

LITERATURE CITED AND OTHER REFERENCES

- Aldrich, J. W. 1946. New subspecies of birds from western North America. *Proc. Biol. Soc. Wash.* 59: 129-136.
- Aldrich, J. W. 1963. Geographic orientation of North American Tetraonidae. *J. Wildl. Manage.* 27: 529-545.
- Aldrich, J. W., and A. J. Duvall. 1955. Distribution of American gallinaceous game birds. U.S. Dept. Inter., Fish and Wildl. Serv. Circular 34.
- American Ornithologist's Union. 1957. Check-list of North American Birds. 5th ed. Am. Ornithol. Union. Baltimore, MD.
- Andelt, W. F. 2003. Possible role of predators in the sage grouse decline. Final Report to Moffat County Department of Natural Resources – 14 July 2003. Department of Fishery and Wildlife Biology, Colorado State University, Fort Collins, Colorado, USA.
- Anderson, J. E., and K. E. Holte. 1981. Vegetation development over 25 years without grazing on sagebrush-dominated rangeland in southeastern Idaho. *Journal of Range Management* 34:25-29.
- Anderson, J. E., and R. S. Inouye. 2001. Landscape-scale changes in plant species abundance and biodiversity of a sagebrush steppe over 45 years. *Ecological Monographs* 71:531-536.
- Angelstam, P. 1986. Predation on ground-nesting birds' nests in relation to predator densities and habitat edge. *Oikos* 47: 365-373.
- Angelstam, P., E. Lindstrom, and P. Widen. 1984. Role of predation in short-term populations fluctuations of some birds and mammals in Fennoscandia. *Oecologia* 62: 199-208.
- Anonymous. 1947. Colorado Year Book 1945-1946. Colorado State Planning Commission. Bradford-Robinson Printing Company, Denver, CO.
- Apa, A. D. 1998. Habitat use and movements of sympatric sage and Columbian sharp-tailed grouse in southeastern Idaho. Dissertation, University of Idaho, Moscow, ID.
- Apa, A. D. Unpublished data. Colorado Division of Wildlife, Grand Junction, CO.
- Athearn, F. J. 1982. An isolated empire: a history of Northwest Colorado. 3rd ed. Colorado Bureau of Land Management.
- Autenrieth, R. E. 1981. Sage grouse management in Idaho. Department of Fish and Game, Wildlife Bulletin 9, Boise, ID.
- Babcock, H.R. 1990. History of the rural schools of Moffat County, Colorado. Moffat County Museum, Craig, Colorado. Earth Design Systems. Colorado Springs, Colorado.
- Barber, T. A. 1968. Function of the cecal microflora in Sage Grouse nutrition. M. S. Thesis, Colorado State University, Fort Collins, CO.
- Barnett, J. K. 1992. Diet and nutrition of female sage grouse during the pre-laying period. M. S. Thesis, Oregon State University, Corvallis, OR.
- Barnett, J. K., and J. A. Crawford. 1994. Pre-laying nutrition of sage grouse hens in Oregon. *Journal of Range Management* 47:114-118.
- Batterson, W. M. and W. B. Morse. 1948. Oregon sage grouse. Oregon Fauna Series 1. Oregon Game Commission, Portland, OR.

- Bean, R. W. 1941. Life history studies of the sage grouse (*Centrocercus urophasianus*) in Clark County, Idaho. B. S. Thesis. Utah State College, Logan, UT.
- Beaver, D.L. and J.J. Roth. 1997. Winter survey of raptors with notes on avian scavengers in northwestern Colorado. Great Basin Naturalist 57(2): 184-186.
- Beck, J. L. 2006. Summary of oil and gas development impacts on prairie grouse. Unpublished manuscript. Colorado Division of Wildlife. Grand Junction, Colorado.
- Beck, J. L., and D. L. Mitchell. 2000. Influences of livestock grazing on sage grouse habitat. Wildlife Society Bulletin 28:993-1002.
- Beck, T. D. I. 1975. Attributes of a wintering population of sage grouse, North Park, Colorado. Thesis, Colorado State University, Fort Collins, CO.
- Beck, T. D. I. 1977. Sage grouse flock characteristics and habitat selection during winter. Journal of Wildlife Management 41:18-26.
- Beck, T. D. I., and C. E. Braun. 1978. Weights of Colorado Sage Grouse. Condor 80:241-243.
- Beck, T.D., R.B. Gill, and C.E. Braun. 1975. Sex and age determination of sage grouse from wing characteristics. Game Information Leaflet No. 29. Colorado Division of Wildlife. Denver, Colorado.
- Beetle, A. A. 1960. A study of sagebrush: the section of Tridentatae of Artemisia: Agricultural Experiment Station, University of Wyoming, Bulletin 368.
- Bergerud, A. T. 1988. Population ecology of North American grouse. Pages 578-648 in A. T. Bergerud and M. W. Gratson, editors. Adaptive strategies and population ecology of northern grouse. University of Minnesota, Minneapolis, MN.
- Berry, J. D., and R. L. Eng. 1985. Interseasonal movements and fidelity to seasonal use areas by female sage grouse. Journal of Wildlife Management 49:237-240.
- Boisvert, J.H. 2002. Ecology of Columbian sharp-tailed grouse associated with Conservation Reserve Program and reclaimed surface mine lands in northwestern Colorado. M.S. Thesis, University of Idaho, Moscow, Idaho.
- Boisvert, J. H., R. W. Hoffman, and K. P. Reese. 2005. Home range and seasonal movements of Columbian Sharp-tailed Grouse associated with Conservation Reserve Program and mine reclamation. Western North American Naturalist 65:36-44.
- Boyce, M. S. 1990. The red queen visits sage grouse leks. American Zoologist 30:263-270.
- Boyle, S.A. and D.R. Reeder. 2005. Colorado sagebrush: a conservation assessment and strategy. Grand Junction: Colorado Division of Wildlife.
- Bradbury, J. W., R. M. Gibson, and I. M. Tsai. 1986. Hotspots and the evolution of leks. Animal Behavior 34:1694-1709.
- Bradbury, J. W., and R. M. Gibson. 1983. Leks and mate choice. Pages 109-138 in P. Bateson, editor. Mate Choice. Cambridge University Press, Cambridge.
- Bradbury, J. W., R. M. Gibson, C. E. McCarthy, and S. L. Vehrencamp. 1989a. Dispersion of displaying male sage grouse. II. The role of female dispersion. Behavioral Ecology and Sociobiology 24:15-24.
- Bradbury, J. W., S. L. Vehrencamp, and R. M. Gibson. 1989b. Dispersion of displaying male sage grouse. I. Patterns of temporal variation. Behavioral Ecology and Sociobiology 24: 1-14.

- Braun, C.E. 1981. Vulnerability and population characteristics of sage grouse in Moffat County. Fed. Wildl. Restor. Proj. W-37-R-34. Colo. Div. Wildl. Ft. Collins, Colorado.
- Braun, C. E. 1995. Distribution and status of sage grouse in Colorado. Prairie Naturalist 27:1-9.
- Braun, C. E. 1998. Sage grouse declines in Western North America: What are the problems? Proceedings of the Western Association of State Fish and Wildlife Agencies 78:139-156.
- Braun, C. E., and R. L. Hoffman. 1979. Vulnerability and population characteristics of sage grouse in Moffat County. Fed. Wildl. Restor. Proj. 37-R-32-R. Colo. Div. Wildl. Ft. Collins, Colorado.
- Braun, C. E., T. Britt, and R. O. Wallestad. 1977. Guidelines for maintenance of sage grouse habitats. Wildlife Society Bulletin 5:99-106.
- Braun, C. E., K. M. Giesen, R. M. Hoffman, T. E. Remington, and W. D. Snyder. 1994. Upland bird management analysis guide, 1994-1998. Colorado Div. Wildl., Denver. Div. Rep. 19.
- Bump, G., R. W. Darrau, F. C. Edminster, and W. F. Crissey. 1947. The ruffed grouse: life history-propagation-management. New York State Conservation Department 417-435.
- Burger, L.D., L.W. Burger, and J. Faaborg. 1994. Effects of prairie fragmentation on predation on artificial nests. Journal of Wildlife Management 58(2): 249-254.
- Burkhardt, J.W. 1996. Herbivory in the intermountain west: an overview of evolutionary history, historic cultural impacts and lessons from the past. University of Idaho Station Bulletin 58.
- Burkhardt, J. W., and E. W. Tisdale. 1969. Natural and successional status of western juniper vegetation in Idaho. Journal of Range Management 22: 264-270.
- Cassidy, K. M., and C. E. Grue. 2000. The role of private and public lands in conservation of at-risk vertebrates in Washington State. Wildlife Society Bulletin 28:1060-1076.
- Clifford, H. 2002. Can cows and grouse coexist on the range? High Country News 34 (2).
- Collins, C.P. 2004. Ecology of Columbian sharp-tailed grouse breeding in coal mine reclamation and native upland cover types in northwestern Colorado. M.S. Thesis. University of Idaho. Moscow, Idaho.
- Colorado Climate Center. 1984. Colorado Average Annual Precipitation Map, 1951-1980.
- Colorado Div. of Wildl. Unpublished data. Colorado Division of Wildlife, Denver, Colorado, USA.
- Colorado Division of Wildlife. 1980-1994. Small Game Hunting Brochures. Denver, Colorado, USA.
- Colorado Division of Wildlife. Colorado statewide greater sage-grouse conservation plan (CCP)—draft materials. Denver, Colorado.
- Colorado Division of Wildlife. Unpublished manuscript—sage grouse trapping and handling protocol.
- Connelly, J. W., Jr. 1982. An ecological study of sage grouse in southeastern Idaho. Dissertation, Washington State University, Pullman, WA
- Connelly, J. W., and C. E. Braun. 1997. Long-term changes in Sage Grouse *Centrocercus urophasianus* populations in western North America. Wildl. Biol. 3: 229-234.

- Connelly, J. W., and W .J. Markham. 1983. Movements and radionuclide concentrations of sage grouse in southeastern Idaho. *Journal of Wildlife Management* 47:169-177.
- Connelly, J. W., W. J. Arthur, and O. D. Markham. 1981. Sage grouse leks on recently disturbed sites. *Journal of Range Management* 52:153-154.
- Connelly, J. W., H. W. Browers, and R. J. Gates. 1988. Seasonal movements of sage grouse in southeastern Idaho. *Journal of Wildlife Management* 52:116-122.
- Connelly, J. W., W. L. Wakkinen, A. D. Apa, and K. P. Reese. 1991. Sage grouse use of nest sites in southeastern Idaho. *Journal of Wildlife Management* 55:521-524.
- Connelly, J. W., R. A. Fischer, A. D. Apa, K. P. Reese, and W. L. Wakkinen. 1993. Renesting of sage grouse in southeastern Idaho. *Condor* 95:1041-1043.
- Connelly, J. W., K. P. Reese, W. L. Wakkinen, M. D. Robertson, and R. A. Fischer. 1994. Sage grouse ecology. Study I: Sage grouse response to a controlled burn. Idaho Department of Fish and Game, Boise, ID.
- Connelly, J. W., M. A. Schroeder, A. R. Sands, and C. E. Braun. 2000. Guidelines to manage sage grouse populations and their habitats. *Wildlife Society Bulletin* 28:967-985.
- Connelly, J. W., S. T. Knick, M. A. Schroeder, and S. Stiver. 2004. Conservation assessment of greater sage-grouse and sagebrush habitats. Western Association of Fish and Wildlife Agencies. www.wafwa.org.
- Cote, I.M. and W.J.Sutherland. 1997. The effectiveness of removing predators to protect bird populations. *Conservation Biology* 11(2): 395-405.
- Crawford, J. A., R. A. Olson, N. E. West, J. C. Mosely, M. A. Schroeder, T. D. Whitson, R. F. Miller, M. A. Gregg, and C. S. Boyd. 2004. *Synthesis Paper: Ecology and management of sage-grouse and sage-grouse habitat*. *Journal of Range Management* 57:2-19.
- Crowe, D. M. 1986. Furbearers of Wyoming. Wy. Game and Fish Dept. Cheyenne, WY. 74 pp.
- Danvir, R. E. 2002. Sage-Grouse Ecology and Management in Northern Utah Sagebrush-Steppe: A Deseret Land and Livestock Wildlife Research Report. Deseret Land and Livestock Ranch and The Foundation for Quality Resource Management, Woodruff, Utah.
- Daubenmire, R. 1959. A canopy-coverage method of vegetational analysis. *Northwest Science* 33:43-64.
- Daubenmire, R. F. 1968. Plant communities: a textbook of plant synecology. Harper and Rowe, Publishers, New York, New York.
- Daubenmire, R. 1970. Steppe vegetation of Washington. *Washington Agricultural Experiment Station Technical Bulletin* 62. Pullman, Washington.
- Davis, L. 1980. A brief history of Craig and Moffat County up to 1920. Unpublished manuscript. Craig Public Library Reference Files. Craig, CO.
- DeLong, A. K., J. A. Crawford, and D. C. DeLong. 1995. Relationships between vegetational structure and predation of artificial Sage Grouse nests. *J. Wildl. Manage.* 59: 88-92 .
- Dingman, J. D. 1980. Characteristics of Sage Grouse leks, North Park, Colorado. M. S. Thesis, University of Denver, Denver, CO.
- Doherty, K. E., D. E. Naugle, B. L. Walker, and J. M. Graham. 2008. Greater sage-grouse winter habitat selection and energy development. *Journal of Wildlife Management* 72: 187-195.

- Drut, M. S. 1994. Status of sage grouse with emphasis on populations in Oregon and Washington. Audubon Society of Portland, Portland, OR.
- Drut, M. S., J. A. Crawford, and M. A. Gregg. 1994a. Brood habitat use by sage grouse in Oregon. *Great Basin Naturalist* 54:170-176.
- Drut, M. S., W. H. Pyle, and J. A. Crawford. 1994b. Diets and food selection of sage grouse chicks in Oregon. *Journal of Range Management* 47:90-93.
- Dunkle, S. W. 1977. Swainson's Hawks on the Laramie plains, Wyoming. *Auk* 102: 621-627.
- Dunn, P. O., and C. E. Braun. 1985. Natal dispersal and lek fidelity of sage grouse. *Auk* 102:621-627.
- Dunn, P. O., and C. E. Braun. 1986. Summer habitat use by adult female and juvenile sage grouse. *Journal of Wildlife Management* 50:228-235.
- Ellis, K. L. 1984. Behavior of lekking Sage Grouse in response to a perched golden eagle. *West. Birds* 15: 37-38.
- Eng, R.L. 1955. A method for obtaining sage grouse age and sex ratios from wings. *Journal of Wildlife Management* 19(2):267-272.
- Eng, R. L. 1963. Observations on the breeding biology of male sage grouse. *Journal of Wildlife Management* 27:841-846.
- Eng, R. L., and P. Schladweiler. 1972. Sage grouse winter movements and habitat use in central Montana. *J. Wildl. Manage.* 36:141-146.
- Finley, R.B. 1995. The spread of the raccoon (*Procyon lotor* hirtus) into the Colorado Plateau from the northern Great Plains. *Proceedings of the Denver Museum of Natural History. Series 3*, No. 11.
- Finley, R. B., Jr., D. E. Wilhelm, Jr., and W. Caire. 1976. Mammals of the Colorado oil shale region. Annual progress report. Natl. Fish Wildl. Lab., U.S. Fish Wildl. Serv., Ft. Collins, 49 pp.
- Fischer, R. A. 1994. The effects of prescribed fire on the ecology of migratory sage grouse in southeastern Idaho. Dissertation, University of Idaho, Moscow, ID.
- Fischer, R. A., A. D. Apa, and J. W. Connelly. 1993. Nesting area fidelity of sage grouse in southeastern Idaho. *Condor* 95:1038-1041.
- Fischer, R. A., K. P. Reese, and J. W. Connelly. 1996a. An investigation on fire effects within xeric sage grouse habitat. *Journal of Range Management* 49:194-198.
- Fischer, R. A., K. P. Reese, and J. W. Connelly. 1996b. Influence of vegetal moisture content and nest fate on timing of female sage grouse migration. *Condor* 98:868-872.
- Fischer, R. A., W. L. Wakkinen, K. P. Reese, and J. W. Connelly. 1997. Effects of prescribed fire on movements of female Sage Grouse from breeding to summer ranges. *Wilson Bulletin* 109:82-91.
- Fitzgerald, J. P., C. A. Meaney, and D. M. Armstrong. 1994. Mammals of Colorado. Denver Museum of Natural History, Denver, CO.
- Flinders, J. T. 1999. Restoration of sage grouse in Strawberry Valley, Utah, 1998-99 report. Utah Reclamation Mitigation and Conservation Commission, Progress Report. Brigham Young University, Provo, UT.

- Franklin, I. R. 1980. Evolutionary change in small populations. Pages 135-149 in M. E. Soulé and B. A. Wilcox, editors. *Conservation Biology*. Sinauer Associates, Inc., Sunderland, MA.
- Gates, R. J. 1983. Sage grouse, lagomorph, and pronghorn use of a sagebrush grassland burn site on the Idaho National Engineering Laboratory. Thesis, Montana State University, Bozeman, MT.
- Gates, R. J. 1985. Observations of the formation of a sage grouse lek. *Wilson Bulletin* 97:219-221.
- Gibson, R. M. 1992. Lek formation in sage grouse: the effect of female choice on male territory settlement. *Animal Behavior* 43:443-450.
- Gibson, R. M. 1996. A re-evaluation of hotspot settlement in lekking sage grouse. *Animal Behavior* 52:993-1005.
- Gibson, R. M., and J. W. Bradbury. 1985. Sexual selection in lekking Sage Grouse: phenotypic correlates of male mating success. *Behavioral and Ecological Sociobiology* 18:117-123.
- Gibson, R. M., and J. W. Bradbury. 1986. Male and female mating strategies on sage grouse leks. Pages 379-398 in D. I. Rubenstein and R. W. Wrangham, editors. *Ecological aspects of social evolution*. Princeton University Press, Princeton, NJ.
- Gibson, R. M., J. W. Bradbury, and S. L. Vehrencamp. 1991. Mate choice in lekking sage grouse revisited: the roles of vocal display, female site fidelity, and copying. *Behavioral Ecology* 2:165-180.
- Gibson, R. M., C. E. Taylor, and D. R. Jefferson. 1990. Lek formation by female choice: a simulation study. *Behavioral Ecology* 1:36-42.
- Giezentanner, K. I. and W. H. Clark. 1974. The use of western harvester ant mounds as strutting locations by Sage Grouse. *Condor* 76:218-219.
- Gill, R. B. 1965. Distribution and abundance of a population of Sage Grouse in North Park, Colorado. M. S. Thesis, Colorado State University, Fort Collins, CO.
- Girard, G. L. 1937. Life history, habits, and food of the sage grouse, *Centrocercus urophasianus* Bonaparte. *University of Wyoming Publications* 3:1-56.
- Gray, G. M. 1967. An ecological study of sage grouse broods with reference to nesting, movements, food habits, and sagebrush strip spraying in the Medicine Lodge drainage. Clark County, Idaho. M. S. Thesis. University of Idaho, Moscow, ID.
- Gregg, M. A. 1991. Use and selection of nesting habitat by sage grouse in Oregon. Thesis, Oregon State University, Corvallis, OR.
- Gregg, M. A., J. A. Crawford, M. S. Drut, and A. K. DeLong. 1994. Vegetational cover and predation of sage grouse nests in Oregon. *Journal of Wildlife Management* 58:162-166.
- Griner, L. A. 1939. A study of the sage grouse (*Centrocercus urophasianus*), with special reference to life history, habitat requirements, and numbers and distribution. M.S. Thesis, Utah State Agricultural College Library, Logan, UT.
- Good, R.E., R.M. Nelson, H.H. Sawyer, and L.L. McDonald. 2004. Population level survey of golden eagles (*Aquila chrysaetos*) in the western United States. Western EcoSystem Technologies, Inc. Cheyenne, WY. 63pp.
- Gunnison Sage Grouse Working Group. 1997. Gunnison sage grouse conservation plan. Gunnison Basin Colorado.

- Hanf, J. M., P. A. Schmidt, and E. B. Groshens. 1994. Sage grouse in the high desert of central Oregon: results of a study, 1988-1993. BLM/OR/WA/PT-95/002-4120.7, U.S. Department of Interior, Bureau of Land Management, Prineville, Oregon, USA.
- Hanna, W. C. 1936. Sage grouse breeding in California. Condor 38:38
- Harju, H. 1986. Why not have a longer season for sage grouse? Wyoming Wildlife Vol. XLX, No. 9, September 1986.
- Hartzler, J. E. 1972. An analysis of sage grouse lek behavior. Dissertation. University of Montana, Missoula, MT
- Hartzler, J. E., and D. A. Jenni. 1988. Mate choice by female sage grouse. Pages 240-269 in A. T. Bergerud and M. W. Gratson, editors. Adaptive strategies and population ecology of northern grouse. University of Minnesota Press, Minneapolis, MN.
- Hausleitner, D. 2003. Population dynamics, habitat use, and movements of greater sage-grouse in Moffat County, Colorado. M.S. Thesis. University of Idaho. Moscow, ID.
- Henke, S. E., and F. C. Bryant. 1999. Effects of coyote removal on the faunal community in western Texas. Journal of Wildlife Management 63: 1066-1081.
- Hironaka, M., M. A. Forsberg, and A. H. Winward. 1983. Sagebrush-grass habitat types of southern Idaho. Idaho Forest and Wildlife and Range Experiment Station, Bulletin 35, Moscow, ID.
- Hjorth, I. 1970. Reproductive behavior in Tetraonidae with special references to males. Viltrevy 7:381-587
- Hoffman, D. M. 1979. Investigations of the distribution and status of sagebrush and sage grouse in the Moffat County area. Colorado Division of Wildlife. Job Final Report, Project W-37-R-32, Game Bird Survey. Work Plan 3, Job 10. State of Colorado. Pages 95-161.
- Hoffman, R.W. and C.E. Braun. 1975. A volunteer wing collection station. Game Information Leaflet No. 101. Colorado Division of Wildlife. Denver, Colorado.
- Holloran, M. J. 2005. Greater sage-grouse (*Centrocercus urophasianus*) population response to natural gas field development in western Wyoming. PhD dissertation, Department of Zoology and Physiology, University of Wyoming, Laramie, Wyoming.
- Honess, R. F. 1947. Coccidiosis as a decimating factor among sage grouse. Fed. Aid Wildl. Restor. Proj. 33-R. Wyo. Game and Fish Comm. Cheyenne.
- Hulet, B. V. 1983. Selected responses of sage grouse to prescribed fire, predation, and grazing by domestic sheep in southeastern Idaho. Thesis, Brigham Young University, Provo, UT.
- Hupp, J. W. 1987. Sage grouse resource exploitation and endogenous reserves in Colorado. Dissertation., Colorado State University, Fort Collins, CO.
- Hupp, J. W., and C. E. Braun. 1989. Topographic distribution of sage grouse foraging in winter. Journal of Wildlife Management 53:823-829.
- Hupp, J. W. and C. E. Braun. 1991. Geographic variation among sage grouse in Colorado. Wilson Bulletin 103:255-261.
- Huwer, S.L. 2004. Evaluating greater sage-grouse brood habitat using human-imprinted chicks. M.S. Thesis. Colorado State University. Ft. Collins, CO. 85pp.
- Ingelfinger, F.M. 2001. The effects of natural gas development on sagebrush steppe passerines in Sublette County, Wyoming. MS thesis, Dept. of Zoology. U of Wyoming, Laramie, Wyoming.

- Johnson, G. D., and M. S. Boyce. 1990. Feeding trials with insects in the diet of sage grouse chicks. *Journal of Wildlife Management* 54:89-91.
- Johnson, L. L., and M. S. Boyce. 1991. Female choice of males with low parasite loads in sage grouse. Pages 377-388 in J. E. Loya and M. Zuk, editors. *Bird-Parasite interactions: ecology, evolution, and behaviour*. Oxford Ornithology Series, 2, Oxford University Press, Oxford.
- June, J. W. 1963. Wyoming sage grouse population measurement. *Proceedings of the Western Association of State Fish and Game and Fish Commissioners* 43:206-211.
- Kamler, J. F. and W. B. Ballard. Undated manuscript. Range expansion of red foxes in eastern Nevada and western Utah. Department of Range, Wildlife and Fisheries Management. Texas Tech University. Lubbock, Texas.
- Kamler, J. F. and W. B. Ballard. 2002. A review of native and nonnative red foxes in North America. *Wildlife Society Bulletin* 30: 370-379.
- Kamler, J. F., W. B. Ballard, R. F. Gilliland, P. R. Lemons, and K. Mote. 2003. Impacts of coyotes on swift foxes in northwestern Texas. *The Journal of Wildlife Management* 67: 317-323.
- Keister, G. P., and M. J. Willis. 1986. Habitat selection and success of sage grouse hens while nesting and brooding. Oregon Department of Fish and Wildlife, Progress Report W-87-R-2, Subproject 285, Portland, OR.
- Klebenow, D. A. 1969. Sage grouse nesting and brood habitat in Idaho. *Journal of Wildlife Management* 33:649-662.
- Klebenow, D. A. and G. M. Gray. 1968. Food habits of juvenile sage grouse. *Journal of Range Management* 20:206-213.
- Klott, J. H., and F. G. Lindzey. 1989. Comparison of sage and sharp-tailed grouse leks in south central Wyoming. *Great Basin Naturalist* 49:275-278.
- Klott, J. H., and F. G. Lindzey. 1990. Brood habitats of sympatric sage grouse and Columbian sharp-tailed grouse in Wyoming. *Journal of Wildlife Management* 54:84-88.
- Knick S. T., D. S. Dobkin, J. T. Rotenberry, M. A. Schroeder, W. M. Vander Haegen. 2003. Teetering on the edge or too late? Conservation and research issues for avifauna of sagebrush habitats. *The Condor*: Vol. 105, No. 4 pp. 611–634.
- Knight, R. L., G. N. Wallace, and W. E. Riebsame. 1995. Ranching the view: subdivisions versus agriculture. *Conservation Biology* 9(2): 459-461.
- Knight, R. L. and J. Kawashima. 1993. Responses of raven and red-tailed hawk populations to linear right-of-ways. *Journal of Wildlife Management* 57:266-271.
- Knowlton, G. F., and H. F. Thornely. 1942. Insect food of the sage grouse. *Journal of Economic Entomology* 35:107-108.
- Lande, R. 1995. Breeding plans for small populations based on the dynamics of quantitative genetic variance. Pages 318-341 in J. D. Ballou M. Gilpin, and T. Foose, editors. *Population management for survival and recovery: analytical methods and strategies in small population conservation*. Columbia University Press, New York, New York, USA.
- Leach, H. R., and B. M. Browning. 1958. A note on the food of sage grouse of the Madeline Plains area of California. *California Fish and Game* 44:73-76.

- Leach, H. R., and A. L. Hensley. 1954. The sage grouse in California, with special reference to food habits. *California Fish and Game* 40:385-394.
- Lumsden, G. H. 1968. The displays of the sage grouse. *Ontario Department of Lands and Forests, Toronto. Res. Rep.* 83.
- Lyon, A. G. 2000. The potential effects of natural gas development on sage grouse (*Centrocercus urophasianus*) near Pinedale, Wyoming. Thesis, University of Wyoming, Laramie, WY.
- Lyon, A. G., and S. H. Anderson. 2003. Potential gas development impacts on sage-grouse nest initiation and movement. *Wildlife Society Bulletin* 31(2): 486-491.
- Maestas, J. D., R. L. Knight, and W. C. Gilgert. 2003. Biodiversity across a rural land-use gradient. *Conservation Biology* 17:1425-1434.
- Marcstrom, V., and N. H. Hoaglund. 1980. Factors affecting reproduction of willow grouse (*Lagopus lagopus*) in two highland areas of Sweden. *Viltrevy* 11: 285-314.
- Marcstrom, V., Kenward, R.E., and E. Engren. 1988. The impact of predation on boreal tetraonids during vole cycles: an experimental study. *Journal of Animal Ecology* 57: 859-872.
- Martin, N. S. 1970. Sagebrush control related to habitat and sage grouse occurrence. *Journal of Wildlife Management* 34:313-320.
- Miller, R. F., T. J. Svejcar, and N. E. West. 1994. Implications of livestock grazing in the Intermountain Sagebrush Region: Plant composition. Pages 101-146 in M. Vavra, W.A. Laycock, and R.D. Piper, editors. *Ecological implications of livestock herbivory in the West*. Society for Range Management. Denver, CO.
- Miller, R. F., and L. E. Eddleman. 1997. Temporal and spatial changes of sage grouse *Centrocercus urophasianus* habitat in the sagebrush ecosystem. *Wildlife Biology* 3:273.
- Miller, R.F., and L.L. Eddleman. 2001. Spatial and temporal changes of sage grouse habitat in the sagebrush biome. Oregon State University Agricultural Experiment Station Technical Bulletin 151. 35 pp. Corvallis, Oregon, USA.
- Miller, R. F., and J. A. Rose. 1999. Fire history and western juniper encroachment in sagebrush steppe. *Journal of Range Management* 52:550-559.
- Miller, R. F., C. Baisan, J. A. Rose, and D. Pacioretti. 2001. Pre and post settlement fire regimes in mountain big sagebrush and aspen: The Northwest Great Basin. Final Report National Interagency Fire Center. <http://fresc.usgs.gov/products/papers/fr-nifc.pdf>
- Monsen, S. B. 2005. Restoration manual for Colorado sagebrush and associated shrubland communities. Colorado Division of Wildlife, Colorado, USA.
- Montgomery Watson. 2000. Yampa River Basin Small Reservoir Study-Phase 2. Steamboat Springs, Colorado.
- Moos, L. M. 1941. Sage hen eats grasshoppers. *Auk* 68:255.
- Myers, O. B. 1992. Sage grouse habitat enhancement: effects of sagebrush fertilization. Dissertation, Colorado State University, Fort Collins, CO.
- Myrberget, S. 1972. Fluctuations in a north Norwegian population of Willow Grouse. *Proc. Intern. Ornithol. Congr.* 15:107-120.

- Naugle, D. E., C. L. Aldridge, B. L. Walker, T. E. Cornish, B. J. Moynahan, M. J. Holloran, K. Brown, G. D. Johnson, E. T. Schmidtmann, R. T. Mayer, C. Y. Kato, M. R. Matchett, T. J. Christiansen, W. E. Cook, T. Creekmore, R. D. Falise, E. T. Rinkes, and M. S. Boyce. 2004. West Nile virus: pending crisis for greater sage-grouse. *Ecology Letters* 7:704-713.
- Naugle, D. E., B. L. Walker, and K. E. Doherty. 2006a. Sage-grouse population response to coal-bed natural gas development in the Powder River Basin: Interim progress report on region-wide lek-count analyses. Unpublished Report , Wildlife Biology Program, University of Montana, Missoula, Montana.
- Naugle, D. E., B. L. Walker, and K. E. Doherty. 2006b. Sage-grouse winter habitat selection and energy development ion the Powder Rive Basin: Completion Report. Unpublished Report, Wildlife Biology Program, University of Montana, Missoula, Montana.
- Nelson, O. C. 1955. A field study of Sage Grouse in southeastern Oregon with special reference to reproduction and survival. M.S. thesis, Oregon State Coll., Corvallis.
- Noss, R.F. and R.L. Peters. 1995. Endangered Ecosystems: A status report on America's vanishing habitat and wildlife. Defenders of Wildlife, Washington, D.C.
- Odell, E. A., and R. L. Knight. 2001. Songbird and medium-sized mammal communities associated with exurban development in Pitkin County, Colorado. *Conservation Biology* 15:1143-1152.
- Oyler-McCance, S.J., S.E. Taylor, and T.W. Quinn. 2005. A multilocus genetic survey of greater sage-grouse across their range. *Molecular Ecol.* 14:1293-1310.
- Paige, C., and S. A. Ritter. 1999. Birds in a sagebrush: managing sagebrush habitats for bird communities. Partners in Flight Western Working Group, Boise, Idaho.
- Palomares, F., P Gaona, P. Ferreras, and M. Delibes. 1995. Positive effects on game species of top predators by controlling smaller predator populations: an example with lynx, mongooses, and rabbits. *Conservation Biology* 9: 295-305.
- Patterson, R. L. 1952. The sage grouse in Wyoming. Sage Books Inc., Denver, CO.
- Petersen, B. E. 1980. Breeding and nesting ecology of female Sage Grouse in North Park, Colorado. M. S. thesis, Colorado State University, Fort Collins.
- Peterson, J. G. 1970. The food habits and summer distribution of juvenile sage grouse in central Montana. *Journal of Wildlife Management* 34:147-155.
- Peterson, J. G. 1995. Ecological implications of sagebrush manipulation: a literature review. Montana Fish, Wildlife and Parks, Helena, USA.
- Peterson, M. J., and N. J. Silvy. 1996. Reproductive stages limiting productivity of the endangered Attwater's prairie chicken. *Conservation Biology* 10: 1264-1276.
- Phillips, J. B. 1990. Lek behavior in birds: Do displaying males reduce nest predation? *Animal Behavior* 39:555-565.
- Piper, R.D. 1994. Ecological implications of livestock grazing. Pages 177-211 in M. Vavra, W.A. Laycock, and R.D. Piper, editors. *Ecological implications of livestock herbivory in the West*. Society for Range Management. Denver, CO.
- Pitman, J. C., C. A. Hagen, R. J. Robel, T. M. Loughin, and R. D. Applegate. 2005. Location and success of lesser prairie-chicken nests in relation to vegetation and human disturbance. *Journal of Wildlife Management* 69:1259-1269.

- Pyle, W. H., and J. A. Crawford. 1996. Availability of foods of sage grouse chicks following prescribed fire in sagebrush-bitterbrush. *Journal of Range Management* 49:320-324.
- Rasmussen, D. I., and L. A. Griner. 1938. Life history and management studies of the sage grouse in Utah, with special reference to nesting and feeding habits. *Transactions of the North American Wildlife Conference* 3:852-864.
- Reed, F., R. Roath, and D. Bradford. 1999. The grazing response index: a simple and effective method to evaluate grazing impacts. *Rangelands* 21(4): 3-7.
- Remington, T. E., and C. E. Braun. 1985. Sage grouse food selection in winter, North Park, Colorado. *Journal of Wildlife Management* 49:1055-1061.
- Remington, T. E., and C. E. Braun. 1988. Carcass composition and energy reserves of sage grouse during winter. *Condor* 90:15-19.
- Robel, R. J., T. J. Walker Jr., C. A. Hagen, R. K. Ridley, K. E. Kemp, and R. D. Applegate. 2003. Internal helminth parasites of lesser prairie-chicken *Tympanuchus pallidicinctus* in southwestern Kansas: incidence, burdens, and effects. *Wildlife Biology* 9: 341-349.
- Robel, R. J., J. A. Harrington, C. A. Hagen, J. C. Pitman, and R. R. Reker. 2004. Effect of energy development and human activity on the use of sand sagebrush habitat by lesser prairie-chickens in southwestern Kansas. *Transactions of the 69th North American Wildlife and Natural Resources Conference*.
- Robertson, J. H. 1971. Changes on grass-shrub range in Nevada ungrazed for 30 years. *Journal of Range Management* 24:397-400.
- Robertson, M. D. 1991. Winter ecology of migratory sage grouse and associated effects of prescribed fire in southeastern Idaho. Thesis, University of Idaho, Moscow, ID.
- Rogers, G. E. 1964. Sage grouse investigations in Colorado. Colorado Game, Fish and Parks Department, Technical Publication 16, Denver, CO.
- Rushton, S.P., M.D.F. Shirley, D.W. Macdonald, and J.C. Reynolds. 2006. Effects of culling fox populations at the landscape scale: a spatially explicit population modeling approach. *Journal of Wildlife Management* 70(4): 1102-1110.
- Sather-Blair, S., P. Makela, T. Carrigan, and L. Andeson. 2000. A framework to assist in making sensitive species habitat assessments for BLM-administered public lands in Idaho. U.S. Bureau of Land Management, Draft Document, Idaho State Office, Boise.
- Savage, D. E. 1968. The relationship of sage grouse to upland meadows in Nevada. M. S. thesis, University of Nevada, Reno, NV.
- Savage, D. E. 1969. Relation of sage grouse to upland meadows in Nevada. Nevada Fish and Game Commission, Job Completion Report, Project W-39-R-9, Job 12, Reno, NV.
- Schneider, J. W., and C. E. Braun. 1991. Movements and habitat use by sage grouse, Eagle County, Colorado, March-August 1991. Colorado Division of Wildlife, unpublished report, Fort Collins, CO.
- Schoenberg, T. J. 1982. Sage grouse movements and habitat selection in North Park, Colorado. Thesis, Colorado State University, Fort Collins, CO.
- Schroeder, M. A. 1995. Productivity and habitat use of sage grouse in north-central Washington. Washington Department of Fish and Wildlife, Job Progress Report Project W-96-R, Olympia, WA.

- Schroeder, M. A. 1997. Unusually high reproductive effort by sage grouse in a fragmented habitat in north-central Washington. *Condor* 99:933-941.
- Schroeder, M. A., J. R. Young, and C. E. Braun. 1999. Sage grouse (*Centrocercus urophasianus*). The birds of North America, No. 425. The Birds of North America, Philadelphia, PA.
- Schroeder, M. A. and R. K. Baydack. 2001. Predation and the management of prairie grouse. *Wildlife Society Bulletin* 29:24-32.
- Schroeder, M. A., C. L. Aldridge, A. D. Apa, J. R. Bohne, C. E. Braun, S. D. Bunnell, J. W. Connelly, P. A. Diebert, S. C. Gardner, M. A. Hilliard, G. D. Kobriger, S. M. McAdam, C. W. McCarthy, J. J. McCarthy, D. L. Mitchell, E. V. Rickerson, and S. J. Stiver. 2004. Distribution of Sage-Grouse in North America. *Condor* 106:363-376.
- Scott, J.W. 1940. The role of coccidian as parasites of wildlife. *Journal of the Colorado-Wyoming Academy of Sciences* 2(6).
- Scott, J.W. 1942. Mating behavior of the sage grouse. *Auk* 59:477-498.
- Slater, S.J. 2003. Sage-grouse (*Centrocercus urophasianus*) use of different-aged burns and the effects of coyote control in southwestern Wyoming. M.S. thesis. University of Wyoming. Laramie, Wyoming.
- Short, H.L. 1984. Habitat suitability index models: Brewer's sparrow. U.S. Fish and Wildlife Service FWS/OBS-82-10.83.
- Steenhoff, K., M.N. Kochert, and J.A. Roppe. 1993. Nesting by raptors and common ravens on electrical transmission line towers. *Journal of Wildlife Management* 57(2): 271-281.
- Soule, M. E. 1980. Conservation biology: an evolutionary-ecological perspective. Sinauer Associates, Sunderland, MA.
- Sveum, C. M. 1995. Habitat selection by Sage Grousehens during the breeding season in south-central Washington. M.S. thesis, Oregon State Univ., Corvallis.
- Sveum, C. M., W. D. Edge, and J. A. Crawford. 1998a. Nesting habitat selection by sage grouse in south-central Washington. *Journal of Range Management* 51: 265-269.
- Sveum, C. M., J. A. Crawford, and W. D. Edge. 1998b. Use and selection of brood-rearing habitat by sage grouse in south-central Washington. *Great Basin Naturalist* 58: 344-351.
- Swenson, J. E. 1986. Differential survival by sex in juvenile Sage Grouse and Gray Partridge. *Ornis Scand.* 17:14-17.
- Tate, J., Jr., M. S. Boyce, and T. R. Smith. 1979. Response of sage grouse to artificially created display ground. Pages 464-468 in G. A. Swanson, technical coordinator. The mitigation symposium: a national workshop on mitigating losses of fish and wildlife habitats. United States Department of Agriculture, Forest Service, General Technical Report RM-65, Fort Collins, CO.
- Tisdale, E. W., and M. Hironaka. 1981. The sagebrush-grass region: a review of the ecological literature. Idaho Forest, Wildlife, and Range Experiment Station, Bulletin 33, Moscow, ID.
- Torell, L.A., N. Rimbey, J. Tanaka, T. Darden, L. Van Tassell, and A. Harp. 2002. Ranch-level impacts of changing grazing policies on BLM land to protect the greater sage-grouse: evidence from Idaho, Nevada, and Oregon. PACWPL Policy Paper SG-01-02. Policy Analysis Center for Western Public Lands. University of Idaho. Caldwell, Idaho.

- Trueblood, W. R. 1954. The effect of grass reseeding in sagebrush lands on sage grouse populations. Thesis, Utah State Agricultural College, Logan, UT.
- Turrell, M. J., M. R. Sardelis, D. J. Dohm, and M. L. O'Gunn. 2001. Potential North American vectors of West Nile Virus. *Annals of the New York Academy of Sciences* 951: 317-324.
- USDI-BLM. 1987. Little Snake Resource Area Resource Management Plan.
- USDI-BLM – Unpublished data.
- USDI-BLM. 1999. White River Field Office Fire Management Plan.
- USDI-BLM. 2000. Little Snake Field Office Fire Management Plan.
- USDI-USFWS. 2003. Final PECE Policy. *Federal Register* Vol. 68, No. 60, 15100-15115.
- USDI-USFWS. 2005. Endangered and threatened wildlife and plants; 12-month finding for petitions to list the greater sage-grouse as threatened or endangered (January 12, 2005). *Federal Register* Vol. 70, 2244-2282.
- Vale, T. R. 1974. Sagebrush conversion projects: an element of contemporary environmental change in the western United States. *Biological Conservation* 6: 274-284.
- Vale, T. R. 1975. Presettlement vegetation in the sagebrush-grass areas of the Intermountain West. *Journal of Range Management*, 28: 32-36
- Vavra, M. 1992. Livestock and big game forage relationships. *Rangelands* 14:57-59.
- Vavra, M., W.A. Laycock, and R.D. Pieper, eds. 1994. Ecological implications of livestock herbivory in the west. Society for Range Management. Denver, Colorado.
- Wakkinen, W. L. 1990. Nest site characteristics and spring-summer movements of migratory sage grouse in southeastern Idaho. Thesis, University of Idaho, Moscow, ID.
- Wakkinen, W. L., K. P. Reese, and J. W. Connelly. 1992. Sage grouse nest locations in relation to leks. *Journal of Wildlife Management* 56:381-353.
- Walker, B. L., D. E. Naugle, and K. E. Doherty. 2007. Greater sage-grouse population response to energy development and habitat loss. *Journal of Wildlife Management* 71: 2644-2654.
- Wallestad, R. O. 1971. Summer movements and habitat use by sage grouse in central Montana. *Journal of Wildlife Management* 35:129-136.
- Wallestad, R. O. 1975. Life history and habitat requirements of sage grouse in central Montana. Montana Department of Fish, Game, and Parks, Helena, MT.
- Wallestad, R. O., and D. B. Pyrah. 1974. Breeding season movements and habitat selection of male sage grouse. *Journal of Wildlife Management* 38:630-633.
- Wallestad, R. O., and P. Schladweiler. 1974. Breeding season movements and habitat selection of male sage grouse. *Journal of Wildlife Management* 38:634-637.
- Wallestad, R. O., J. G. Peterson, and R. L. Eng. 1975. Foods of adult sage grouse in central Montana. *Journal of Wildlife Management* 39:628-630.
- Walsh, D. P., G. C. White, T. E. Remington, and D. C. Bowden. 2004. Evaluation of the lek count index for greater sage-grouse. *Wildlife Society Bulletin* 32:56-68.
- Welch, B. L., and C. Criddle. 2003. Countering misinformation concerning big sagebrush. Research Paper RMRS-RP-40: USFS Rocky Mountain Research Station.
- Welch, B. L., J. C. Pederson, and R. L. Rodriguez. 1988. Selection of big sagebrush by sage grouse. *Great Basin Naturalist* 48:274-279.

- Welch, B. L., F. J. Wagstaff, and J. A. Roberson. 1991. Preference of wintering sage grouse for big sagebrush. *Journal of Range Management* 44:462-465.
- Weber, W.A. and R.C. Wittmann. 2001. Colorado flora: western slope, 3rd. edition. University Press of Colorado. Boulder, Colorado.
- West, N.E. and J.A. Young. 2000. Vegetation of Intermountain valleys and lower mountain slopes. Pp 255-284 in M.A. Barbour and W.D. Billings (eds.). *North American terrestrial vegetation*, 2nd ed. Cambridge University Press. New York.
- West, N. E., F. D. Provenza, P. S. Johnson, and K. M. Owens. 1984. Vegetation change after 13 years of livestock grazing exclusion on sagebrush semi-arid desert in West Central Utah. *Journal of Range Management* 37:262-264.
- Wiley, R. H. 1970. Territoriality and non-random mating in sage grouse. *Centrocercus urophasianus*. Dissertation, Rockefeller University, New York, New York, USA.
- Wiley, R. H., Jr. 1973a. The strut display of male sage grouse: A "fixed" action pattern. *Behavior* 47:129-152.
- Wiley, R. H., Jr. 1973b. Territoriality and non-random mating in the sage grouse, *Centrocercus urophasianus*. *Animal Behavior Monographs* 6:87-169.
- Wiley, R.H. 1974. Evolution of social organization and life-history patterns among grouse. *Quarterly Rev. Biol.* 49:201-227.
- Wiley, R. H., Jr. 1978. The lek mating system of the sage grouse. *Scientific American* 238:114-125.
- Willis, F. 1919. Confidentially told. Unpublished typescript. The Colorado Historical Society Collection. Denver, CO.
- Winward, A. H. 1994. Sagebrush of Colorado: taxonomy, distribution, ecology & management. Colorado Division of Wildlife, Denver, Colorado.
- Wockner, G., R. Boone, N.T. Hobbs, and D. Freddy. 2005. The Habitat Assessment Model: a tool to improve wildlife habitat management. Colorado Division of Wildlife. Denver, CO. 52 pp.
- Yampa Valley Partners. 2000. Community indicators project: 2000-2001 report. Yampa Valley Partners. Craig, CO. <http://www.yampavalleypartners.com>.
- Yampa Valley Partners. 2005. Community indicators project: 2005-2006 report. Yampa Valley Partners. Craig, CO. <http://www.yampavalleypartners.com>.
- Yahner, R. H. 1988. Changes in wildlife Communities near edges. Richard H. Yahner. *Conservation Biology*, Vol. 2, No. 4, 333-339. Dec., 1988.
- Yahner, R. H., and D. P. Scott. 1988. Effects of forest fragmentation on depredation of artificial nests. *J. Wildl. Manage.* 52: 21-25.
- Yahner, R. H., T. E. Morrell, and J. S. Rachel. 1989. Effects of edge contrast on depredation of artificial avian nests. *J. Wildl. Manage.* 53:1135-1138.
- Yanishevsky, R., and S. Petring-Rupp. 1998. Management of breeding habitat for selected bird species in Colorado. Great Outdoors Colorado and Colorado Division of Wildlife, Denver, Colorado, USA.
- Young, J. A. 1994a. Changes in plant communities in the Great Basin induced by domestic livestock grazing. Pages 113-123 in K. T. Harper, L. L. St. Clair, K. H. Thorne, and W.

- M. Hess, editors Natural History of the Colorado Plateau and Great Basin. University Press of Colorado, Niwot.
- Young, J. A., R. E. Eckert, Jr., and R. A. Evans. 1979. Historical perspectives regarding the sagebrush ecosystem. Pages 1-13 in The sagebrush ecosystem: a symposium: Proceedings. Utah State University, College of Natural Resources, Logan, Utah, USA.
- Young, J. R. 1994.b. The influence of sexual selection on phenotypic and genetic divergence among Sage Grouse populations. Ph.D. diss., Purdue Univ., West Lafayette, IN.
- Young, J. R., C. E. Braun, S. J. Oyler-McCance, J. W. Hupp, and T. W. Quinn. 2000. A new species of sage-grouse (Phasianidae: *Centrocercus*) from southwestern Colorado. Wilson Bulletin 112: 445-453.
- Zablan, M.A. 1993. Evaluation of sage grouse banding program in North Park, Colorado. M. S. Thesis, Colorado State University, Fort Collins, CO.
- Zablan, M. A., C. E. Braun, and G. C. White. 2003. Estimation of greater sage-grouse survival in North Park, Colorado. Journal of Wildlife Management 67:144-154.

Appendix A:

Lek Counts

APPENDIX A: MANAGEMENT ZONE LEK COUNT DATA

MANAGEMENT ZONE 1																
LEK NAME	HCM1960	HCM1961	HCM1962	HCM1963	HCM1964	HCM1965	HCM1966	HCM1967	HCM1968	HCM1969	HCM1970	HCM1971	HCM1972	HCM1973	HCM1974	HCM1975
Beaver Basin #1	43		0	0	0	0	0	0	0	142	0	0	75			
Beaver Basin #2																
Beaver Creek																
Big Joe Basin																
Cold Springs	4															
Coyote Springs																
Gee Flats North																
Gee Flats South																
Goodman Draw													20			
Sugar Loaf																
Summit Spring																
Sweede Flat																
Swinging Bridge																
Whiskey Draw																
Total # of males	47	0	142	0	0	95	0	0	0							
Total # of active leks	2	0	1	0	0	2	0	0	0							
Average # males per lek	23.5									142.0			47.5			

MANAGEMENT ZONE 1																
LEK NAME	HCM1976	HCM1977	HCM1978	HCM1979	HCM1980	HCM1981	HCM1982	HCM1983	HCM1984	HMC1985	HCM1986	HCM1987	HCM1988	HCM1989	HCM1990	HCM1991
Beaver Basin #1		101	153		46	36	39	39	29	33	20	18	37	32	48	44
Beaver Basin #2												999	999	999	999	
Beaver Creek																
Big Joe Basin										5	0	5	0	0	0	0
Cold Springs								5		20	43	39	48	33	22	17
Coyote Springs																
Gee Flats North																
Gee Flats South																
Goodman Draw		13	42			8	0	0		0	0	0	0	3	1	
Sugar Loaf							26	14	16	22	22	24	17	15	23	
Summit Spring		19	18			12	0	0	0	0	2	0	0	18	0	10
Sweede Flat							21		0	0	0	0	0	0	0	
Swinging Bridge											0			0		
Whiskey Draw							20	0	16	19	11	18	18	12	17	
Total # of males	0	133	213	0	46	56	39	111	43	90	106	95	127	118	100	112
Total # of active leks	0	3	3	0	1	3	1	5	2	5	5	6	5	6	6	
Average # males per lek	44.3	71.0		46.0	18.7	39.0	22.2	21.5	18.0	21.2	15.8	25.4	19.7	16.7	18.7	

MANAGEMENT ZONE 1														
LEK NAME	HCM1992	HCM1993	HCM1994	HCM1995	HCM1996	HCM1997	HCM1998	HCM1999	HCM2000	HCM2001	HCM2002	HCM2003	HCM2004	HCM2005
Beaver Basin #1	56	61	36	28	33	46	39	51	36	29	54	64	79	50
Beaver Basin #2							0	0	0	0	0	0	0	49
Beaver Creek							7	2	2	0	0	0	0	
Big Joe Basin	0	0	0	0	0		5	8	6	0	1	0	0	
Cold Springs	27	13	9	11	45	50	45	65	44	29	25	22	37	34
Coyote Springs							1	12	6	0	1	0	0	0
Gee Flats North	22	43	24	18	15	29	35	34	26	34	13	22	21	34
Gee Flats South	0	4	1	0	0									
Goodman Draw	7	0	1	2	0	0	0	2	4	4	0	0	0	
Sugar Loaf	8	8	19	11	7	6	4	10	6	6	0	0	0	0
Summit Spring	5	2	9	6	1	0	0	6	8	2	1	5	0	0
Sweede Flat	0	0	0	0	0		0	2	0	0	0	0	3	0
Swinging Bridge			0				5	7	5	0	0	0	7	
Whiskey Draw	18	38	73	32	31	37	36	42	22	29	22	17	23	35
Total # of males	143	169	172	108	132	168	177	241	165	133	117	137	163	202
Total # of active leks	7	7	8	7	6	5	9	12	11	7	7	6	5	5
Average # males per lek	20.4	24.1	21.5	15.4	22.0	33.6	19.7	20.1	15.0	19.0	16.7	22.8	32.6	40.4

MANAGEMENT ZONE 2																
LEK NAME	HCM1960	HCM1961	HCM1962	HCM1963	HCM1964	HCM1965	HCM1966	HCM1967	HCM1968	HCM1969	HCM1970	HCM1971	HCM1972	HCM1973	HCM1974	HCM1975
Coffee Pot Spring																
Dugout Rim																
East Sand Wash																
Powder Wash #1																
Powder Wash Hill																
Racetrack Flat																
Sandwash Ridge Road	20		0	23	0	0	0	0	63	0	33	0	8			
Sandwash Road			0	0	0	0	0	18	0	43	33	42	34			
Snake River West													6			
Twin Buttes																
Total # of males	20	0	0	23	0	0	0	18	63	43	66	42	48	0	0	0
Total # of active leks	1	0	0	1	0	0	0	1	1	1	2	1	3	0	0	0
Average # male per lek	20.0			23.0					18.0	63.0	43.0	33.0	42.0	16.0		

MANAGEMENT ZONE 2																
LEK NAME	HCM1976	HCM1977	HCM1978	HCM1979	HCM1980	HCM1981	HCM1982	HCM1983	HCM1984	HMC1985	HCM1986	HCM1987	HCM1988	HCM1989	HCM1990	HCM1991
Coffee Pot Spring		26	29	24							0	20				
Dugout Rim												0				
East Sand Wash			28	29												
Powder Wash #1												15				
Powder Wash Hill		55	69	76							0	0				
Racetrack Flat																
Sandwash Ridge Road																
Sandwash Road																
Snake River West		12	8	23												24
Twin Buttes																
Total # of males	0	93	134	152	0	35	0	0	24							
Total # of active leks	0	3	4	4	0	2	0	0	1							
Average # male per lek		31.0	33.5	38.0								17.5			24.0	

MANAGEMENT ZONE 2															
LEK NAME	HCM1992	HCM1993	HCM1994	HCM1995	HCM1996	HCM1997	HCM1998	HCM1999	HCM2000	HCM2001	HCM2002	HCM2003	HCM2004	HCM2005	
Coffee Pot Spring			18				0	0	13	8	11	14	0	0	
Dugout Rim							0	2	20	0	0	0	0	0	
East Sand Wash			0				0	0	0	0	0	0	0	0	
Powder Wash #1							0	0	3	0	0	0	0	0	
Powder Wash Hill			14				35	29	0	7	11	8	4	16	
Racetrack Flat													5	20	
Sandwash Ridge Road							23	9	0	22	3	13	6		
Sandwash Road															
Snake River West			18				6	14	5	1	0	2	0	0	
Twin Buttes															0
Total # of males	0	0	50	0	0	0	64	54	41	38	25	37	15	36	
Total # of active leks	0	0	3	0	0	0	3	4	4	4	3	4	3	2	
Average # male per lek			16.7				21.3	13.5	10.3	9.5	8.3	9.3	5.0	18.0	

MANAGEMENT ZONE 3a	HCM1958	HCM1959	HCM1960	HCM1961	HCM1962	HCM1963	HCM1964	HCM1965	HCM1966	HCM1967	HCM1968	HCM1969	HCM1970	HCM1971	HCM1972	HCM1973
LEK NAME																
21 Road (21 Rd/Little Snake)																
Flowing Well #1																
Flowing Well #2																
Greasewood Gulch #1	21	78			0	41	19	59	0	57	60	0	3	0	0	
Greasewood Gulch #1 (old)																
Greasewood Gulch #2																
Greasewood Gulch #3																
Hardgrove Rim																
Kelly Spring																
Little Snake																
Mayberry OP																
MCR19 Brush Beat																
MCR69																
Mud Spring																
Pipeline																
Red Wash Hill																
Sand Creek																
Sevenmile Reservoir																
Shaffer's Draw Ridge/Oilpad																
Spring Creek #1 (new)																
Spring Creek #1 (old)	24				0	44	27	27	33	36	20	30	70	0	33	
Spring Creek #2	3				0	12	3	0	0	0	0	0	0	0	0	
Spring Creek #3																
Spring Creek Burn																
Upper 19 Road A					71	38	45	32	49	77	77	26	131	72	0	
Upper 19 Road B																
Total # of males	48	78	0	0	71	135	94	118	82	170	157	56	204	72	33	0
Total # of active leks	3	1	0	0	1	4	4	3	2	3	3	2	3	1	1	0
Average # male per lek	16.0	78.0			71.0	33.8	23.5	39.3	41.0	56.7	52.3	28.0	68.0	72.0	33.0	

MANAGEMENT ZONE 3a																
LEK NAME	HCM1974	HCM1975	HCM1976	HCM1977	HCM1978	HCM1979	HCM1980	HCM1981	HCM1982	HCM1983	HCM1984	HMC1985	HCM1986	HCM1987	HCM1988	HCM1989
21 Road (21 Rd/Little Snake)						26										
Flowing Well #1																
Flowing Well #2																
Greasewood Gulch #1				52	20	27			0	0			999			
Greasewood Gulch #1 (old)																
Greasewood Gulch #2													999			
Greasewood Gulch #3																
Hardgrove Rim														999	999	
Kelly Spring																
Little Snake																
Mayberry OP																
MCR19 Brush Beat																
MCR69																
Mud Spring													75	999		
Pipeline													999		999	
Red Wash Hill													999	10		
Sand Creek						45			24	41			999	0	0	
Sevenmile Reservoir				14	7	5										
Shaffer's Draw Ridge/Oilpad																
Spring Creek #1 (new)																
Spring Creek #1 (old)				24	24	46							999	0		
Spring Creek #2				31	42	20							999			
Spring Creek #3				16	12	11								0		
Spring Creek Burn																
Upper 19 Road A													0	10		
Upper 19 Road B													0			
Total # of males	0	0	0	137	105	180	0	0	24	41	0	0	0	0	95	0
Total # of active leks	0	0	0	5	5	7	0	0	1	1	0	0	0	7	4	3
Average # male per lek				27.4	21.0	25.7			24.0	41.0			0.0	23.8	0.0	

MANAGEMENT ZONE 3a																
LEK NAME	HCM1990	HCM1991	HCM1992	HCM1993	HCM1994	HCM1995	HCM1996	HCM1997	HCM1998	HCM1999	HCM2000	HCM2001	HCM2002	HCM2003	HCM2004	HCM2005
21 Road (21 Rd/Little Snake)	0				8	10	10		9	5	109	49	26	29	21	87
Flowing Well #1											32	28	70	80	63	33
Flowing Well #2											94	73	0	0		68
Greasewood Gulch #1					0					67	89	73	49	55	56	29
Greasewood Gulch #1 (old)					0				3							
Greasewood Gulch #2									39	0		0	13	6		0
Greasewood Gulch #3											43	62	67	39		79
Hardgrove Rim	999								0	0	0	0	0	0		12
Kelly Spring											41	43	87	66	63	98
Little Snake																
Mayberry OP																2
MCR19 Brush Beat	0								34	0	8	0	0	22	29	63
MCR69	0			0	0				34		31			2	55	93
Mud Spring	999								0	24	0	0	0	0		47
Pipeline	999								0	0	0	0				
Red Wash Hill	0								34	0	46	40	20		31	60
Sand Creek	0				0	1	0		27	14	25	11	8	4	2	4
Sevenmile Reservoir					0	0			0	0	0	0	0	32	0	0
Shaffer's Draw Ridge/Oilpad									31	57	52	48	27	19	9	28
Spring Creek #1 (new)					2	0	16	37	36	38	43	31	23	24	30	42
Spring Creek #1 (old)					0											
Spring Creek #2					6	6	5	5	11	16	15	18	15	15	16	35
Spring Creek #3	0					0			0	1	0	27	44	31	0	0
Spring Creek Burn																45
Upper 19 Road A																
Upper 19 Road B																
Total # of males	0	0	0	0	16	17	31	42	258	222	628	503	449	424	375	825
Total # of active leks	3	0	0	0	3	3	3	2	10	8	13	12	12	14	11	17
Average # male per lek	0.0				5.3	5.7	10.3	21.0	25.8	27.8	48.3	41.9	37.4	30.3	34.1	48.5

MANAGEMENT ZONE 3b																		
LEK NAME	HCM1953	HCM1954	HCM1955	HCM1956	HCM1957	HCM1958	HCM1959	HCM1960	HCM1961	HCM1962	HCM1963	HCM1964	HCM1965	HCM1966	HCM1967	HCM1968	HCM1969	HCM1970
99 Road																		
April Fools																		
Big Hole Butte A																		
Big Hole Butte B																		
Big Hole Gulch						4			37	0	16	5	0	12	0	0	0	0
Bighole Homestead																		
Conway Spring																		
Cowboy Reservoir																		
Dressler Gulch #3																		
Dry Gulch 1																		
Dry Gulch 2																		
Evans #1																		
Evans #2																		
Fan Tail																		
Finney's Dry Gulch																		
Forshee's (Timberlake #1)																		
Four Mile Creek #1																		
Four Mile Creek #2																		
Four Mile Creek #3																		
Gledhill Draw #1																		
Gledhill Draw #2																		
Great Divide					13	41			31	27	14	3	0	0	0	0	0	0
Great Divide #1					13	41			31	27	14	3	0	0	0	0	0	0
Great Divide #2																		
Great Divide #3																		
Jordan #1																		
Jordan #2																		
Lester Cox Ranch #1						34	44		34	0	14	5	8	8	12	42	0	0
Lester Cox Ranch #2																		
Martin #1																		
Martin #2																		
Monasco #1																		
Monasco #2																		
Mud Springs Draw																		
Pole Gulch																		
Scandinavian Gulch																		
Serviceberry																		
Thornburg Gulch																		
Timberlake #1	26	26				15				0	4	0	0	0	0	0	158	46
Timberlake #2A																	190	24
Timberlake #2B																	190	24
Timberlake #3																		131
Timberlake #4																		
Timberlake #5																		
West Timberlake #1																		
West Timberlake #2																		
Total # of males	26	26	0	0	0	79	126	0	133	54	62	16	8	20	12	42	538	225
Total # of active leks	1	1	0	0	0	5	3	0	4	2	5	4	1	2	1	1	3	4
Average # male per lek	26	26				16	42		33	27	12	4	8	10	12	42	179	56

MANAGEMENT ZONE 3b																		
LEK NAME	HCM1971	HCM1972	HCM1973	HCM1974	HCM1975	HCM1976	HCM1977	HCM1978	HCM1979	HCM1980	HCM1981	HCM1982	HCM1983	HCM1984	HMC1985	HCM1986	HCM1987	HCM1988
99 Road																		
April Fools																		
Big Hole Butte A							34	37	61								0	4
Big Hole Butte B							34	37	61							0	0	4
Big Hole Gulch	0	0															0	
Bighole Homestead																999	21	
Conway Spring																		
Cowboy Reservoir								11	18			10	0			0	0	
Dressler Gulch #3																		
Dry Gulch 1																		
Dry Gulch 2																		
Evans #1																		
Evans #2																		
Fan Tail																		
Finney's Dry Gulch																		
Forshee's (Timberlake #1)																0	0	
Four Mile Creek #1							34	36	46			5	38			999	15	
Four Mile Creek #2							27	18	85						5	999		
Four Mile Creek #3							40	136	128						36	25		
Gledhill Draw #1															999	22		
Gledhill Draw #2															999	10		
Great Divide	0	0														0		
Great Divide #1	0	0														0		
Great Divide #2																		
Great Divide #3																		
Jordan #1															999	21		
Jordan #2																		
Lester Cox Ranch #1	0	0					16	20	23						0	16		
Lester Cox Ranch #2															0	0		
Martin #1																		
Martin #2																		
Monasco #1																		
Monasco #2																		
Mud Springs Draw								76	93			999	20			45		
Pole Gulch							37	87	99						45	29		
Scandinavian Gulch							45	42	68									
Serviceberry																		
Thornburg Gulch								17	40									
Timberlake #1	57	89					55	53	55			0	0			0	0	
Timberlake #2A	29	37					43	66	104						11	0		
Timberlake #2B	29	37					43	66	104						11	0		
Timberlake #3	0						21	20	108			0	0		0	0		
Timberlake #4								43				4	0		40	5		
Timberlake #5																		
West Timberlake #1							5	3	1			0	0			0	0	
West Timberlake #2							47	111				0	0					
Total # of males	115	163	0	0	0	0	434	772	1248	0	0	19	58	0	0	0	148	217
Total # of active leks	3	3	0	0	0	0	13	17	18	0	0	4	2	0	0	0	11	13
Average # male per lek	38	54					33	45	69			5	29				13	17

MANAGEMENT ZONE 3b		HCM1989	HCM1990	HCM1991	HCM1992	HCM1993	HCM1994	HCM1995	HCM1996	HCM1997	HCM1998	HCM1999	HCM2000	HCM2001	HCM2002	HCM2003	HCM2004	HCM2005
LEK NAME																		
99 Road																		
April Fools															10	8	8	
Big Hole Butte A											0	0	0	5	0	0	0	
Big Hole Butte B											0	0	0	0	0	0	0	
Big Hole Gulch		999					0				0	0	10	6	0	26	0	
Bighole Homestead											0	0	0	0	12	7	6	
Conway Spring															23	18	13	
Cowboy Reservoir		0	0	0	0	0	0				0	0	0	0	0	0	0	
Dressler Gulch #3		21		999	999		0				0	0	0	0	0	25	74	
Dry Gulch 1															15	17	16	
Dry Gulch 2															6	6	18	
Evans #1															46	59	48	
Evans #2															5		4	
Fan Tail															31	13	9	
Finney's Dry Gulch															0		18	
Forshee's (Timberlake #1)		0	0	0			0	6	18	26	27	0	0	0	0	0		
Four Mile Creek #1		15	56	0	999	0	0	0			0	9	0	0	0	3	0	
Four Mile Creek #2		48	22	999	999	999	999	10	9	16	6	6	8	6	8	7	1	
Four Mile Creek #3		40	94	0	999		6	8	6	5	18	8	4	9	11	19	31	
Gleddhill Draw #1		25	16	999	999	999	0	18	14	20	18	23	43	40	0	0	22	
Gleddhill Draw #2		38	5	999	999	999	2	0	0	0	0	0	0	0	0	0	0	
Great Divide											0	0	0	0	0	0	0	
Great Divide #1											0	0	0	0	0	0	0	
Great Divide #2											0	0	0	0	0	0	0	
Great Divide #3											0	0	0	0	0	0	0	
Jordan #1		10	29	999	999	999	4	999	0	0	0	0	0	24	6	42	41	
Jordan #2		32	22	999	999	999	21		0	0	0	0	0	12	24	2	1	
Lester Cox Ranch #1							0				0	0	0	0	0	0	0	
Lester Cox Ranch #2											0	0	3	0	0	0	0	
Martin #1														25	44	66	44	
Martin #2														19	13		11	
Monasco #1														82	96	91	78	
Monasco #2														21			7	
Mud Springs Draw		1	999	999	999	999	13	14	19	29	24	15	32	25	41	68	66	
Pole Gulch		50	18	999	999	999	7	16	13	15	16	25	34	68	63	66	61	
Scandinavian Gulch							0	0	0	0	0	0	30	33	81	36	33	
Serviceberry																	10	
Thornburg Gulch							10	16	16	7	38	48	44	34	24	33	22	
Timberlake #1		35	0	0	0	0	0											
Timberlake #2A		25	15	999	999	999	6	1	0	0	0	0	28	0	0	0	50	
Timberlake #2B		25	15	999	999	999	6				0	0	0	0	0	0	33	
Timberlake #3		0	0	0	0	0	0	999	0	0	0	0	24	0	0	1	0	
Timberlake #4		45	29	999	999	999	27	21	20	11	29	46	31	46	38	37	28	
Timberlake #5																		
West Timberlake #1		0	0	0	0	0	0			0	0	0	32	69	0	0	0	
West Timberlake #2		55	45	0		15	12	10	0	19	18	34	67	90		58	87	
Total # of males		465	366	0	0	117	122	125	129	195	250	385	687	741	651	604	731	
Total # of active leks		16	13	11	13	10	12	12	9	8	9	11	16	22	21	20	24	
Average # male per lek		29	28	0	0	10	10	14	16	22	23	24	31	35	33	30	30	

MANAGEMENT ZONE 3c																			
LEK NAME		HCM1953	HCM1954	HCM1955	HCM1956	HCM1957	HCM1958	HCM1959	HCM1960	HCM1961	HCM1962	HCM1963	HCM1964	HCM1965	HCM1966	HCM1967	HCM1968	HCM1969	HCM1970
Antelope #1							4	3		3	0	0	0	0	9	0	40	0	0
Big Gulch #1	28	19					11	25		39	47	10	6	6	17	27	25	37	29
Big Gulch #2	74	19					7	6		0	0	0	0	0	0	0	63	57	50
Big Gulch #3A		32					50	32		82	37	16	23	26	28	48	83	72	20
Big Gulch #3B																			
Blue Gravel #1																			
Blue Gravel #2 (old)																			
Blue Gravel #3																			
Blue Gravel #4																			
Bord Gulch #1							33	34		4	70	39	29	27	32	41	37	10	4
Bord Gulch #2																			
Cottonwood Gulch																			
Dressler Gulch #1																			
Dressler Gulch #1A																			
Dressler Gulch #1B																			
Dressler Gulch #2																			
Dressler Gulch #4																			
Ellgen's																			
Grassie Reservoir							27			31	160	30	29	26	50	89	70	65	19
Horse Gulch																			
Lay Creek #1								55		0	91	38	33	28	45	78	59	167	51
Lay Creek #2																			
North Fork Big Gulch #1	23						17				0	16	7	5	18	17			
North Fork Big Gulch #2							48	70	67	57	11	0	1	0					
Round Bottom	45	34					6			27	44	21	23	34	35	6	29	31	67
Tom's Knob																			
Total # of males	147	127	0	0	0	203	225	67	243	460	170	151	152	234	306	406	439	240	
Total # of active leks	3	5	0	0	0	9	7	1	7	7	7	8	7	8	7	8	7	7	
Average # male per lek	49	25				23	32	67	35	66	24	19	22	29	44	51	63	34	

MANAGEMENT ZONE 3c																		
LEK NAME	HCM1971	HCM1972	HCM1973	HCM1974	HCM1975	HCM1976	HCM1977	HCM1978	HCM1979	HCM1980	HCM1981	HCM1982	HCM1983	HCM1984	HMC1985	HCM1986	HCM1987	HCM1988
Antelope #1	0	0																0
Big Gulch #1	0	9															0	0
Big Gulch #2	3	9										0	0				0	0
Big Gulch #3A	24	12							8			0	0				5	0
Big Gulch #3B																	5	28
Blue Gravel #1												20	0				0	0
Blue Gravel #2 (old)												15	0				35	22
Blue Gravel #3																		
Blue Gravel #4																		
Bord Gulch #1	44	37					23	37	42			0	0					
Bord Gulch #2																		
Cottonwood Gulch							8	38	17				15			0	0	
Dressler Gulch #1																		
Dressler Gulch #1A							27	25	33			2	5			999	2	
Dressler Gulch #1B																999	10	
Dressler Gulch #2									18			0	0				18	16
Dressler Gulch #4																		
Ellgen's																		
Grassie Reservoir	36	0					6	22	34			18	25			26	33	
Horse Gulch							4	35				10	0			999	999	
Lay Creek #1	67	80					34	57	125			0	15			999		
Lay Creek #2																999		
North Fork Big Gulch #1																0	0	
North Fork Big Gulch #2							22	37	76			0	0			0	13	
Round Bottom	61	27					36	50	43							999	53	
Tom's Knob																		
Total # of males	235	174	0	0	0	0	160	301	396	0	0	65	60	0	0	0	89	177
Total # of active leks	6	6	0	0	0	0	8	8	9	0	0	5	4	0	0	0	11	9
Average # male per lek	39	29						20	38	44		13	15			8	20	

MANAGEMENT ZONE 3c	HCM1989	HCM1990	HCM1991	HCM1992	HCM1993	HCM1994	HCM1995	HCM1996	HCM1997	HCM1998	HCM1999	HCM2000	HCM2001	HCM2002	HCM2003	HCM2004	HCM2005
Antelope #1	0	0	0	0	0				0	0	0	0	0	0	0	0	
Big Gulch #1	0	0	0	0	0			0	0	0	0	0	0	0	0	0	0
Big Gulch #2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Big Gulch #3A	0	0	0	0	0	7	7	7	1	0	0	0	0	0	0	0	0
Big Gulch #3B	79	999	28	21	32	9				0	0	0	0	0	0	0	
Blue Gravel #1	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22	0
Blue Gravel #2 (old)	50	999	999	999	999	999	999	0	0								
Blue Gravel #3										4	7		0		0	0	0
Blue Gravel #4										0	0	16	28	25	0	22	65
Bord Gulch #1		0				0	0			0	0	0	0	0	0	0	0
Bord Gulch #2		0				0	0			0	0	0	0	26	0	0	
Cottonwood Gulch	40					999	15	7	7	8	6		0	0	0	0	
Dressler Gulch #1						0		0	0	0					15	13	
Dressler Gulch #1A	0	0	0			0				0	0	2	0	33	5		
Dressler Gulch #1B	0	999	0	0	0					0	0	0	0	0	0	0	
Dressler Gulch #2	0	0	0	0	0	0		0	0	0	0	18	33	22	17	0	
Dressler Gulch #4	15	999	999		0	9	8	999	0	0	0	0	0		20	24	
Elgen's																	
Grassie Reservoir	40	0	0	21	0	0		0	0	0	0	0	0	0	0	0	0
Horse Gulch	68	73	48			0			0	0	0	0	0	0	0	0	0
Lay Creek #1	999	0				999	999	21	60	999	0	56	81	86	91	86	
Lay Creek #2	999	0				999				0	0	0	0	0	0	0	8
North Fork Big Gulch #1	0	0	0		0			0	0	0	0	0	0	0	0	0	0
North Fork Big Gulch #2	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0
Round Bottom	77	69	40	36		0					0	0	0	0	0	0	
Tom's Knob										0	13	18	0	0	0	0	0
Total # of males	364	157	116	78	32	16	31	43	68	12	26	110	142	192	155	155	78
Total # of active leks	9	6	5	5	2	6	5	4	4	3	3	5	3	5	5	2	
Average # male per lek	40	26	23	16	16	3	6	11	17	4	9	22	47	38	31	31	39

MANAGEMENT ZONE 4a		HCM1969	HCM1970	HCM1971	HCM1972	HCM1973	HCM1974	HCM1975	HCM1976	HCM1977	HCM1978	HCM1979	HCM1980
LEK NAME													
Fan Rock		96	137	129	78							152	
Fly Creek												41	
Mule Creek #1													
Mule Creek #2													
Slater Canyon													
Slater Park													
West Gibralter #1													
West Gibralter #2													
West Gibralter #3													
West Gibralter #4													
Total # of males	96	137	129	78	0	0	0	0	0	0	193	0	
Total # of active leks	1	1	1	1	0	0	0	0	0	0	2	0	
Average # male per lek	96	137	129	78							97		

MANAGEMENT ZONE 4a		HCM1981	HCM1982	HCM1983	HCM1984	HMC1985	HCM1986	HCM1987	HCM1988	HCM1989	HCM1990	HCM1991	HCM1992
LEK NAME													
Fan Rock								76	44	58	999	999	999
Fly Creek				0				0	0	10	0	0	999
Mule Creek #1								0	0	0	0	0	
Mule Creek #2											18	999	999
Slater Canyon								28	34	45	999	999	999
Slater Park													
West Gibralter #1								999	34	42	0		999
West Gibralter #2								999	28	28	0		999
West Gibralter #3													
West Gibralter #4													
Total # of males	0	0	0	0	0	0	104	140	183	18	0	0	
Total # of active leks	0	0	0	0	0	0	4	4	5	3	3	6	
Average # male per lek							26	35	37	6	0	0	

MANAGEMENT ZONE 4a		HCM1993	HCM1994	HCM1995	HCM1996	HCM1997	HCM1998	HCM1999	HCM2000	HCM2001	HCM2002	HCM2003	HCM2004	HCM2005
LEK NAME														
Fan Rock		999	21	24	27	18	16	29	11	32	49	63	49	51
Fly Creek						0		0	0	0	0	0	0	
Mule Creek #1		0		0			0	0	0	0	0	0	0	0
Mule Creek #2		999					0	0	0	0	0	0	0	0
Slater Canyon		999	19			23	19	16	9	6	4	1	0	0
Slater Park							15	0	0	0	0	0	0	
West Gibralter #1			999				19	0	0	84	0	0	16	51
West Gibralter #2			999				0	0	0	21	0	0	0	
West Gibralter #3													158	165
West Gibralter #4														17
Total # of males	0	40	24	27	41	69	45	20	143	53	64	240	267	
Total # of active leks	3	4	1	1	2	4	2	2	4	2	2	4	4	3
Average # male per lek	0	10	24	27	21	17	23	10	36	27	32	60	89	

MANAGEMENT ZONE 4b																
LEK NAME	HCM1958	HCM1959	HCM1960	HCM1961	HCM1962	HCM1963	HCM1964	HCM1965	HCM1966	HCM1967	HCM1968	HCM1969	HCM1970	HCM1971	HCM1972	HCM1973
19 Road #2																
29 Road #1	32	33	45	0	72	36	32	24	27	47						
29 Road #2	14	34														
29 Road #3																
California Park Road																
Dunkley Park																
Fortification #1	15	9	17	14	18	4	3	0	0	0	0	0	0	0	37	
Gnat Hill																
High Mesa	15			0	0	0	0	0	0	44	32	50	57	54	50	
Jen-Cody																
Sage Creek																
Sleeping Giant																
Twenty Mile Park NE																
Total # of males	76	76	62	14	90	40	35	24	27	91	32	50	57	54	87	0
Total # of active leks	4	3	2	1	2	2	2	1	1	2	1	1	1	1	2	0
Average # male per lek	19	25	31	14	45	20	18	24	27	46	32	50	57	54	44	

MANAGEMENT ZONE 4b																
LEK NAME	HCM1974	HCM1975	HCM1976	HCM1977	HCM1978	HCM1979	HCM1980	HCM1981	HCM1982	HCM1983	HCM1984	HMC1985	HCM1986	HCM1987	HCM1988	HCM1989
19 Road #2																
29 Road #1						0							0	0	0	
29 Road #2						153							999			
29 Road #3													999	89	999	
California Park Road																
Dunkley Park																
Fortification #1													0	0	0	
Gnat Hill																
High Mesa													0	0	0	
Jen-Cody																
Sage Creek																
Sleeping Giant																
Twenty Mile Park NE																
Total # of males	0	0	0	0	0	153	0	89	0							
Total # of active leks	0	0	0	0	0	1	0	0	0	0	0	0	2	1	1	
Average # male per lek						153							0	89	0	

MANAGEMENT ZONE 4b		HCM1990	HCM1991	HCM1992	HCM1993	HCM1994	HCM1995	HCM1996	HCM1997	HCM1998	HCM1999	HCM2000	HCM2001	HCM2002	HCM2003	HCM2004	HCM2005
LEK NAME																	
19 Road #2										0							
29 Road #1	0	0	0	0	0		40	22	6	8	25	42		14	18	30	34
29 Road #2																	46
29 Road #3																	
California Park Road							3				9	9		8	15	13	45
Dunkley Park											7	8	5		999		9
Fortification #1	0	0	0	0						0	0	0	0	0	0		
Gnat Hill														4		5	7
High Mesa	0	0	0			0											
Jen-Cody										24	20		23	13	11	13	20
Sage Creek							0				14	9	2	3		6	7
Sleeping Giant			19						0	0	0				999	12	12
Twenty Mile Park NE												11			999		7
Total # of males	0	0	19	0	40	25	6	8	49	85	36	47	51	56	83	153	
Total # of active leks	0	0	1	0	1	2	1	1	2	4	4	4	6	5	7	8	
Average # male per lek			19		40	13	6	8	25	21	9	12	9	11	12	19	

MANAGEMENT ZONE 5	HCM1953	HCM1954	HCM1955	HCM1956	HCM1957	HCM1958	HCM1959	HCM1960	HCM1961	HCM1962	HCM1963	HCM1964	HCM1965	HCM1966	HCM1967	HCM1968	HCM1969	HCM1970
Antelope Knoll						20	31		62	81	59	60	52	73	100	61	141	66
Axial Basin/SG 5																		
Bekkedahl's CRP																		
Boxelder Gulch #1																		
Boxelder Gulch #2																		
Brushbeat																		
Clarida Ranch							48		0	37	12	3	2	5	6	1	0	
Colowyo																		
Crooked Wash																		
Cross Mountain #1					7	30	32		0	27	7	4	4	10	17	12	18	
Cross Mountain #2					8	14	20		0	23	5	3	8	16	43	26	29	
Cross Mountain #3																		
CRP																		
Doug's Knob																		
Dry Lake #1		31				19	37	34	42	47	36	3	0	0	18	31	38	0
Dry Lake #2	25	37				27	34	31	48	22	26	12	21	28	30	54	67	70
Dry Lake #3																		
Dry Lake #4																		
Duffy Mountain																		
East Box Elder																		
Gossard/SG 12																		
Juniper New																		
Juniper Springs #1A																91	78	87
Juniper Springs #1B																		
Juniper Springs #2/SG 13																		
Kourlis																		
Lone Tree																		
Morgan Gulch #1																		
Morgan Gulch #2A/SG 10																		
Morgan Gulch #2B																		
Morgan Gulch #3/SG 9																		
New Cross Mountain (Stackyard)																		
New Lone Tree																		
Nichols #1		16					0	0			0	0	0					
Nichols #2		25					0	2			0	0	0					
Red Gravel																		
Royster #1																		
Royster #2																		
Royster #3																		
SG 1 and 2/Upper Wilson																		
SG 3/Collom 1																		
SG 4/Collom 2																		
SG 6																		
SG 7/Burn Lek																		
SG 8/Upper Morgan																		
Temple Gulch/SG 14																		
Thornburg Well																		
Walk In Trap																		
West Boxelder #1/SG 11																		
West Boxelder #2																		
Wolf Mountain					6	0			7	3	0	0	0	0				
Yellow Jacket 1																		
Yellow Jacket 2																		
Total # of males	25	109	0	0	0	87	148	165	152	157	211	99	83	115	179	303	363	270
Total # of active leks	1	4	0	0	0	6	6	5	3	4	7	6	5	5	6	7	7	5
Average # male per lek	25	27				15	25	33	51	39	30	17	17	23	30	43	52	54

MANAGEMENT ZONE 5																		
LEK NAME	HCM1971	HCM1972	HCM1973	HCM1974	HCM1975	HCM1976	HCM1977	HCM1978	HCM1979	HCM1980	HCM1981	HCM1982	HCM1983	HCM1984	HMC1985	HCM1986	HCM1987	HCM1988
Antelope Knoll																	0	
Axial Basin/SG 5	76	60						58	34	72						999	0	
Bekkedahl's CRP																		
Boxelder Gulch #1								60	44	71				13	24		999	66
Boxelder Gulch #2									44	62				70		999	10	
Brushbeat																		
Clarida Ranch	34	0																
Colowyo																		
Crooked Wash																		
Cross Mountain #1	18	27						25	31	27				19	30			
Cross Mountain #2	21	0						13	5	17				4	8			
Cross Mountain #3									30					28	24			
CRP																		
Doug's Knob																		
Dry Lake #1	0	1															0	
Dry Lake #2	38	59						35	56	117							0	
Dry Lake #3																	0	
Dry Lake #4																	21	
Duffy Mountain								27	14							0	0	
East Box Elder																		
Gossard/SG 12																		
Juniper New																		
Juniper Springs #1A	77	72						31	45	45						999	33	
Juniper Springs #1B																999	57	
Juniper Springs #2/SG 13									15	8				11	7		0	0
Kourlis																		
Lone Tree								22	24	68				20	10		5	
Morgan Gulch #1								8	4	2						0	0	
Morgan Gulch #2A/SG 10								39	43	43				22	15		0	0
Morgan Gulch #2B																999	46	
Morgan Gulch #3/SG 9									24	78						999	57	
New Cross Mountain (Stackyard)																		
New Lone Tree																		
Nichols #1																		
Nichols #2																		
Red Gravel																		
Royster #1																		
Royster #2																		
Royster #3																		
SG 1 and 2/Upper Wilson														8	0			
SG 3/Collom 1														40	6			
SG 4/Collom 2														30	40			
SG 6															3			
SG 7/Burn Lek																		
SG 8/Upper Morgan																		
Temple Gulch/SG 14																999	23	
Thornburg Well																999	19	
Walk In Trap																		
West Boxelder #1/SG 11																		
West Boxelder #2																		
Wolf Mountain								22	17	43							38	
Yellow Jacket 1														38	0	0	0	0
Yellow Jacket 2																		
Total # of males	264	219	0	0	0	0	0	376	464	813	0	78	151	281	0	0	0	375
Total # of active leks	6	5	0	0	0	0	0	12	16	17	0	3	9	13	0	0	0	11
Average # male per lek	44	44						31	29	48		26	17	22			0	34

MANAGEMENT ZONE 5	HCM1990	HCM1991	HCM1992	HCM1993	HCM1994	HCM1995	HCM1996	HCM1997	HCM1998	HCM1999	HCM2000	HCM2001	HCM2002	HCM2003	HCM2004	HCM2005
Antelope Knoll	0	0							0	0	0	0	0	0	0	0
Axial Basin/SG 5	3	0	0		0	0	0	0	0	0	0	0	0	0	0	6
Bekkedahl's CRP																21
Boxelder Gulch #1	45	9	0		0			0	0	0	0	8	0	0	17	28
Boxelder Gulch #2	3	25	0		0			0	36							
Brushbeat																
Clarida Ranch	1								0	0	0	0	0	0		
Colowyo									33			0	0	0		
Crooked Wash																9
Cross Mountain #1	22				6				15	3	0	2	8	0	0	
Cross Mountain #2					0				14	19	14	8	4	0	6	6
Cross Mountain #3	26				13				8	17	12	6	4	3	0	0
CRP																
Doug's Knob												9	11	8	3	
Dry Lake #1	0	0							37	8	0	31	0	23	0	
Dry Lake #2	0	0		25	17	12	24	29	38	28	60	29	30	30	25	32
Dry Lake #3	0	0							0	0	0	0	0	0	0	0
Dry Lake #4	14	75							0	0	0	0	0	0	0	0
Duffy Mountain	0	0	0		0	0		0		0	0	0	0	0	0	0
East Box Elder																0
Gossard/SG 12									28	31	10	8	8	11	14	12
Juniper New																
Juniper Springs #1A	38	54	16		5	0	0	0	0	1	0	0	0	0	0	0
Juniper Springs #1B	24	10	0					0	0	0	0	0	0	0	0	0
Juniper Springs #2/SG 13	3	0	0		0	0	0	0	0	32	27	16	18	14	11	25
Kourlis									0	0	0	7	0	0		
Lone Tree	27	29	23	17	15				2	15	9	7	2	4	0	0
Morgan Gulch #1	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
Morgan Gulch #2A/SG 10	0	0	0		3	10	0	36	23	49	37	30	23	39	39	81
Morgan Gulch #2B	48	21	26					0	0	0	0	0	0	0	0	
Morgan Gulch #3/SG 9	28	34	25		10	0	0	13	16	11	25	11	5	32	36	32
New Cross Mountain (Sta)	28								0	0	0	0	0	0	3	14
New Lone Tree					15				16	9	8	7	14	9	5	14
Nichols #1																
Nichols #2																
Red Gravel																
Royster #1										14	31	14	22	28	38	
Royster #2									2	0	6	0	0	0	0	
Royster #3									8	0	0	0	0	0	0	
SG 1 and 2/Upper Wilson					1	3	4	8	9	8				0	0	
SG 3/Collom 1					1	4	4	0	0	6				0	0	
SG 4/Collom 2					0	4	0	16	14	11				17		
SG 6					0	0	0		0	0						
SG 7/Burn Lek					6	22	23	33	29				29	38		
SG 8/Upper Morgan								14	10	6				0	0	
Temple Gulch/SG 14	28	20	18		0	0		0	0	20	12	7	0	10	3	6
Thornburg Well	17	8	6	3	0			1	9	15	17	22	19	20	31	
Walk In Trap																
West Boxelder #1/SG 11						17	27	47	59	53	42	33	15	25	28	28
West Boxelder #2								0	0	0	0	0	0			
Wolf Mountain	20	13			0				30	0	0	0	0	5	6	4
Yellow Jacket 1	7	0	0		999	0	0	0	5	30	0	2	0	0	0	
Yellow Jacket 2					999			0		0	0	0	0	0	0	
Total # of males	382	298	114	45	86	56	81	186	422	370	325	258	184	257	295	428
Total # of active leks	18	11	6	3	12	7	5	8	19	21	16	17	16	15	17	19
Average # male per lek	21	27	19	15	7	8	16	23	22	18	20	15	12	17	17	23

MANAGEMENT ZONE 6																
LEK NAME	HCM1958	HCM1959	HCM1960	HCM1961	HCM1962	HCM1963	HCM1964	HCM1965	HCM1966	HCM1967	HCM1968	HCM1969	HCM1970	HCM1971	HCM1972	HCM1973
13 Mile Marker																
25 Marker A																
25 Marker B																
Antelope Draw/Bear Creek																
Bear Creek #1	26	9	3	17	19	5	15	31	12	18	22	58	23	13	0	
Bear Creek #2																
Boise Creek																
Brady																
Cactus Reservoir																
Divide Creek #1																
Divide Creek #2																
Dripping Rock																
East Antelope																
Elk Springs Draw																
Escalante		19	99	110	39	56	45	33	20	45	81	79	28	54	2	
Hammond Draw																
Haslim Cow Camp																
Hatch Flats																
Karen Ranch	20	16	62	98	118	46	62	28	27	51	88	109	75	87	18	
Luxen Draw																
MC Road 16 A																
Miller Creek																
Peterson Draw																
Red Wash																
Stateliner-Stuntz	12	27	14	30	29	26	50	26	34	78	0	94	35	63	64	
Three Springs																
Total # of males	58	71	178	255	205	133	172	118	93	192	191	340	161	217	84	0
Total # of active leks	3	4	4	4	4	4	4	4	4	4	3	4	4	3	0	
Average # male per lek	19	18	45	64	51	33	43	30	23	48	64	85	40	54	28	

MANAGEMENT ZONE 6																
LEK NAME	HCM1974	HCM1975	HCM1976	HCM1977	HCM1978	HCM1979	HCM1980	HCM1981	HCM1982	HCM1983	HCM1984	HMC1985	HCM1986	HCM1987	HCM1988	HCM1989
13 Mile Marker														0	0	0
25 Marker A													11	5	0	
25 Marker B													999	15	0	
Antelope Draw/Bear Creek																
Bear Creek #1					64	36	18	34	45				25	30	33	49
Bear Creek #2																
Boise Creek																
Brady																
Cactus Reservoir													999	999	31	
Divide Creek #1																
Divide Creek #2																
Dripping Rock																22
East Antelope																
Elk Springs Draw																
Escalante		62			112	45	55	87	63				69	77	64	58
Hammond Draw																
Haslim Cow Camp		40			97	65	83	79	49				158	187	180	209
Hatch Flats																
Karen Ranch		26	65		80	61	54	22	65				74	91	75	90
Luxen Draw									30				0			
MC Road 16 A					77	44	0		10				25	9	29	26
Miller Creek									19				28	30	42	
Peterson Draw													9	12	0	
Red Wash																
Staseline-Stuntz			92		2	27	68	79	30				67	70	79	94
Three Springs													0			
Total # of males	0	0	26	259	0	432	278	278	301	311	0	0	418	512	522	621
Total # of active leks	0	0	1	4	0	6	6	5	5	8	0	0	6	11	11	9
Average # male per lek			26	65		72	46	56	60	39			70	47	47	69

MANAGEMENT ZONE 6	HCM1990	HCM1991	HCM1992	HCM1993	HCM1994	HCM1995	HCM1996	HCM1997	HCM1998	HCM1999	HCM2000	HCM2001	HCM2002	HCM2003	HCM2004	HCM2005
LEK NAME																
13 Mile Marker	0	2	7		0				0	0	0	0	0	0	0	0
25 Marker A		0			6											
25 Marker B		0			0											
Antelope Draw/Bear Creek		23	57	17	59				71	67	59	58	29	35	65	
Bear Creek #1	36	61	42	41	59				78							74
Bear Creek #2					30											
Boise Creek																
Brady										0	13	1	4	0		3
Cactus Reservoir	14	11	10	8	12				0							0
Divide Creek #1				15	0				0	11	2	0	0	6	0	0
Divide Creek #2		8	5	15	19											
Dripping Rock	14		0											0	0	
East Antelope				0												
Elk Springs Draw		35	9	12	11				0	17	13	14	16	9	16	34
Escalante	36	16	8	8	15				3	0	29	5	10	14	11	
Hammond Draw																
Haslim Cow Camp	143	138	143	71	75				131	143	103	108	132	134	123	130
Hatch Flats																0
Karen Ranch	88	101	97	62	82				98	113	87	81	57	30	40	69
Luxen Draw		0	0		0				0	0	0	0	0	0		
MC Road 16 A	8	13	11	21	28				57	38	39	28	21	19	8	6
Miller Creek	11	12	7	4	9											
Peterson Draw	7	6	8	0	25				0	0	0	0	0	0	0	0
Red Wash														25		
Staseline-Stuntz	59	29	18	13	22				65	90	84	54	68	49	40	41
Three Springs	0	0		0	19				0	0	0	0	0	0	0	
Total # of males	416	455	422	287	471	0	0	0	503	479	429	349	337	321	303	357
Total # of active leks	10	13	13	12	15	0	0	0	7	7	9	8	8	9	7	7
Average # male per lek	42	35	32	24	31				72	68	48	44	42	36	43	51

MANAGEMENT ZONE 7		HCM1992	HCM1993	HCM1994	HCM1995	HCM1996	HCM1997	HCM1998	HCM1999	HCM2000	HCM2001	HCM2002	HCM2003	HCM2004	HCM2005
LEK NAME															
Deer Lick Draw	15														
Rasmussen														11	23
Total # of males	15	0	11	23											
Total # of active leks	1	0	1	1											
Average # male per lek	15													11	23

For each management zone, the beginning year is the first year where data exist for leks in the specific management zone. 999 signifies that sage-grouse were at the lek, but no specific count data exist. The lek counted is as active. 0 signifies that the lek was counted, but no grouse were seen.

Appendix B:

Hunting and

Harvest

Information

APPENDIX B: HUNTING AND HARVEST INFORMATION

TO: Brad Petch

DATE: 13 November 2006

FROM: Rick Hoffman

SUBJ: Greater sage-grouse wing analyses for Moffat County from 2002-2005

I think the information summarized in the tables is self-explanatory. Some of the data sheets were incomplete. For instance, there were 6 wings collected from the barrel at MCR 16 at US 40 for which the data sheet did not have the year of collection. Another data sheet showed 2 wings collected but no location or year of collection was noted. No location was recorded for 6 wings collected in 2005. I excluded the 8 wings for which no date and/or location were recorded, but included the 6 wings collected from the unknown location in 2005.

I do not know how many barrels were operated each year or where the barrels were located. I strongly suspect there were inconsistencies in the number and location of barrels operated each year. Also, the barrels were checked at different times. Some were only checked once during the course of the season. Others were checked 2 or 3 times. Still others were not checked until 3 or 4 days after the season closed. Thus, I was not able to assign all the wings to a specific time period (i.e., weekend or weekday) of harvest.

I am not totally certain, but I believe the barrel at MCR 19 and US 40 is the same as the barrel at Hwy 318 and US 40 (see highlights in Table 1). This is the Maybell barrel. To avoid confusion, the same description should be used each year to denote the barrel locations.

I recommend checking the barrels on Monday morning following the opening weekend and on Saturday following the last day of the season. It is important to operate the barrels in the same location every year and to record the number of wings collected each time a barrel is checked. This includes recording when no wings are collected. In the past, we used a standardized form for checking the barrels. It seems no one is using this form anymore.

Clearly, the number of wings collected has declined since the Division implemented the one week season and 2 and 4 bag and possession limits. The magical number that has been thrown out as the minimum necessary for a meaningful sample is 100 adult and yearling females (Connelly, J. W., K. P. Reese, and M. S. Schroeder. 2003. Monitoring of greater sage-grouse habitats and populations. University of Idaho, College of Natural Resources Experiment Station Bulletin 80. Moscow, ID, USA). This figure was only attained in 2005 when 107 wings from adult and yearling females were collected. Despite the small sample of wings collected in some years, I recommend the Division continue to operate wing barrels in Moffat County.

Table 1. Number of greater sage-grouse wings collected during the fall hunting season by wing barrel location, Moffat County, 2002-2005.

Location	2002	2003	2004	2005
Dinosaur	22	84	29	52
MRC 16 @ US 40		4	10	
Limestone Gap	6	3	26	7
MCR 318 @ US 40	3		9	
MCR 72 @ MCR 10N	40	48		100
MCR 7 @ MCR 3	41	64	10	71
MCR 19 @ US 40	14			5
MCR 17N @ US 40		25	8	23
MCR 17S @ US 40	2			
MCR 16S @ stateline		29		
Cedar Mountain	20			
MCR 3 @ Hwy 13		9	8	21
MCR 4 @ Hwy 13		20		4
MCR 17S @ MCR 51		2		3
MCR 57 @ US 40		1		12
MCR 27 @ Hwy 13 (closed)		4		
Unknown				6
TOTAL	148	293	100	304

Table 2. Number of greater sage-grouse wings collected during the fall hunting season by time period, Moffat County, 2002-2005.

Year	Opening Weekend (%)	Opening Week (%)	Unknown (%)	Total
2002	118 (80)	8 (5)	22 (15)	148
2003	196 (67)	63 (21)	34 (12)	293
2004	32 (32)	33 (33)	35 (35)	100
2005	184 (61)	114 (37)	6 (2)	304

Table 3. Age composition of the fall harvest of greater sage-grouse based on wing collections, Moffat County, 2002-2005.

Year	Adults (%)	Yearlings (%)	Juveniles (%)	Total
2002	45 (30)	48 (33)	55 (37)	148
2003	77 (26)	51 (18)	165 (56)	293
2004	25 (25)	33 (33)	42 (42)	100

2005	79 (26)	79 (26)	146 (48)	304
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Table 4. Sex composition of the fall harvest of greater sage-grouse based on wing collections, Moffat County, 2002-2005.

Year	Adults		Yearlings		Juveniles	
	M	F (%)	M	F (%)	M	F (%)
2002	12	33(73)	16	32(67)	26	29(53)
2003	21	56(73)	14	37(73)	58	107(65)
2004	12	13(52)	5	28(85)	25	17(40)
2005	26	53(67)	25	54(68)	61	85(58)

Table 5. Minimum estimated nesting success (%) of female greater sage-grouse harvested in Moffat County, 2002-2005, based on stage of primary molt. Sample sizes are in parentheses.

Year	Adults	Yearlings	Adults and Yearlings
2002	36 (33)	22 (32)	29 (65)
2003	38 (56)	35 (37)	37 (93)
2004	46 (13)	36 (28)	39 (41)
2005	58 (53)	35 (54)	47 (107)

Table 6. Juveniles per female (adult and yearling) in the fall harvest of greater sage-grouse, Moffat County, 2002-2003.

Year	Juveniles:Female
2002	0.85:1
2003	1.77:1
2004	1.02:1
2005	1.36:1

Appendix C: Completed Projects

APPENDIX C: COMPLETED PROJECTS

<u>General Location or Ownership</u>	<u>Project Description and Purpose</u>	<u>Acres Treated (if applicable)</u>	<u>Project Completed By</u>	<u>Year Completed</u>
Browns Park SWA	Brush control to improve brood-rearing habitat	40	CDOW	2001-2002
Little Snake SWA	Brush control to improve brood-rearing habitat	130	CDOW	2001-2002
Private land, NE of Craig	CRP stand management to enhance brood-rearing habitat	1000	CDOW/Landowner	2001-2002
Private land	Prescribed burns to improve riparian brood rearing habitat	Less than 100	Landowner	2001-2002
Private Land, SE of Hayden	Brush control and seeding to improve historic/potential brood-rearing habitat	500	Landowner	2003
Little Snake SWA	Prescribed burns to improve brood rearing habitat	170	CDOW	2003
Private land, N of Maybell	Water developments for livestock to improve range condition; wildlife guzzlers accessible to GrSG	N/A	NRCS/Landowner	2003
Douglas Mountain	3 prescribed burns to maintain sagebrush parks and remove juniper encroachment	1200	BLM	2003

Private land, NE of Craig	Brush control	5	Landowner	2003
	Native forb seed collection to develop seed stock	N/A	UCEPC	2003
Douglas Mountain	Brush control	500	BLM	2004
Conway Draw	Brush control; Reseed in drought-related sagebrush die-off area		BLM	2004
Little Snake SWA	Red Wash burn reseeded to restore degraded riparian area	120	CDOW	2004
Little Snake SWA	Wildlife guzzlers accessible to GrSG	N/A	CDOW	2004
Private land, N of Craig	Water developments for livestock to improve range condition; wildlife guzzlers accessible to GrSG	N/A	NRCS/Landowner	2004
Sevenmile Ridge	Juniper encroachment removal	750	BLM	2005
Private land, Great Divide	Brush control to improve brood-rearing habitat	600	NRCS/Landowner	2007
Private land, W of Craig	Brush control to improve brood-rearing habitat	300	NRCS/Landowner	2007
Private land, Great Divide	Brush control to improve brood-rearing habitat	400	NRCS/Landowner	2007