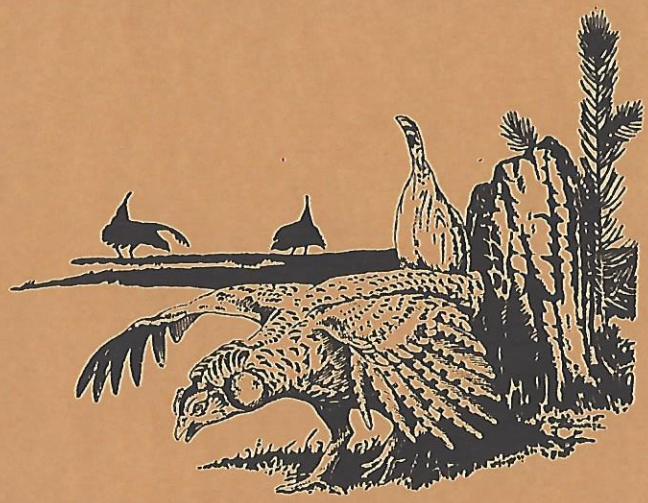
Abstracts



17th Prairie Grouse Technical Conference and "Prairie Chickens on the Sheyenne National Grasslands" Symposium

September 15-19, 1987
University of Minnesota-Crookston

PROCEEDINGS OF THE 17th CONFERENCE OF THE PRAIRIE GROUSE TECHNICAL COUNCIL

September 16-19, 1987

University of Minnesota, Crookston

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Sponsors

Northwest Agricultural Experiment Station and
Technical College of the University of Minnesota
U.S. Forest Service
Minnesota Department of Natural Resources
U.S. Fish and Wildlife Service
Minnesota Prairie Chicken Society
Minnesota Sharp-tailed Grouse Society

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Abstracts are presented as they were submitted by the authors and may contain tentative findings and recommendations. They are not for publication or reference without the consent of the authors.

FOREWORD

Every two years a loose knit group known as the Prairie Grouse Technical Council comes together to share research findings and ideas on the biology and conservation of prairie grouse. Meetings are held at different locations throughout the prairie grouse range so participants can gain a better understanding of how these birds live in different sets of environmental conditions. The setting of the Minnesota meeting was at the continental forest-prairie transition and also marks the northern range limits of greater prairie-chickens in North America. The sharp-tailed grouse are near the western edge of their Minnesota range near Crookston and ruffed grouse are found in nearby aspen groves to the east.

Nearly 100 attendees came from several states and Canadian provinces to hear 32 papers, take part in an all-day field trip, engage in the serious eating of moose steaks and barbequed game hens, and hear Pierre Bottineau talk of beaver pelts when the world was younger. A special symposium focused on the ecology of greater prairie-chicken at the Sheyenne National Grasslands. And bylaws were formally adopted to clarify the structure of the organization. It was a good meeting.

ACKNOWLEDGEMENTS

A meeting of this sort takes the assistance of many "background people" whose ideas and hard work make it happen. We thank the speakers for informative presentations and the abstracts provided here.

The planning committee consisted of Bill Berg, George Davis, Gordy Forester, Jerry Maertens, Rob Naplin, and Terry Wolfe of the Minnesota Department of Natural Resources; Jim Mattsson and Carl Madsen of the U.S. Fish and Wildlife Service; Jay Newell, manager of the Wetlands, Pines and Prairie Audubon Sanctuary; and Paul Anderson, president, Minnesota Prairie Chicken Society. Bill Berg, Rob Naplin, Jim Mattsson and Earl Johnson secured raffle prizes and coordinated that activity. Bill Berg and Gordy Forester acted as chief procurement officers in obtaining "special meats" and chef Madsen coordinated an excellent barbeque. Bill Fortune and Mike McNeill led the post-conference field trip at the Sheyenne National Grasslands.

A special thanks to Dr. Larry Smith, Superintendent, Northwest Agricultural Experiment Station, University of Minnesota, who encouraged and supported Svedarsky's involvement in chairing the Council and hosting the conference. Dr. Gary McVey, Chairman, Agriculture Division, University of Minnesota Technical College, also supported Svedarsky in this effort along with Chancellor Donald Sargeant. Tom Feiro, Natural Resources Department Technician, coordinated a multitude of details from airport pick-ups to refreshment deliveries. Jan Solheim; Northwest Agricultural Experiment Station and Shary Kennedy, Rocky Mountain Forest and Range Experiment Station, were in charge of registration. The following University of Minnesota staff helped with typing and publications: Jan Solheim; Maria Sommerfeld, Agriculture Division; and Sue Dwyer, Patti Tiedemann, and Linda Wilkens of Media Resources.

Our sincere thanks to all of the above.

Dan Svedarsky
University of Minnesota, Crookston
Ardell Bjugstad
U.S. Forest Service, Rapid City, SD

PROGRAM

Wednesday, 16 September, 1987

7:30 - Coffee and registration
Agricultural Research Center, University of Minnesota

8:30 - **"Welcome to northwest Minnesota"** - Larry Smith, Superintendent, Northwest Agricultural Experiment Station, University of Minnesota

8:40 - **"An overview of Minnesota's wildlife"** - Roger Holmes, Chief, Section of Wildlife, Minnesota Department of Natural Resources, St. Paul

9:00 - (1) **"Land use changes, fur prices, and prairie-chicken populations in Polk County, Minnesota"** - Dan Svedarsky, University of Minnesota; and Terry Wolfe, Minnesota Department of Natural Resources

9:40 - Refreshment break

10:00 - (2) **"Bog chickens - greater prairie-chickens on the sedge meadows in Hubbard County, Minnesota"** - Rob Naplin, Minnesota Department of Natural Resources

10:20 - (3) **"Pheasant control measures on prairie-chicken sanctuaries in Jasper County, Illinois"** - Scott Simpson, Illinois Department of Conservation; and Ron Westemeier, Illinois Natural History Survey

10:40 - (4) **"Effect of prairie distribution on daily movements and home ranges of hen prairie-chickens"** - Loren Burger, David Jones and Mark Ryan, University of Missouri; and Alice Wywialowski, Missouri Department of Conservation

11:00 - (5) **"Greater prairie-chicken breeding ecology and mortality in relation to habitat pattern"** - David Jones, Loren Burger, and Mark Ryan, University of Missouri

11:20 - (6) **"Movement of female greater prairie-chickens in relation to lek location"** - Mike Schroeder, Colorado State University

11:40 - Lunch -

Chairman - Terry Wolfe, Minnesota Department of Natural Resources

1:00 - (7) **"Reestablishment of the northern greater prairie-chicken on the Crescent Lake National Wildlife Refuge in Nebraska"** - Mark Heisinger and Kevin Brennan, U.S. Fish and Wildlife Service

1:20 - (8 **"Translocation, movements, and habitat use of South Dakota prairie-chickens"** - Larry Fredrickson, South Dakota Department of Game, Fish, and Parks

1:40 - (9) **"Nest site fidelity in radio-tagged prairie-chickens"** - John Toepfer and Jay Newell, Montana State University

2:00 - (10) **"Structural characteristics of Attwater's prairie-chicken habitat"** - Mike Morrow and Nova Silvy, Texas A & M University

2:20 - Refreshment break

2:50 - (11) **"Sharptails, brushlands, and a Society in Minnesota"** - Bill Berg, Minnesota Department of Natural Resources

3:10 - (12) **"Sharptails into the shadows? Not by a long shot!"** - Larry Gregg, Wisconsin Department of Natural Resources

3:30 - (13) **"The effects of a hunting closure on an isolated sharp-tailed grouse population in northwestern Wisconsin"** - John Toepfer, Montana State University

3:50 - (14) **"Sharp-tailed grouse habitat revitalization in the Interlake Region of Manitoba"** - Robert Berger and Rick Baydack, University of Manitoba

4:10 - (15) **"Mate choice and egg quality of sharp-tailed grouse in Manitoba"** - Mike Gratson, University of Victoria, British Columbia

4:30 - (16) **"Sharp-tailed grouse management in Alberta"** - David Moyles, Alberta Department of Energy and Natural Resources

4:50 - Free time

6:00 - Social hour -

7:00 - "Greetings" - Donald Sargeant, Chancellor, University of Minnesota Technical College
Banquet and program - U.M.C. Food Service

Thursday, 17 September

7:00 a.m. Leave from Experiment Station for all day field trip to see prairie-chicken and sharp-tailed grouse habitat - Jerry Maertens and Terry Wolfe, field guides. (Coffee and lunch provided in the field.)

6:00 p.m. B-B-Q and accessories at Wetlands, Pines and Prairie Audubon Sanctuary, Warren

Friday, 18 September

8:00 - Coffee

Chairman - Jim Mattsson, U.S. Fish and Wildlife Service

8:30 - (17) **"Nesting and brood-rearing ecology of sharp-tailed grouse in relation to specialized grazing systems"** - Kevin Grosz, North Dakota State University; and Jerry Kobriger, North Dakota Game and Fish Department

8:50 - (18) **"Location of sharp-tailed grouse nests and broods in relation to land use and vegetation at Lostwood National Wildlife Refuge"** - Arnie Kruse, Northern Prairie Wildlife Research Center, U.S.F. & W.S.

9:10 - (19) **"Movement and habitat use by Columbian sharp-tailed grouse in Colorado"** - Ken Giesen, Colorado Division of Wildlife

9:30 - (20) **"Habitat selection by Columbian sharp-tailed grouse in western Idaho"** - Jeff Marks and Vicki Saab Marks, U.S. Bureau of Land Management

9:50 - Refreshment break

10:20 -(21) **"Evaluation of aerial and ground transects to inventory lesser prairie-chickens in southeast Colorado"** - Ken Giesen, Colorado Division of Wildlife

10:40 -(22) **"Long-term fluctuations of sage grouse"** - Terry Rich, U.S. Bureau of Land Management

11:00 - Prairie Grouse Technical Council Business Meeting

12:00 - Lunch -

"PRAIRIE CHICKENS ON THE SHEYENNE NATIONAL GRASSLANDS" SYMPOSIUM

1:00 - Introduction - Ardell Bjugstad and Tom Nichols, U.S. Forest Service

1:10 - (23) **"Prairie-chicken populations of the Sheyenne Delta"** - Jerry Kobriger and Dave Vollink, North Dakota Game and Fish Department; Mike McNeill, U.S. Forest Service; and Ken Higgins, South Dakota State University

1:30 - (24) **"Grassland habitat types of the Sheyenne Delta"** - Bill Barker, Mario Biondini, Lee Manske, and Tim Nelson, North Dakota State University

1:50 - (25) **"Habitat usage by prairie grouse on the Sheyenne National Grasslands"** - Lee Manske and Bill Barker, North Dakota State University

2:10 - (26) **"A method for trapping prairie grouse hens on display grounds"** - John Toepfer and Jay Newell, Montana State University; and John Monarch, Pittsburg and Midway Coal Company

2:30 - (27) **"Summer brood-rearing ecology"** - Jay Newell and John Toepfer, Montana State University; and Mark Rumble, U.S. Forest Service

2:50 - Break

3:20 - (28) **"Winter ecology of the greater prairie-chicken on the Sheyenne Grasslands"** - John Toepfer and Robert Eng, Montana State University

3:40 - (29) **"Summer and winter prairie-chicken diets"** - Mark Rumble, U.S. Forest Service; Jay Newell and John Toepfer, Montana State University

4:00 - (30) **"Manipulation of habitat by fire and mowing"** - Bill Barker and Lee Manske, North Dakota State University; and Ken Higgins, South Dakota State University

4:20 - (31) **"Effects of grazing management treatments on grassland plant communities and prairie grouse habitat"** - Lee Manske, Bill Barker, and Mario Biondini, North Dakota State University

4:40 - (32) **"Management of livestock to improve prairie-chicken habitat"** - Robert Eng, John Toepfer, and Jay Newell, Montana State University

5:00 Summarization - Ardell Bjugstad and Tom Nichols

Dinner -

Saturday, 19 September

1:00 - Post-Conference Field Trip - Prairie-Chicken Management on the Sheyenne National Grasslands - Lisbon, ND. Bill Fortune and Mike McNeill, U.S. Forest Service, Leaders

1. LAND USE CHANGES, FUR PRICES, AND PRAIRIE-CHICKEN POPULATIONS IN POLK COUNTY, MINNESOTA - Dan Svedarsky, University of Minnesota; and Terry Wolfe, Minnesota Department of Natural Resources

The greater prairie-chicken was featured at a conference in 1973 which summarized its history, current status, and recommended beneficial actions. Increased land acquisition and management, censusing, and research focused on chickens in their range in northwestern Minnesota. Intensive censusing has been carried out in the 50,000-acre Kertsonville Study Area in Polk County from 1974 to 1987. High small grain prices in the mid-1970s stimulated the conversion of grasslands to croplands and, by 1987, only 18% of the area remained in grass compared to around 50% in 1975. Over half (57%) of the remaining grass is in state D.N.R. or Nature Conservancy ownership. Chickens have been impacted through habitat loss and are restricted to grassland habitat "islands" for nesting and brood rearing, presumably increasing their vulnerability to predators. Fox fur prices were found to be highly correlated ($r=+0.85$, $P<0.01$) with booming ground counts 2 springs later over a 14-year period. Fur prices tend to influence trapping pressure and presumably predator numbers, particularly red foxes and skunks. Improved habitat island management, perhaps trapping promotion, and/or higher pelt prices, and the Cropland Reserve Program should all help to reverse the downward trend in prairie-chicken numbers.

2. BOG CHICKENS - GREATER PRAIRIE-CHICKENS ON THE SEDGE MEADOWS IN HUBBARD COUNTY, MINNESOTA - Rob Naplin, Minnesota Department of Natural Resources

Southeastern Hubbard County is the northern limit of the north central range of the greater prairie-chicken in Minnesota. Nearly 23,000 acres of this area were burned in 1976. Spring booming ground censusing began in 1977 with males first observed in 1981. From 1985 through 1987, 16 to 22 males were identified on 5 grounds within a 16-square mile area in association with a 4000-acre Type III wetland

complex. All grounds were located on lowland sites characterized by sedge, cattail, brush and blueberry on floating bog with water conditions varying from moist ground to depths of 2 feet. This may be a sign of deteriorating habitat, since many of the upland sites have naturally revegetated to aspen and jack pine or were planted to Norway and jack pine. With this loss of open upland sites, habitat manipulation through mechanical shearing and herbicide application has been implemented and prescribed burn treatments are planned to slow and possibly reverse plant succession to maintain the existing prairie-chicken population. During January 1987, 85 acres of off-site aspen were sheared. Some areas were also piled to allow a comparison to shearing only. On April 24, 1987, 3 males were observed booming on a sheared site where the slash was piled. Thirty acres of the sheared sites were aerially sprayed in late August with Rodeo herbicide. Another 60 acres of the sheared area were sprayed by ground application in mid-September with Rodeo mixed with a wetting agent. The piles will be burned in winter and spring 1987-88. Three sites with remnant grass will be burned in spring 1988. Firebreaks are planned for controlled burning of the sheared and standing off-site aspen for conversion to grass. Evaluation of response to treatments will lead to better management of these "bog" prairie-chickens.

3. PHEASANT CONTROL MEASURES ON PRAIRIE-CHICKEN SANCTUARIES IN JASPER COUNTY, ILLINOIS - Scott Simpson, Illinois Department of Conservation; and Ron Westemeier, Illinois Natural History Survey

Ring-necked pheasants (Phasianus colchicus) currently pose a serious threat to the preservation of Illinois prairie-chickens (Tympanuchus cupido). Since 1970, parasitism of prairie-chicken nests by pheasants has increased to over 40%, resulting in an estimated 18-19% annual loss of the prairie-chicken chick population. Extirpation in the near future is highly probable on 1 of only 2 areas supporting remnant flocks, unless pheasant numbers are controlled. Pheasants were reduced on sanctuaries during

1986 and 1987 using on-foot nest searches, artificial nests, discreet shooting, live trapping and a controlled shoot via state personnel. On-foot nest searches resulted in the removal of 17 incubating hens and 322 eggs in 1986. Five of 12 parasitized prairie-chicken nests were found early enough in 1986 so that pheasant eggs could be removed, thus facilitating the success of all 5 nests. Artificial nests resulted in the collection of 61 parasitic pheasant eggs from 19 of 79 nests placed on sanctuaries. Live trapping, discreet and opportunistic shooting resulted in the removal of 30 pheasants in 1986. None of these methods offered a satisfactory, cost effective, long-term solution to controlling pheasants, however opportunistic shooting was most efficient. Thus, a controlled shoot in conjunction with cover manipulation designed to concentrate pheasants in winter was implemented in January 1987. The controlled shoot removed 49 pheasants (64% of the pheasants flushed) from the sanctuaries and was judged a success. Since the shoot, project personnel have removed an additional 50 pheasants and 99 eggs via shooting and on-foot nest searches. Apparently, as a result of the removal of about 150 pheasants and 400 eggs from the sanctuaries, the 1987 spring crowing cock count was approximately 65% lower than in 1986. Pheasant nest densities on the sanctuaries in 1987 were lowered by 47%, however, the nest parasitism rate of prairie-chicken nests remained at 38%. The continued high rate of parasitism was attributed to the rumored release in early April of approximately 50 pen-raised hen pheasants on or near the sanctuaries. Cover manipulations designed to concentrate pheasants in winter plus annual shooting of both sexes may be needed in concert with efforts to modify local sentiments toward prairie-chickens/pheasants and legal aspects of possessing pheasants.

4. EFFECT OF PRAIRIE DISTRIBUTION ON DAILY MOVEMENTS AND HOME RANGES OF HEN PRAIRIE-CHICKENS - Loren Burger, David Jones and Mark Ryan, University of Missouri; and Alice Wywialowski, Missouri Department of Conservation.

Twenty-five female greater prairie-chickens (Tympanuchus cupido) were radio-tagged with 13 g, bib-mounted, solarnicad transmitters in each of 2 study areas representing different distributions of native prairie. One area (Taberville) contained a population of prairie-chickens associated with a large (1600 a) isolated tract of intensively-managed native prairie. The second area represented a population of birds inhabiting a mosaic of small prairie tracts (40-320 a) distributed throughout intensively-cultivated or heavily-grazed private land. Median daily movements were not different between areas during nesting or fall/winter periods; however, during the postnesting/brood-rearing periods, hens inhabiting the mosaic area exhibited greater daily movements than did hens in the large tract. In both areas, median daily fall/winter movements were greater than median daily movements during nesting and postnesting/brood rearing than the nesting periods. In the mosaic area, hens exhibited greater median daily movements during postnesting/brood rearing than during the nesting period. However, in the large tract, median daily movements did not differ between nesting and postnesting/brood-rearing periods. Although median daily movements were greatest during fall/winter, 3 and 1 large (> 12 km) dispersal movements in Dade and at Taberville, respectively, were observed during the nesting period. Movements > 1.6 km were frequently observed after a hen's nest was destroyed. Annual home range estimates were obtained for 3 hens in the mosaic area and 4 in the large tract. Median home range as estimated by the Minimum Convex Polygon technique (minimum area covered) was greater for hens in Dade County than at Taberville. However, median annual home range as estimated by Harmonic Mean Estimator (utilization distribution) did not differ between areas.

5. GREATER PRAIRIE-CHICKEN BREEDING ECOLOGY AND MORTALITY IN RELATION TO HABITAT PATTERN - David Jones, Loren Burger, and Mark Ryan, University of Missouri

Breeding ecology and mortality of greater prairie-chickens (Tympanuchus cupido) inhabiting a prairie-agriculture mosaic

and a large, prairie island in southwestern Missouri were compared during 1986-1987. Using radio-telemetry on 48 females in the prairie-agriculture mosaic and 55 in the prairie island, we located 32 and 40 nests, respectively. Hens inhabiting the prairie-agriculture mosaic nested in 9 different cover types. Sixty-one percent nested at distances greater than 1.6 km from the capture lek. Three cover types were used by nesting hens associated with the large tract and 88% of the nests were in native prairie cover types. Seventy-seven percent of the nests were less than 1.6 km from hens' capture lek. Spring dispersal movements greater than 9.6 km were recorded. No significant difference ($P>0.05$) in nest success between the 2 study areas was detected. Mortality patterns in both areas demonstrated heavy depredation, primarily by raptors, on nesting hens. Mortality rates were high in both areas, but higher in the prairie-agriculture mosaic. Raptors accounted for most of the predation at both study sites.

6. **MOVEMENT OF FEMALE GREATER PRAIRIE-CHICKENS IN RELATION TO LEK LOCATION - Michael A. Schroeder, Department of Fishery and Wildlife Biology, Colorado State University**

The movement of female greater prairie-chickens, in relation to the leks where they were captured, is an important management consideration, especially as it relates to nesting habitat and location. Additionally, numerous theories incorporate female movement and/or home range size in hypotheses that explain the possible evolution of lek behavior from its territorial precursor. A current theory suggests that lek dispersion is a function of female ability to detect leks, and female home range size (Bradbury 1981). Bradbury predicted that most females should visit only 1 lek, and female home ranges should have diameters less than the inter-lek distances. To test this hypothesis, 52 radio-marked female greater prairie-chickens (21 in 1986 and 31 in 1987) were monitored in northeastern Colorado during the breeding season. The mean distance between a female's nest location and the particular lek where she was captured was 2.9 km. A total of 41 females (79%) nested closer to a different lek than the one where they were caught. Additionally, direct observation of females indicated that visits to more than 1 lek were common (at least 55%). These results suggest that the theory put forth by Bradbury to explain lek evolution should be rejected. The long movements of females between nest and lek locations also indicate that movement capabilities should be an important management consideration.

7. **REESTABLISHMENT OF THE NORTHERN GREATER PRAIRIE-CHICKENS ON THE CRESCENT LAKE NATIONAL WILDLIFE REFUGE IN NEBRASKA - Mark Heisinger and Kevin Brennan, U.S. Fish and Wildlife Service**

Prairie-chickens were once common on Crescent Lake National Wildlife Refuge. However, extensive annual haying and grazing on the refuge and the surrounding area resulted in the extirpation of the prairie-chicken by the early 1970's. By the early 1980's, improvement in grassland management practices appeared to provide adequate habitat on the refuge to allow for a successful reintroduction effort. In 1984, the 3-year program commenced with winter trapping. A total of 26 males and 6 females were trapped and relocated to the refuge. A passive release technique was utilized with an artificial booming ground and a 24-hour timer constructed. In April, the spring trapping effort involved setting walk-in traps on booming grounds and equipping the females with radio transmitters. Twelve female chickens were equipped with transmitters; however, no transmitted birds were recovered. In the winter of 1985, 18 males and 5 females were trapped and relocated to the refuge. In April, spring trapping efforts again utilized walk-in traps on booming grounds; however, all birds caught were relocated to the refuge. A total of 53 males and 56 females were relocated to the refuge. Four clutches of wild prairie-chicken eggs were collected from private sources and placed under incubating sharp-tailed grouse hens. All 4 clutches successfully hatched (49 of 51 eggs). In 1986, spring trapping again occurred on booming grounds. A total of 65 males and 49 females were trapped and relocated to the refuge. Two

clutches of eggs were collected and placed under incubating hens and 19 of the 26 eggs successfully hatched.

In summary, a total of 278 prairie chickens were released on Crescent Lake National Wildlife Refuge (162 males, 116 females). An additional 71 prairie-chicken eggs were successfully hatched under surrogate incubating hens. At least 1 booming ground has been established with displaying males present on this ground in 1985, 1986, and 1987 and females present in both 1986 and 1987. Other prairie-chickens were heard and other leks as well as natural reproduction are suspected.

8. **TRANSLOCATION, MOVEMENTS, AND HABITAT USE OF SOUTH DAKOTA PRAIRIE-CHICKENS - Larry Fredrickson, South Dakota Department of Game, Fish and Parks**

Translocation of prairie chickens by several states in past years has often resulted in failures. A successful method is necessary for increasing the range of this species and utilizing much habitat in former range that has recently become suitable because of state and federal land management programs. The suggested method we tried was; capture, radio tagging and release of older birds during the spring booming and nesting season, recapture of surviving radioed birds along with night-lighting capture of young in late summer, then translocation of both age classes during the period of late summer-early fall. Some radioed birds were left on the Fort Pierre National Grasslands in order to compare normal fall-winter-spring movements and habitat use with those of prairie-chickens on the Leola release area. Twenty nine prairie-chickens were slow released on the Leola area artificial lek (12 females, 15 males, 2 unknown sex) in 1986. Nine of these 29 birds were radioed (6 males, 3 females). On March 31, 4 radioed birds had returned (homed back) to the release area from wintering areas 6, 7, 21 and 27 miles away (in various directions). On May 14, 5 males were displaying on the nearby Waterfowl Production Area on 2 different grounds (not on the artificial release lek). Two of the radioed males displayed with 2 others on a ground and 1

displayed alone nearby. Two additional unradioed prairie-chickens were seen in the nearby area that day and a fix was obtained on another radioed male nearby. Translocations to the Leola area will be continued for 2 more years.

9. **NEST SITE FIDELITY IN RADIO-TAGGED PRAIRIE-CHICKENS - John Toepfer and Jay Newell, Montana State University**

Information collected from radioed greater prairie-chickens nesting in central Wisconsin (1972-74) and in North Dakota, (1983-86) was examined with regard to site fidelity for renests and for nests of the same individual in successive years. Adults were more likely to renest than immatures (88.8% versus 27.8%). Adults initiated 1.63 ± 0.637 nests per season, immatures 1.25 ± 0.438. Three adult hens renested twice in one season. Most renesting immature hens responded to the destruction of their initial nest by leaving the area (mean distance=3477 ± 3195 m), while adults tended to renest in the vicinity of their initial nest (1220 ± 1968 m). Of the 9 hens whose nests were located 2 years in a row, all were in the vicinity of the same booming ground and all were within 1100 m of their previous year's last nest (mean=545 ± 402 m). Four hens nested within 60 m of their previous year's last nest. Spring movement patterns of hens and the role of annual nest site fidelity is discussed relative to management and population regulation.

10. **STRUCTURAL CHARACTERISTICS OF ATTWATER'S PRAIRIE-CHICKEN HABITAT - Mike Morrow and Nova Silvy, Texas A & M University**

Radio telemetry equipment was used to collect habitat use data on 49 Attwater's prairie-chickens (Tympanuchus cupido attwateri) from March 1983-July 1985 on the Attwater Prairie-Chicken National Wildlife Refuge. Second-year and older burns on loamy grassland areas were selected with the

greatest intensity of all habitat types during winter and spring by males and nonreproductive females. A variety of habitat types were used during summer and fall by these birds. Rank correlations of habitat use with vegetation structural measurements taken from transects, and Chi-square comparisons of mean structural characteristics of habitats used to those available, suggested that quality grassland cover with obstruction of vision values in the 2-dm range were important during the critical winter and nesting periods. Grazing should be regulated so that clumped midgrass in the 2.5-dm range is available for nesting by the 3rd growing season after a burn. Broods used grassland stands typified by 2nd-year and older burns on loamy and sandy areas prior to 15 June. After 15 June, broods used more open coarse sand and 1st-year burned areas.

11. **SHARPTAILS, BRUSHLANDS AND A SOCIETY IN MINNESOTA - Bill Berg, Minnesota Department of Natural Resources**

Sharp-tailed grouse inhabit a mosaic of open grass-brushlands and muskeg extending across the northern half of Minnesota. Due to extensive habitat loss, sharptail populations have declined drastically since the 1940's (1949 hunter harvest:150,000, 1984-86 harvests:5,000 annually). From 1982 to 1986, spring populations declined 62%. Causes of habitat loss have been (1) natural succession encouraged by efficient wildfire suppression and minimal prescribed burning, (2) clearing of grass-brushland habitats for intensive agricultural development, and (3) conversion to conifer plantations. Several factors have the potential to reverse this downward trend: (1) education of Minnesota Department of Natural Resources (DNR) foresters regarding the sharptail's habitat needs and the ecological values of grass-brushland habitats, (2) implementation of Forestry-Wildlife Habitat Guidelines for sharptail management, (3) approval of a DNR Prescribed Burn Policy, which should permit more prescribed burning, (4) development of long range plans for the management of sharptails and their brushland habitat, (5) appropriation of the first funds dedicated by DNR for

sharptail management ($120,000) by the 1986 Legislature's landmark Reinvest In Minnesota (RIM) program, (6) passage of the USDA's Conservation Reserve Program (CRP) which will plant in excess of 500,000 acres of marginal agricultural land in the northwest sharptail range to grass and legumes, and (7) formation of the Minnesota Sharp-tailed Grouse Society (MSGS) in spring 1986. MSGS presently has approximately 350 members. It's objective is to improve the status of sharp-tailed grouse in Minnesota through the political and educational systems. MSGS has already increased awareness of the sharptail's problems and influenced funding for sharptail management, with emphasis on prescribed burning. MSGS publications include a quarterly newsletter, a general informational brochure, and a sharp-tailed grouse management guide for private landowners.

12. **SHARPTAILS INTO THE SHADOWS? NOT BY A LONG SHOT! - Larry Gregg, Wisconsin Department of Natural Resources**

Wisconsin's sharptail population has experienced a long-term decline due to the disappearance of open and brushland habitats throughout the state. Only scattered remnants exist of the 12 million acres of prairie and savanna that were once present, causing the wildlife species dependent upon such plant communities to become progressively more scarce in the state. Fewer than a dozen of Wisconsin's 72 counties now hold viable sharptail populations and surveys indicate that statewide breeding populations may total less than 2,000 birds. If present trends continue, sharptails may eventually be found only in those sites which are being managed for their benefit. Because designated management areas appear to be the key to the future existence of sharptails in Wisconsin, it is imperative that we set aside and develop a sufficient amount of habitat to guarantee the survival of the species. This report contains a series of recommendations which, if implemented, will ensure that the music of the dancing ground on a fresh spring morning will never be completely stilled.

13. THE EFFECTS OF A HUNTING CLOSURE ON AN ISOLATED SHARP-TAILED GROUSE POPULATION IN NORTHWESTERN WISCONSIN - John Toepfer, Montana State University[1]

In 1975, the sharp-tailed grouse hunting season was closed on the Crex Meadows Wildlife Area located in northwestern Wisconsin. Following this closure, dancing ground counts increased from 14 to 63 cocks in 4 years. In 1980, the sharp-tailed grouse season was reopened, but only in the eastern half of the area. After two hunting seasons, counts declined from 63 to 34 cocks. The largest declines occurred on those grounds located in the area open to hunting, while counts in the closed area remained relatively stable.

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[1] Information from 1975-1978 collected while at College of Natural Resources, University of Wisconsin, Stevens Point

14. SHARP-TAILED GROUSE HABITAT REVITALIZATION IN THE INTERLAKE REGION OF MANITOBA - Robert Berger and Rick Baydack, University of Manitoba

Prairie sharp-tailed grouse (Tympanuchus phasianellus campestris) use of altered habitat was studied during spring and summer 1987 in the Narcisse Wildlife Management Area, southcentral Manitoba. Two unused historical leks and two designated areas were cleared of vegetation by bulldozing and mowing, changing ubiquitous stands of aspen into open prairie habitats. Traditional leks within the study area were used as models to revitalize habitat, especially with respect to elevation, shape, and surrounding cover. Effects of manipulation were compared to unaltered lek habitat by examining the vegetation height, dominant species, and visibility within and between areas. Grouse use of manipulated versus unmanipulated habitat was monitored by means of daily band and radio transmitter relocations. One revitalized area attracted males which displayed on a central hill in spring, and at least one female. Grouse sign was observed on other manipulated areas.

15. MATE CHOICE AND EGG QUALITY OF SHARP-TAILED GROUSE IN MANITOBA - Mike Gratson, University of Victoria, British Columbia

By removing clutches of incubating hens I forced females to go back to the lek and breed again, either with previously proven successful males (to control females) or, by removing successful males at certain times at dancing grounds, with males that had not been previously successful with females (to experimental females). The effects of mate (choice) on fertility and egg sizes of these 2 groups of renest clutches were then determined.

16. SHARP-TAILED GROUSE MANAGEMENT IN ALBERTA - David Moyles, Alberta Department of Energy and Natural Resources

The Alberta Fish and Wildlife Division has conducted long-term studies of sharp-tailed grouse in prime aspen parkland cover found in Camp Wainwright, a military camp in east-central Alberta. Annual spring counts of males on dancing grounds and hunter check stations have been conducted since 1968. Survey results indicate a possible inverse relationship between numbers of adult males on dancing grounds in spring and the number of juveniles in the fall. Possible reasons suggested are excess competition among males (reducing mating efficiency) or competition among females for nesting cover. As the coverage of aspen within 800 m of a dancing ground increases, the attractiveness of the area for females and their broods diminishes. Dancing grounds that do not attract females and their broods in fall are doomed to extinction.

17. NESTING AND BROOD-REARING ECOLOGY OF SHARP-TAILED GROUSE IN RELATION TO SPECIALIZED GRAZING SYSTEMS - Kevin Grosz, North Dakota State University; and Jerry Kobriger, North Dakota Game and Fish Department

In 1984, a study was initiated at the Central Grasslands Research Station to determine the effects of short-duration, deferred-rotation, and season-long grazing on the productivity, nesting success, nesting, and brood-rearing habitat of sharp-tailed grouse. Sharp-tailed grouse hens were trapped, either on the dancing grounds close to the grazing treatments or from nests located by cable-chain nest searching. All captured hens were fitted with radio-transmitters, mounted on a poncho. Over the 3-year study period, 46 grouse hens were fitted with radio-transmitters and 45 nests were found. Due to a small sample size in the short-duration and season-long grazing treatments, data were combined for all the grazing treatments and analysed as grazed versus nongrazed. Twenty-one nests were found in the grazed treatments and 24 in the nongrazed. Nesting success was greater in the grazed treatments (76%) than the nongrazed areas (50%), although this was not significant at $P<0.05$. Mayfield nesting success was 67.2% in the grazed treatments and 48.3% in the nongrazed areas; this also was nonsignificant. Visual obstruction readings in the grazed treatments averaged 1.82 dm and 1.78 dm in the nongrazed areas. There was no significant difference for successful and unsuccessful nests in the grazed and nongrazed treatments. Broods utilized a variety of habitats mainly in the nongrazed areas of the study.

18. LOCATION OF SHARP-TAILED GROUSE NESTS AND BROODS IN RELATION TO LAND USE AND VEGETATION AT LOSTWOOD NATIONAL WILDLIFE REFUGE - Arnie Kruse, Northern Prairie Wildlife Research Center, U.S.F. & W.S.

Data on 214 sharp-tailed grouse (Tympanuchus phasianellus) nests were collected during an 8-year burning and grazing study at Lostwood National Wildlife Refuge in northwestern North Dakota. Vegetation at nests was predominantly western snowberry (Symphoricarpos occidentalis) (45%) and Kentucky bluegrass (Poa pratensis) (28%) and nests were generally located in western snowberry with an understory of grass (59%) or in grass with an overstory (<50%) of snowberry (32%). The highest density of nests was in the spring burn

treatment and the lowest in the spring grazing treatment. The highest nest density occurred in the fourth growing season after treatment and hatched nests per 100 acres were highest in the second growing season following treatment. Broods were also attracted to areas during the second growing season with almost 5 broods per 100 acres found on these fields. The highest density of broods was found on the spring graze treatment and the lowest on the areas in non-use for 7 or more years. Sharp-tailed grouse nests had 100% survival during prescribed burns carried out in June.

19. MOVEMENT AND HABITAT USE BY COLUMBIAN SHARP-TAILED GROUSE IN COLORADO - Ken Giesen, Colorado Division of Wildlife

Mean monthly dispersal from lek of capture was analyzed for 18 male and 20 female radio-marked Columbian sharp-tailed grouse (Tympanuchus phasianellus columbianus) in northwest Colorado. April-December mean dispersal distance was less for males than females (605 m vs. 1475 m, $P<0.05$). Males remained significantly ($P<0.05$) closer to leks than females in spring (16 Mar-31 May; 229 m vs. 1394 m) and summer (1 Jun-31 Aug; 858 m vs. 1603 m) but not in autumn (1 Sep-31 Oct; 1276-1606 m). Radio telemetry indicated both sexes remained within 3.0 km of the lek of capture (>95% of March-December locations). Analysis of availability and use of different habitat types indicated both sexes were located most often in mountain shrub communities but males also tended to select hay pasture habitat more often than expected. Visual obstruction readings (VOR) were similar between sexes for each habitat type and were not different from random sites except for male preference for higher VOR in hay meadows. Dispersal differences by male and female sharp-tailed grouse may result primarily from different seasonal habitat requirements although the dispersal may also function to decrease competition for resources and perhaps to lessen predation.

20. **HABITAT SELECTION BY COLUMBIAN SHARP-TAILED GROUSE IN WESTERN IDAHO - Jeff Marks and Vicki Saab Marks, U.S. Bureau of Land Management**

Columbian sharp-tailed grouse (Tympanuchus phasianellus columbianus) occupy less than 10% of their original range. They no longer occur in Oregon, California, and Nevada, and have been reduced to remnant populations in Utah, Montana, and Washington. Sharptails are very rare in western Idaho but are still hunted in the eastern part of the state. Overgrazing by livestock and conversion of native range to agriculture are responsible for the decline of Columbian sharptails. In 1983, the Bureau of Land Management initiated a 3-year study of the year-round habitat requirements of a remnant population of sharptails in western Idaho. Most of the data came from vegetational and topographic measurements at 716 flush sites of 15 radio-collared grouse. Habitat characteristics were also measured at random sites from May through July in 1984 and 1985. Summer macrohabitat analysis revealed that grouse overused the big sage (Artemisia tridentata) cover type relative to availability and avoided the eriogonum (Eriogonum spp.) cover type. Compared with the other cover types, the big sage type had moderate to high vegetational cover, a high diversity of plant species, and the best development of native forbs and grasses. Mountain shrub and riparian cover types were used primarily for escape cover. Compared with random sites, sharptails used areas with greater canopy coverage of arrowleaf balsamroot (Balsamorhiza sagittata), greater horizontal and vertical plant cover, greater canopy coverage of decreaser forbs, and greater canopy coverage of bluebunch wheatgrass (Agropyron spicatum). During winter, sharptails were closely tied to riparian hawthorn and mountain shrub patches, both of which were critical sources of food and escape cover. The availability of suitable winter habitat is probably the most important factor in determining whether an area will support sharptails. To conserve native populations of Columbian sharptails, managers need to (1) acquire and protect habitats that currently support sharptails, and (2) improve the condition of public rangelands.

21. **EVALUATION OF AERIAL AND GROUND TRANSECTS TO INVENTORY LESSER PRAIRIE-CHICKENS IN SOUTHEAST COLORADO - Ken Giesen, Colorado Division of Wildlife**

Helicopter quadrat surveys and roadside listening transects were evaluated as indices for documenting lesser prairie-chicken (Tympanuchus pallidicinctus) population size as reflected by lek densities. Single helicopter surveys during the peak of hen attendance on leks detected an average of 86.7% (range 77.8-100%) of known leks on 3 quadrats (size 44-60 km^2) but only 46.7% (range 0-100%) of the same quadrats 2 weeks later. Leks were not detected on aerial quadrats unless grouse flushed. Observers detected 62.5% (range 60.0-66.7%) of known leks within 1.6 km of roadside listening transects (length 19-22 km) during the peak of hen attendance when winds were <10 km/hr. Winds exceeding 25 km/hr decreased detectability of leks to 11.1%. Two weeks after peak hen attendance, observers detected 53.8% (range 33.3-80.0%) of known leks. Observer differences were documented with 1 observer detecting 50.0% of leks and the 2nd observer detecting only 30.8% of leks under all conditions. Observed variability in both indices suggests lesser prairie-chicken population changes may not be detected using current technologies.

22. **LONG-TERM POPULATION FLUCTUATIONS OF SAGE GROUSE - Terry Rich, U.S. Bureau of Land Management**

Counts of male sage grouse (Centrocercus urophasianus) on leks in Idaho have declined significantly since 1950. Counts in Oregon have declined significantly since 1941. Counts in Utah, Nevada, Montana, and North Dakota show no significant trends although data are probably inadequate in the latter 3 states. The mean lek count for each state fluctuated substantially over the years while individual lek counts fluctuated together more than expected by chance. The mean lek count from all 6 states and harvest data from Idaho and Utah have a number of significant intercorrelations. Spectral analysis of these data suggests that

the fluctuations are closer to being cyclical than random or irregular. In Idaho, neither selected weather data nor predator-prey interactions involving cyclical black-tailed jackrabbit populations explain the lek count fluctuations observed. The apparent wide-spread synchrony of the fluctuations remains to be explained.

23. **PRAIRIE-CHICKEN POPULATIONS OF THE SHEYENNE DELTA - Jerry Kobriger and Dave Vollink, North Dakota Game and Fish Department; Mike McNeill, U.S. Forest Service; and Ken Higgins, South Dakota State University**

The Sheyene National Grasslands, under administration of the U.S. Forest Service, is located in southeastern North Dakota about 30 miles from both Minnesota and South Dakota. There are 70,180 acres under Federal administration but 64,600 acres of private land are also included within the grassland boundary. These public lands were obtained by purchase in the 1930's under the Bankhead-Jones Farm Tenant Act. Major land use practices have been grazing and farming, but in more recent years recreation and wildlife values have been recognized and are gaining on the traditional uses in importance. Prairie-chickens (Tympanuchus cupido pinnatus) were first censused on the grasslands in 1961, with sporadic counts through 1971. The census gradually intensified through 1979 and the effort has remained fairly constant since then. The prairie-chicken population was extremely low in the 1960's. Counts did not reach double digits until 20 males were seen in 1971. Total male counts ranged from 20 to 200 through 1978, reached a peak of 410 in 1980 (39 active grounds) and have fluctuated since that time. Over the past 10 years, the number of breeding males has varied from 137 to 410 (x=267). The number of active grounds has varied from 17 to 39 (x=28) during the same period. Suffi-cient evidence exists to link the increase in numbers of prairie chickens on the grasslands from 1961 through 1987 to changes in land management, primarily the introduction of rotational grazing practices and prescribed burning of meadows.

24. **GRASSLAND HABITAT TYPES OF THE SHEYENNE DELTA - Bill Barker, Mario Biondini, Lee Manske, and Tim Nelson, North Dakota State University**

The grassland vegetation of the Sheyenne Delta in southeastern North Dakota was characterized according to habitat type based on concepts and methods developed by Daubenmire. Detrended Correspondence Analysis (DCA) was used to summarize the species composition and identify the habitat types. The number of significant ordination axis was determined with the use of the Fisher's proportion test. The habitat types identified through DCA were tested for statistical significance with the use of the Kruskal-Wallis statistics. Five grasslands habitats were described: 1) Stipa comata - Carex heliophila h.t., 2) Andropogon hallii - Calamovilfa longifolia h.t., 3) Bouteloua gracilis - Stipa comata h.t., 4) Andropogon gerardi - Andropogon scoparius h.t., and 5) Carex lanuginosa - Calamagrotis stricta h.t.

25. **HABITAT USAGE BY PRAIRIE GROUSE ON THE SHEYENNE NATIONAL GRASSLANDS - Lee Manske and Bill Barker, North Dakota State University**

The north unit of the Sheyenne National Grasslands consists of 130,560 acres; 67,320 acres of federal land and 63,240 acres of private land. Prairie grouse habitat usage by actual observation was recorded from March 1975 to February 1981. The Robel habitat use index (% of bird locations/% of study area) was used to indicate relative habitat usage. Habitat use index values greater than 1.0 indicated that selection for that habitat was greater than expected if the grouse exhibited no preference. A value less than 1.0 indicated habitat use less than expected. A value of zero indicated avoidance of that habitat type.

Prairie grouse on the Sheyenne National Grasslands primarily used the upland and midland grassland habitat types of the Hummocky Sandhills Habitat Association during the spring and summer. Habitat usage shifted during the fall and winter to

cropland and associated tree shelterbelts. Selection of courtship display ground locations was for the upland and midland habitat types of the Hummocky Sandhills Habitat Association. Habitat use for nest sites was the midland grasslands of the Hummocky Sandhills with switchgrass as the major plant species. A few nest sites were in alfalfa cropland. Prairie grouse hens with broods selectively used upland, lowland and cropland habitat types of the Hummocky Sandhills. Day and night roost sites were predominantly located in midland with switchgrass and lowland habitat types of the Hummocky Sandhills during spring, summer and fall. During the winter, night roosts were located in cropland and shelterbelts of the Hummocky Sandhills and Deltaic Plain and midland with switchgrass of the Hummocky Sandhills. The major habitat type used by prairie grouse for concealment and nesting was the midland grassland habitat type with switchgrass as the dominant species of the Hummocky Sandhills Habitat Association. This habitat type should receive the major emphasis in prairie grouse habitat management planning.

26. **A METHOD FOR TRAPPING PRAIRIE GROUSE HENS ON DISPLAY GROUNDS - John Toepfer and Jay Newell, Montana State University; and John Monarch, Pittsburg and Midway Coal Company**

This paper describes a cost effective method for trapping prairie grouse hens on display grounds. The basic principle of the trap is a drift fence with wire leads to funnel visiting hens into the traps. This trap has been used successfully in an least 6 states and 1 province and on 3 species of grouse to trap hens for radio-tagging. This method is less expensive, and less disruptive than rocket or cannon nests.

27. **SUMMER BROOD-REARING ECOLOGY - Jay Newell and John Toepfer, Montana State University; and Mark Rumble, U.S. Forest Service**

The summer brood ecology of the greater prairie-chicken was studied from June through August in 1983 and 1984 in the Sheyenne National Grasslands. Twenty-two radio-tagged hens hatched 265 chicks, all but 4 of which left the nest. Chick mortality was high, especially in the first 24 days, with only 28.4% surviving to the end of the summer. Brood ranges varied from 22 to 2248 ha with an average of 488.6 ha for 15 broods that had at least one chick alive by mid-August. Several factors appeared to influence the size of the range: timing of the nest, age of the hen, loss or potential loss of young due to predation and/or habitat alteration by mowing or grazing. Although brood ranges were large, hens intensively used segments of the total range. These areas averaged 40.4 ha in size. Broods were relocated in native vegetation 70.1% of the time. When in native vegetation they were relocated in lowlands, midlands, and uplands 45.5, 26.9, and 23.2% of the time, respectively. Broods seldom night roosted in upland vegetation, the community most heavily utilized by cattle in this study. Only one brood made extensive use of cash crops and only 3.1% of all brood relocations were in cash crops. When in agricultural communities, 87.3% of the relocations were in prairie hay and alfalfa. Past and present disturbances appeared to influence the selection of intensive use areas by broods. Broods were seldom relocated in pastures with cattle (26.8%) and usually left areas once they were mowed. Deferred pastures had the greatest number of intensive use areas (10) while prairie hay and alfalfa had 8 and 5, respectively. Population declines in recent years might be due, in part, to the poor brood survival.

28. **WINTER ECOLOGY OF THE GREATER PRAIRIE-CHICKEN ON THE SHEYENNE GRASSLANDS - John Toepfer and Robert Eng, Montana State University**

Twenty-six radio-tagged prairie-chickens (8 cocks, 18 hens) were followed during the winter of 1984-85 on the Sheyenne National Grasslands in North Dakota. A total of 5,736 (4,143 day and 1,563 night) locations were obtained from 9 December to 15 March. Winter survival was high at 58.8%.

Mean winter home range size was 8.4 km^2 (3.2 sq. mi.) and slightly larger for hens than cocks (8.8 km^2 vs. 7.7 km^2). Mean winter to spring movements were 4.4 km for cocks and 6.45 km for hens. All locations were within 6700 m (4 miles) of a known booming ground; 64% were within 2400 m (1.5 miles) with a mean of 20078±980 m. Cocks remained closer to booming grounds than hens (Mean=1797±709 vs. 2327±1178 m). Mean movements from day areas to night roosts were 1085±778 m and were greater for cocks than hens (1358 vs. 1035 m). Mean within day movements were less at 992 m for cocks and 899 for hens. When possible, radioed birds did not use the same roosting area on successive nights as the mean distance between successive night locations was 922 m. Agriculture and grass made up 71.3% of all the winter habitat types used by radioed birds (Agriculture 41.7%, Grass 29.6%). Picked corn made up 70.8% of the agricultural use. Habitat used at night was dramatically different from that used during the day; 66.7% of the night locations were in grassland habitat and 11.8% in shrubs, primarily snowberry. Lowland grass and sedges accounted for 64% of the night use. A breakdown by vegetation height classes showed that 78% of all locations were associated with 9 cm or taller vegetation; 59% with 25-50 cm cover. Over 75% of the night use was in 25 cm or greater vegetation and 77.9% in cover undisturbed within the past 12 months. Within these undisturbed areas night roosting prairie-chickens selected the taller available cover. Management recommendations were discussed.

29. **SUMMER AND WINTER PRAIRIE-CHICKEN DIETS - Mark Rumble, U.S. Forest Service; Jay Newell and John Toepfer, Montana State University**

Diets of prairie-chicken broods were primarily composed of arthropods and sweet clover/alfalfa. Arthropods are high in protein and young gallinaceous birds may require animal protein for proper development. Sweet clover and alfalfa are both leguminous forbs and thus may have been selected for high protein also. Summer diets of adult hens varied monthly. Arthropods were selected in larger quantities

during the brood period. Dandelion flowers were selected during all months but were more important when they were most available in May. Sweet clover/alfalfa were important when they were most available in May. Sweet clover/alfalfa were important items probably due to the high digestible protein levels. Corn kernels were selected during the breeding and prelaying seasons, but were also important in diets after May. Winter diets reflected habitat use patterns. Prairie-chickens selected cash agriculture crops of corn, soybean, and sunflower seeds. Some preference for feeding in sunflowers was noted.

30. **MANIPULATION OF HABITAT BY FIRE AND MOWING - Bill Barker and Lee Manske, North Dakota State University; and Ken Higgins, South Dakota State University**

The effects of spring burning (1 May) and 3 mowing treatments (1 June mow, 1 July mow and 1 August mow) on the floristic composition and utilization by livestock of the Carex lanuginosa - Calamagrostis stricta habitat type were studied. Repeated spring burning eliminates woody species from this habitat type but increases livestock utilization from about 10% to 60%. Repeated mowing eliminates woody species but does not increase utilization by livestock as much as spring burning. July 1 is probably the best time to mow to gain increased livestock utilization and obtain high quality hay. We recommend a change from grazing the 3 pasture deferred rotation grazing systems once-over to grazing 2 pastures twice-over and 1 pasture once-over. Spring burning and mowing are effective in getting better livestock utilization.

31. **EFFECTS OF GRAZING MANAGEMENT TREATMENT ON GRASSLAND PLANT COMMUNITIES AND PRAIRIE GROUSE HABITAT - Lee Manske, Bill Barker and Mario Biondini, North Dakota State University**

Grazing of grasslands by livestock affects vegetation differentially depending on season of use, intensity and duration of grazed and ungrazed periods. Prairie grouse populations respond to these changes in vegetation. Season-long grazing treatments show no benefit to grass basal cover even at low stocking rates. Spring 100% visual obstruction measurements (VOM) are below the minimum 1.5 decimeter level and do not provide adequate nest and roost cover. Prairie grouse select against season-long grazing treatments for spring courtship display ground and nest locations. Pastures grazed for 1 period during the June to September season show no positive response in grass basal cover but do show significantly greater 100% VOM readings compared to season-long grazing treatments. Prairie grouse select against pastures managed with 1 grazing period for display ground and nest locations. Deferred grazing (delay of grazing until after grass seed development (late August) on pastures significantly decreases basal cover of warm season grasses and significantly reduces basal cover of switchgrass on the midland and lowland plant communities. The 100% VOM is significantly decreased during the first growing season after deferred treatments and the level falls below the minimum of 1.5 decimeters. Prairie grouse select against pastures managed with deferred grazing the previous year for spring display ground locations. Deferred grazing is not a desirable grazing treatment for grassland vegetation and prairie grouse.

Warm season grasses and switchgrass on the midland and lowland communities and sedges on the lowland communities increased in basal cover on pastures managed with 2 grazing periods compared to pastures managed with season-long treatments. The 100% VOM on pastures with 2 grazing periods is significantly greater than on pastures grazed season-long. Prairie grouse select for pastures with 2 or 3 grazing periods for display ground and nest locations. Management treatments with the pastures grazed for 2 periods show benefit to grassland vegetation, prairie grouse habitat and prairie grouse populations. Treatments with twice over grazing on each pasture should be used to manage the allotments on the Sheyenne National Grasslands.

32. **MANAGEMENT OF LIVESTOCK TO IMPROVE PRAIRIE-CHICKEN HABITAT - Robert Eng, John Toepfer, and Jay Newell, Montana State University**

Cover requirements of prairie grouse are primarily related to vegetative structure, whereas food needs are species related. Seasonal distribution and intensity of grazing initially alter the structure and ultimately can alter the species composition. Initial successful nests are found in areas of more and higher residual cover than unsuccessful nests. Nesting areas are similar in type and height class to areas used by prairie-chickens for winter and spring roosting. Success of renesting hens is higher than initial nests and this is probably a function of additional cover provided by current year's growth. A key factor influencing prairie grouse numbers lies in the amount and distribution of residual grass cover (15 to 50 cm ht) within 1.5 km of a display ground. On the Sheyenne Grasslands, this cover is almost entirely found in the lowlands and midlands. Grazing and haying management of these two communities will have the greatest impact on prairie-chickens.

BUSINESS MEETING

The business meeting of the 17th Prairie Grouse Technical Council was called to order by chairman Dan Svedarsky at 11:22 a.m., September 18, 1987 at the Northwest Agricultural Experiment Station, University of Minnesota, Crookston.

Minutes of the previous meeting were printed in the proceedings of the Missouri meeting which most members had read. Motion was made by Alice Wywialowski (Missouri) to approve the minutes, seconded by Ken Giesen (Colorado), and approved unanimously.

A financial balance of $322.20 was available from the Missouri meeting and Dan hoped to have a similar nest egg for the next chairman.

Communications by Chairman Svedarsky included: 1) input on an extension brochure on greater prairie-chicken management published by the U.S.F.W.S., 2) comment on an EIA regarding expansion of the Attwater's prairie-chicken refuge system which Nova Silvy indicated is now up to Congress to provide a large sum for that purpose, 3) comment on the management plan for Moquah Barren's Area of Chequamegon National Forest (Wisconsin), 4) input to Kansas State video programs developed by Bob Henderson (will be on satellite TV soon), and 5) newsletter production and miscellaneous correspondence, much of which included queries on obtaining prairie-chickens and sharp-tailed grouse for stocking purposes.

Committee reports started with the subject of awards by Roger Wells (Kansas) who explained that during at least the past 6 years there has been discussion of providing an award for some distinguished member or individual at our biennial meeting. The executive committee, made up of Roger, Dan, and Don Christisen, have proposed some kind of plaque with an appropriate reading and logo that would cost an estimated $30.00. It was then decided to have two awards, including an individual and a company or institution that does a lot for prairie grouse. This would bring the cost to about $60.00. Roger further explained that the committee wanted to bring to the Council and maybe incorporate in the bylaws, a standing committee which would establish the means by which there would be a permanent awards committee which would select, if an appropriate recipient(s) were found, a recipient(s) for an award each biennium. So, Article IX, Section 1 of the draft bylaws lays out some of the criteria for two awards. Arnie Kruse (North Dakota) suggested a monetary increase in registration to pay for the awards. Hans Landel (Indiana) suggested something cheaper. Dan mentioned that private companies really like recognition and that a $30.00 plaque could result in thousands for good habitat work. Ken Giesen also felt that public recognition is good and urged a raise in registration fees by a couple of bucks to pay for awards. Roger concluded the discussion by stating that we want to recognize those individuals or corporations who have made significant contributions to the welfare of prairie grouse. As the professional organization for prairie grouse, we want to officially recognize them and show our appreciation. We will be voting on this part of the draft bylaws, so unless there is an amendment to change that portion, we will be voting on it.

In regard to the bylaws committee, Chairman Dan then mentioned the Fall 1985 newsletter which reviewed the history of the PGTC. The bylaws committee, chaired by Don Christisen, sifted out from that rather long historical document, rules that might best govern our activities. The group was then given a few minutes to review the draft bylaws proposed by that committee.

New business again dealt with bylaws and led to a lengthy discussion as a result of Dan's request for input on the bylaws. A letter from Barry Betts, Bureau of Indian Affairs, Lower Brule of South Dakota, called attention to Article III, Section 1, which limits membership to only state and federal employees. Barry's letter suggested, "that the Council consider allowing other representatives as well as private individuals to become members. The Lower Brule Souix Tribal Wildlife Department is doing an excellent job of managing prairie grouse on 130,000 acres of grouse habitat that is totally under tribal jurisdiction. I'm sure they are interested in becoming members and attending future Council meetings, but under the proposed bylaws they would be unable to do so." (It was also noted that Quail Unlimited staff, university professors, and even graduate students are present members--some even executive committeemen.) "Surely the Council did not intend to be made up of state and federal employees only. I recommend that Section 1 be rewritten." The Betts letter stimulated a lengthy discussion by Svedarsky, Moyles, Brownlee, Giesen, Landel, Toepfer, Mattsson, Smith, Gratson, Toney, Wells, Ward, Berg, Kruse, and others which finally led to a motion by John Ward (Wisconsin) that Article III, Section 1 be stated, "Membership shall be open to anyone interested in prairie grouse." The motion was seconded by Bill Brownlee (Texas) and carried unanimously.

Discussion then centered on membership fees and maintaining the mailing list. Ken Giesen asked for a show of hands which indicated that a majority of attendees were receiving the newsletter. It was generally agreed that response cards were the best way of keeping the mailing list updated. Nonrespondents are simply dropped from the list. Arnie Kruse suggested leaving the possibility of membership fees in the bylaws but for such fees to be determined by each Executive Board as stated in the proposed bylaws. Jerry Kobriger cautioned that asking for a membership fee (e.g. $5.00) would cut the number receiving the newsletter even more than it gets reduced by response cards.

Dan then asked for a consideration of the bylaws as they now stand, recognizing that bylaws are always subject to modification. Motion was made by Wes Burger (Missouri), seconded by Arnie Kruse, to accept the bylaws with the one change regarding membership. Motion carried unanimously.

Unfinished business started with a report by Nova Silvy on the status of the prairie grouse book, a project now spanning 4 years. About 50% of the chapters are in and Nova encouraged authors to keep them coming. The book is to cover all species of prairie grouse. Status sections for the state chapters should be updated. As a result of the success of Val Lehmann's quail book (original edition $10.00, second printing $20.00), Texas A & M Press will publish anything of a similar nature, so the prairie grouse book should sell.

Nova expressed a need for tissue from grouse of the world for studies on genetic diversity. Inbred populations will be of special interest. At least 20 specimens of each species are needed. Findings will be returned to cooperators who wish to have the information. Cooperators should contact Nova (call collect if necessary) for details.

Greg Schenbeck, U.S. Forest Service (Nebraska) announced that the U.S. Forest Service is currently developing habitat recommendations for 650,000 acres of prairie grouse habitat in Nebraska and South Dakota, which includes 200,000 acres of prairie-chicken habitat. Greg asked for names of Council members who would like to be on a mailing list and given an opportunity to have input on plans and guidelines for grazing on public lands, a politically sensitive issue.

Recognizing that Illinois followed the last Minnesota meeting, but that Illinois will be hosting the 1989 Midwest Wildlife Conference, Ron Westemeier asked that their bid be delayed. Invitations were made by Bruce Waage (Montana) and

Gregg Stoll (Michigan) to host the next meeting in 1989. After discussion of facilities and hunting opportunities in each state, a show of hands ruled 24 to 21 in favor of Michigan as host of the next conference with Gregg Stoll as chairman.

Meeting adjourned at 12:30 p.m.

Respectfully submitted,
Ron Westemeier, Acting Secretary

BYLAWS

ARTICLE I - NAME

This organization shall be known as the

PRAIRIE GROUSE TECHNICAL COUNCIL

Section 1

"Prairie grouse" shall include the species of greater prairie-chicken, Tympanuchus cupido pinnatus; Attwater's prairie chicken, T. c. attwateri; the lesser prairie chicken, T. c. pallidicinctus; sharp-tailed grouse, T. phasianellus; and sage grouse, Centrocercus urophasianus.

ARTICLE II - PURPOSE

Section 1

The purpose and objectives of the Prairie Grouse Technical Council (PGTC) shall be the encouragement of conservation and preservation of prairie grouse.

Section 2

It shall be the intention of the PGTC to advance for the public benefit, scientific research, management, protection, control, perpetuation and restoration of prairie grouse, either through its own efforts or in cooperation with any state or federal agency or private organization.

Section 3

It shall carry on educational programs designed to create interest in the preservation, perpetuation and restoration of prairie grouse.

Section 4

It shall encourage, promote and support a citizens not-for-profit organization formed to aid in the research and management of prairie grouse.

ARTICLE III - MEMBERSHIP

Section 1

Membership shall be open to anyone interested in prairie grouse.

Section 2

Membership fees of individuals and agencies shall be determined by the Executive Board.

ARTICLE IV - EXECUTIVE BOARD

Section 1

The executive board shall consist of a Chairperson and two members.

Section 2

The PGTC shall be governed by the Executive Board of the Chairperson and two members.

Section 3

The term of office for each member of the executive board shall be six years. The designated representative of the state hosting the biennial meeting of the PGTC shall serve as Chairperson for two years and remain as a member for four years.

Section 4

Vacancies in any unexpired term of office shall be filled by the Executive Board to serve until the next meeting of the PGTC.

ARTICLE V - NOMINATION OF BOARD

Section 1

Nomination of each board member is predetermined by the host state who selects their official representative who serves first as Chairperson, then member of the board.

Section 2

The Chairperson shall begin his or her term of office immediately following designation of the next host state.

ARTICLE VI - MEETINGS

Section 1

Special membership and Executive Board Meetings, Quorums, Notices, and Procedures shall be determined by the Executive Board.

Section 2

Business meetings, time, and place will be a matter of decision for the Executive Board.

ARTICLE VII - MANAGEMENT AND DUTIES

Section 1

The Executive Board shall manage the affairs of the PGTC in conformance with provisions of its Bylaws.

Section 2

The Chairperson shall have general supervision of the affairs of the PGTC. The Chairperson shall appoint necessary committees and preside at meetings of the PGTC and the Executive Board.

Section 3

In the absence of the Chairperson the duties shall be assumed by the preceding Chairperson; in the event neither can serve, the duties shall be delayed until the Executive Board can function.

Section 4

Standing committees shall be accountable to the Executive Board and under the general supervision of the Chairperson.

Section 5

The Chairperson shall appoint a secretary to record and transmit proceedings of the business sessions.

Section 6

The Chairperson shall prepare and submit financial statements to the membership and Executive Board.

ARTICLE VIII - FISCAL MANAGEMENT

Section 1

The PGTC shall be a not-for-profit, charitable, educational, scientific, research and agency-oriented organization. The PGTC shall have the power to solicit and disburse funds to achieve the purpose and objectives of the organization.

Section 2

The fiscal year shall run from October 1 to September 30.

ARTICLE IX - STANDING COMMITTEES

Section 1

The Chairperson shall have the power to appoint such committees for the duration of his or her term as may be required by the activities of the PGTC.

Section 2

The Chairperson shall appoint an Awards Committee which shall be made up of the Executive Board and two additional members. The Awards Committee will establish criteria and procedures by which, at most, two awards may be presented at each biennial meeting. One award to an individual(s) and a second to any group, organization, company or institution which has made an exemplary contribution to the welfare, knowledge or preservation of prairie grouse.

No award will be presented if a deserving recipient cannot be found in either category.

ARTICLE X - MEETINGS - ORDER OF BUSINESS

Section 1

Meetings shall be conducted in accordance with Robert's Rules of Order.

Section 2

The order of business at the biennual meeting shall be as follows:

1. reading of the minutes, financial report and communications
2. report of the Chairperson and Executive Board
3. report of committees
4. unfinished business
5. new business
6. other business
7. entertain invitations for next meeting
8. adjournment

Section 3

This order of business may be modified or dispensed with whenever necessary.

ARTICLE XI - BYLAWS AMENDMENT

Section 1

Bylaws may be adopted, amended, or repealed, at the biennual meeting by two-thirds of majority of those attending, provided such amendments have been submitted to the membership 30 days prior to the meeting.

ARTICLE XII - ADOPTION OF THESE BYLAWS

The foregoing bylaws were adopted by the members of the Prairie Grouse Technical Council at the General Meeting held in Crookston, Minnesota, on September 18, 1987.

ATTEST:

Daniel Svedarsky, Chairperson

Donald Christisen, Executive Committeeman

Roger Wells, Executive Committeeman

Executive Board 1985-1987
Daniel Svedarsky, Chairman
Donald M. Christisen, Member
Roger Wells, Member

Executive Board 1987-1989
Gregg Stoll, Chairman
Daniel Svedarsky, Member
Donald M. Christisen, Member

ATTENDANCE LIST

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