.

Recent precipitation increases in the northern Great Basin have resulted in dramatic changes in colonial nesting species. Since 1981, Malheur Lake has increased in size from approximately 29,000 ha to over 70,000 ha, resulting in island development and rural homesite flooding. Islands, flooded trees around homesites, and flooded riparian habitat have increased the availability of nesting sites for most colonial nesting species. Caspian terns nested in 1983 and American white pelicans in 1985; neither had nested in the basin since 1960. Increases in average number of pairs between the 1966-81 and 1982-85 periods were: white-faced ibis, 127 to 913; great egret 253 to 605; snowy egret, 86 to 167; great blue heron, 174 to 456; black-crowned night-heron, 544 to 593; and double-crested cormorant 80-565. High water has clearly benefited most colonial nesting species, however, Franklin's gulls have declined.

Food Habits and Environmental Contaminants of Bald Eagles Nesting in Southcentral Oregon

Richard W. Frenzel, Oregon Coop. Wildlife Res. Unit, Corvallis.

Food habits and levels of organochlorine compounds and heavy metals in bald eagles and their prey were studied in three nesting areas. Food habits were assessed by examination of 2,025 prey items found at nests and observations of 16 radio equipped eagles. Contaminant levels in prey bases were determined by residue analyses of 232 pooled samples of potential prey items. Contaminant concentrations in bald eagles were determined by residue analyses of the contents of 13 addled eggs and blood samples from 8 adults, 3 sub-adults, and 82 nestlings. Eagle diets were highly diverse (84 prey species), changed seasonally, and differed markedly by geographic region. Eagles fed largely on fish during summer months; ducks and fish-eating birds increased in importance during fall and late winter. Most prey of resident eagles were taken live or pirated from osprey; scavenging comprised less than 20% of the observations. Contamination of most resident bald eagle prey was fairly low. However, DDE, PCB's, and mercury were consistently detected at moderate levels, indicating biomagnification in the food-chain. Fish-eating birds in the eagles' diet were apparently the source of elevated environmental contaminants in Upper Klamath Lake eagles. Shell thinning was greatest at Upper Klamath Lake nests, consistent with dietary, prey base residue, and

blood data. Contamination was below levels associated with critical population declines. However, concentrations of DDE in eagle blood and eggs indicated reduced reproductive success of specific nests.

Use of Snags by Cavity-Nesting Birds on Clearcuts

Barry Schreiber, Forest Science Dept., Oregon St. Univ., Corvallis.

The response of cavity-nesting birds to four levels of snag density was studied on young clearcuts in northwest Oregon. Cavity-nesting bird density was positively correlated ($r^2=0.61$) with increasing snag density. The large proportion (90%) of secondary cavity-nesters resulted in a stronger correlation ($r^2=0.86$) between numbers of snags with cavities and number of cavity-nesting birds. At the highest levels, cavity-nesters represented 30% of total bird species richness and density. Six species, hairy woodpecker (*Picoides villosus*), northern flicker (*Colaptes auratus*), western blue bird (*Sialia mexicana*), house wren (*Troglodytes aedon*), tree swallow (*Iridoprocne bicolor*), and violet-green swallow (*Tachycineta thalassina*) were frequently observed on clearcuts with snags. The bluebird and house-wren were previously described as "rare" forest-wide. Because this includes mature habitats containing snags, these two species may depend on snags in open seral stages.

The Great Gray Owl in South-Central Oregon

Terry Bryan, Wildlife Consultant, Bend, OR.

Distribution, abundance, and habitat of the great grey owl were studied in south central Oregon. Fifty-six individual or paired birds were found within the study area in 1984. Dominant habitat features at location sites were wet meadows in conjunction with lodgepole pine stands. A four-month study of nesting habitat in 1985 located eight nests: five on red-tail hawk nest platforms in ponderosa pine stands; 3 on goshawk nest platforms in lodgepole pine stands; and 1 in a snag in mixed-conifer. All nests were within one-half mile of wet meadows.

Dispersal of Juvenile Northern Spotted Owls

Gary S. Miller, Oregon Coop. Wildlife Res. Unit, Corvallis.

Dispersal of 48 radio marked juvenile northern spotted owls (*Strix occidentalis caurina*) was studied from 1982-1985 in western Oregon. Dispersal direction, distance, and survival are discussed.

LAW ENFORCEMENT

Phenotyping Phosphoglucose Isomerase in West Coast Cervids for Species Identification and Individualization

James Pex, Criminologist, Oregon State Police.

Phosphoglucose isomerase (PGI) from 111 Columbia and 21 Sitka blacktail deer, 65 mule deer, 100 moose, 46 elk, 75 caribou, 46 reindeer, and 2 whitetail deer was examined using cellulose acetate electrophoresis. Mule deer and Columbia blacktail deer exhibited a biallelic polymorphism at the PGI-1 locus. Allele frequencies were 0.18 and 0.82 for Columbia blacktail deer and 0.70 and 0.30 for mule deer. No PGI variation was present in other cervids examined, except for a single caribou variant. PGI phenotyping can be of value in individualizing meat from mule and blacktail deer for wildlife law enforcement. Comparison of PGI mobilities can also be used to differentiate between several of the monomorphic species, and can differentiate between beef and all cervids except elk.

Time of Death Estimation in Blacktail Deer by Temperature and Aqueous Humor Glucose

James Pex, Criminologist, Oregon State Police.

Aqueous humor glucose and body temperature are utilized to estimate the postmortem interval. Sequential sampling of a 15-deer control sample provided sufficient data to establish a 95% prediction interval for the first 8 h. A 187-deer field study showed 94.7% to be within the prediction interval.

Apples and Oranges

David deCalesta, Dept. Fisheries & Wildlife, Oregon St. Univ., Corvallis.

The required balance of management of multiple natural resources on public lands necessitated "trade-offs" in the past. Wilderness "set aside" areas for wildlife were traded for timber sales and clearcutting. However, no common trade-off currency existed: difficulty arose in comparing aesthetic "apples" of wildlife with pecuniary "oranges" of board feet of timber. Hence, viability of spotted owls populations was pitted against timber industry jobs. The experience of bagging a trophy elk was weighed against additional pounds of beef wrought from forage used by both. In critical situations, there were no trade-offs, the critical resource was managed at the expense of others. Where management flexibility exists, natural resources conflicts are becoming couched in a not-so-common denominator-money. The need for a means of making valid economic comparisons between management for wildlife and other natural resources is stronger than ever. Ignoring this need by stating that wildlife and other natural resources cannot be compared on economic grounds will doom priority of wildlife management to a status below that of other natural resources.

Northwest Section Representatives

Dick Mackie (Montana) handed over the duties of representing our Section on The Wildlife Society Council to Lew Nelson (Idaho) at the annual TWS meeting in Reno, Nevada in March 1986. Dick was presented with a plaque by TWS in recognition of his accomplishments.

The Section is grateful to Dick for his tremendously dedicated service during two 3-year terms. He emphasized professionalism at every level, and developed a fish and wildlife review program for Universities and Colleges. He spearheaded the movement to get the U.S. Fish and Wildlife Service to act on its grazing EIS for the C.M. Russell National Wildlife Refuge, Montana. Dick was also deeply involved in TWS' position statement on grizzly bears.

Dick maintains an active interest in a broad spectrum of issues such as certification and continuing education for professional wildlifers and pesticide-wildlife relationships.

Lew Nelson, who became our new Section representative in March, fills this position with enthusiasm and dedication. Lew needs to know about our concerns, and needs our support. He can be contacted at: Dept. of Fish and Wildlife, Univ. of Idaho, Moscow, ID 83843, (208) 885-7323 or (208) 883-3017 at home.

Meetings of Interest

Fourth Northern Furbearer Conference, 3-4 April 1987, Centennial Hall, Juneau, Alaska. Persons who plan to attend this conference and/or present a paper should contact: Steven R. Peterson, P.O. Box 3-2000, Juneau, Ak 99802, (907) 465-4190.

Animal Damage Management in Pacific Northwest Forests, 25-27 March 1987, Ridpath Hotel, Spokane, Washington. For Final Program and Registration Information contact: Conferences and Institutes, Washington State University, 208 Van Doren Hall, Pullman, WA 99164-5220, (509) 335-2946.