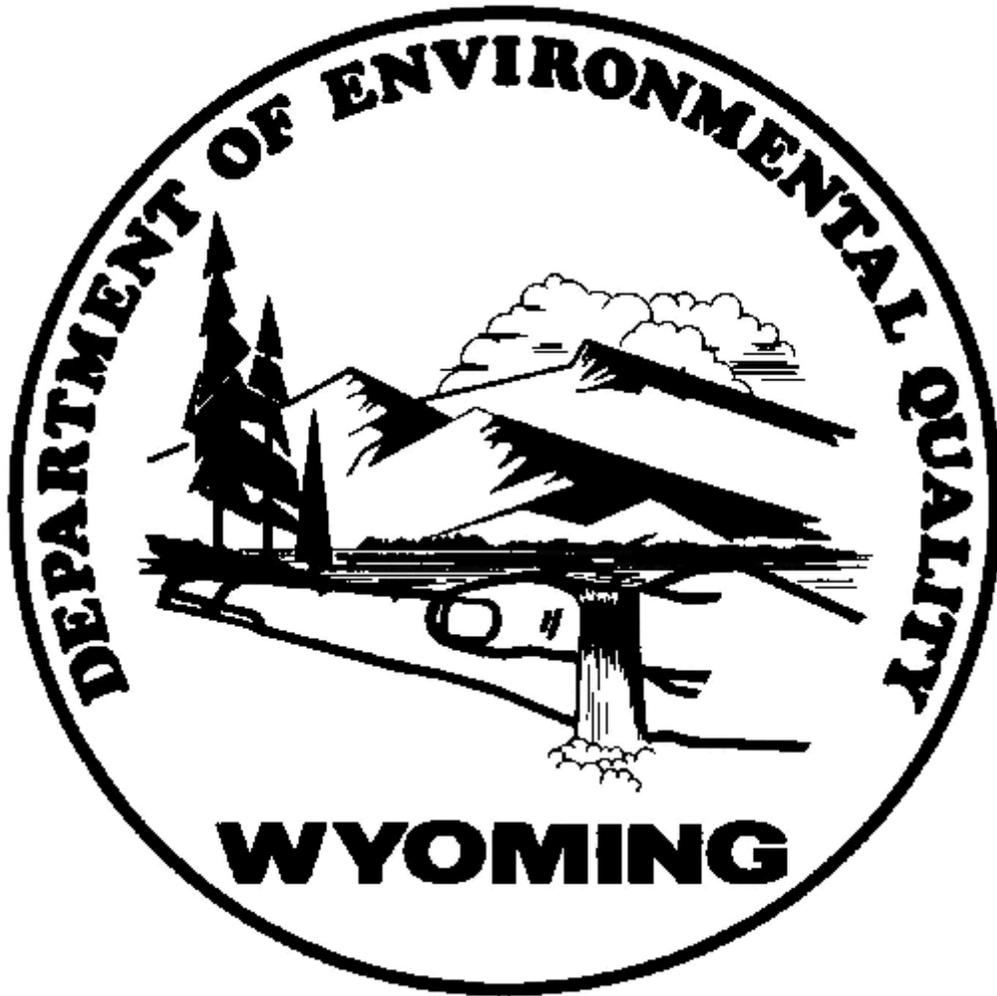


**DEPARTMENT OF ENVIRONMENTAL QUALITY  
LAND QUALITY DIVISION**



**GUIDELINE NO. 5**

**WILDLIFE**

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This document is a guideline only. Its contents are not to be interpreted by applicants or DEQ staff as mandatory. The guideline is intended to assist mine permit applicants in conducting wildlife inventories and in preparing wildlife sections of mining and reclamation plans. The term "Wildlife", as used here, means both terrestrial and aquatic species. Suggested methods are designed to standardize data reported in permit applications, yet allow flexibility in choosing survey methods. Alternate methods are acceptable if they yield comparable results. To avoid disagreements during the permit review process, however, we encourage that alternate methods be cleared with the Game and Fish Department or DEQ prior to their implementation. Data should be presented as outlined in the attached appendix. The general recommendations of this guideline are designed for the larger surface mining operations. Depending on the size, location, and specific impacts of an operation, certain portions of this guideline may not apply. Permit applicants should consult the Wyoming Game and Fish Department or the Department of Environmental Quality to develop baseline study designs appropriate for individual operations. In some cases, baseline information may be available from studies conducted in similar habitat types on adjacent surfaces. If this information is current (collected within 5 years preceding the application submittal) it may be referenced in lieu of collecting new data. The requested information will allow determination of:

1. Composition of the wildlife community, species diversity, and habitat affinity prior to mining.
2. Mining impacts upon wildlife and habitat.
3. Effectiveness of mitigation and reclamation proposals.

## **I. INFORMATION NEEDED IN A WILDLIFE INVENTORY**

### **A. A description of the vertebrate fauna of the area**

#### **(1) Potential**

A list should be developed to indicate species likely to occur in the area according to literature sources such as those at the end of this guideline. The list should be compiled before undertaking field studies, but after a visit to the site. Common sense should be used in preparing the list. If habitat for a particular species is not present, the species should not be listed, even though its range overlaps the mine site. The potential species lists should appear as a table in Appendix D-9 of the permit application.

#### **(2) Actual**

This includes species recorded on the permit area based upon observations of animals or their sign during trapping or census activities, existing data for the area, and reliable reports from local observers such as state, federal, and company biologists and local ranchers. These can be indicated on the potential species list by an asterisk.

(3) Habitat Description

Wildlife habitat on the permit area should be classified according to habitat types used in the Wyoming Game and Fish Department's Wildlife Observation System (see Literature Cited). Both vegetative and physical habitat types should be included. Vegetative types are generally the major plant communities, while physical types include such things as stock ponds, playas, rough breaks, rock outcrops, and rimrocks. The acreage encompassed by each habitat type and the acreage to be disturbed should be tabulated for impact analysis. All habitat types existing prior to mining should be delineated on a map except those physical types that occupy little area or are too interspersed within a vegetative type to be mapped.

The purpose of this is to indicate the amount of wildlife habitat and its location on the permit area before mining in order to evaluate the Reclamation Plan.

(4) Habitat Affinity

Habitat affinity data are designed to illustrate which habitat types are of most value to wildlife. The intent is to use this information to decide whether postmining reclamation is adequate to restore important wildlife habitat. The underlying assumption is that if an animal is present in a habitat type and has not been chased or otherwise forced there, it has an affinity or attraction to that habitat type. Those habitat types for which the most wildlife species have an affinity are presumed to be the most valuable, and those needing emphasis in wildlife-oriented reclamation.

A biologist sampling for habitat affinity is sampling animal occurrence as indicated by presence of the animal or its sign. Observations used to determine habitat affinity cannot be based upon one or two days data. There should be several observation periods throughout the biological year, since affinity may change seasonally depending upon living requirements at various times of the year. Habitat affinity determination requires accumulation of data from direct counts, bird transects, brood counts, raptor surveys, small mammal trapping, and incidental observations. The biologist should record the habitat type in which an animal is observed each time an observation is made. The relative value of each habitat can be determined from the number of species seen there and the relative value of certain habitat types to individual species can be based on the frequency of occurrence in each habitat type. To avoid bias due to an unbalanced sampling approach, frequency of occurrence should be adjusted to reflect the amount of sampling effort expended in each habitat type.

For some animals, habitat affinity on-site may be the same year long. For example, mule deer on many coal leases may only be found in rough, broken terrain, in riparian habitat, or in stands of scattered trees and tall shrubs. Bushy-tailed woodrats and cottontail rabbits may only occur along a rimrock. There will

be a relationship between some wildlife species and certain topographic or vegetative features on all areas surveyed.

B. Seasonal Data Collection

An adequate assessment of wildlife occurrence in an area cannot be made in less than one year. "Seasonal" as used in this guideline does not mean sampling in spring, summer, fall, and winter for all species. The following data collection intervals reflect periods of "seasonal" importance in the annual cycle of various wildlife groups:

- (1) Big Game  
All Seasons - numbers, distribution and habitat affinity. Particularly important are winter occurrence (January - February). Production prehunt (July - August) and total number posthunt (November - December).
- (2) Upland Game Birds  
Breeding counts (April)  
Production of young (Mid-June - August)  
Winter occurrence (December - Mid-February)  
Seasonal habitat affinity
- (3) Raptors  
Nest location (Yearlong)  
Nest status - active or inactive (April)  
Production - are young present? (June)  
Winter occurrence (December - Mid-February)
- (4) Waterfowl and Shorebirds  
Spring migration (April - May)  
Fall migration (September - November)  
Production - are young present? (late June - July)
- (5) Passerine Birds  
Breeding (late May - June)  
Winter occurrence (December - February)  
Habitat affinity during each of the above seasons
- (6) Other Mammals  
Species occurrence - all seasons (by incidental observations of animals and sign)  
Small mammals - trapping (July - September)  
Rabbits (August - January)  
Habitat affinity during each of the above seasons

- (7) Threatened and Endangered Species
  - Peregrine falcon (March - May, September - November)
  - Black-footed ferret (July 1 - September 15, December 1 - April 15)
  - Bald Eagle breeding and nesting (April - Mid-June)
  - Winter eagle roosts or feeding areas (January - February)
  - Whooping Crane and Grizzly Bear - where survey is necessary, consult WGFD and USFWS
  
- (8) Reptiles and Amphibians
  - Breeding and abundance (May - July)
  - There are species variations and altitudinal variations for both groups.
  
- (9) Fish
  - Breeding (March - November, with species variations)
  - Abundance (all year)

C. Data Analysis

All data should be reported on Wyoming Game and Fish Department Wildlife Observation Forms and copies sent to the area biologist. Data should be presented in Appendix D-9 of the mine permit application. At the beginning of the section on each group of animals, data collection techniques should be described in sufficient detail that they could be replicated by a competent field biologist. Otherwise, an appropriate literature citation should be provided. Dates of data collection should be specified. An analysis and thorough discussion of the data should be included by groups of animals (raptors, big game, other mammals, passerine birds, etc). Anticipated impacts on wildlife should be summarized. Big game, upland game, raptor, predator, and rare species sightings should be plotted on the habitat map along with locations of trapping plots, transects, and driving (survey) routes. If necessary, the requested data may be plotted on more than one map to avoid cluttering.

D. Mitigation Plan

Once potential impacts have been identified by the company, methods to minimize impacts to wildlife during and after mining should be developed and described in the Mine Plan. Impact abatement procedures will often be tailored to fit individual sites. Acceptable mitigation includes proper fencing, obtaining or providing recreational access, controlled speed limits, programs to educate employees about game laws and sensitive wildlife species, replacement of dead snags, creation or development of water sources, protection of riparian areas from grazing, reestablishment of raptor nesting sites, wildlife-oriented reclamation, problem solving research, and habitat improvement projects. Mine personnel are encouraged to develop new and innovative techniques (within legal constraints) to help offset mine impacts. All fence designs should be provided, referencing specific types described in Guideline 10. The U.S. Fish and Wildlife Service, Office of Ecological

Services, should be contacted early regarding raptor nest conflicts and the possible presence of threatened or endangered species. The outcome of this consultation should be discussed in the Mine Plan. Mitigation procedures should be described and supported by a letter of concurrence from the USFWS.

E. Reclamation Plan

Where wildlife habitat will be part of the postmine land use, Land Quality Division regulations require development of a plan to restore this use. All habitat reclamation procedures should be described in the Reclamation Plan of the permit application. Unless the premining land was badly managed, baseline data on wildlife use of the permit area will provide a valuable reference for development of the Reclamation Plan and for evaluating the effectiveness of current reclamation practices. For wildlife reclamation, emphasis should be placed upon habitat features that promote maximum species diversity following mining. The Reclamation Plan should integrate vegetative components and those physical (landform) features required to perpetuate diverse plant communities. Reclamation designed to produce shrubland or a mixture of grasses, shrubs, and forbs will benefit wildlife more than straight grassland and/or agricultural crops. Varying gradients in slope, surface aspect, and soil moisture are required to promote structurally diverse vegetation. To accomplish this, operators should incorporate diverse slopes, surface undulations, minor depressions, swales, convoluted drainage ways and rock piles. Generally, the more diverse the plant and animal composition on the reclaimed area, the more stable the system is and the more chance that something will survive climatic extremes like drought, freezing temperatures or prolonged heavy snowfall.

The Reclamation Plan should present a statement of the reclamation goal and a timetable for achieving that goal. Revegetation should include native plant species, preferably a mixture of some of those species on site prior to mining. Seed mixtures will have to be tailored to soil and topography - one seed mixture may not suffice throughout a large site. Topographic and plant species diversity are both essential to replace wildlife habitat. Aquatic habitat within streams supporting fish and stock ponds used by wildlife should be restored.

Wildlife reclamation and enhancement measures planned by the applicant should be explained, not just identified, though the applicant has the option to alter plans as material availability and technology change. Reclamation Plan changes may be proposed in permit renewal applications or by permit revision.

Suggested reclamation and enhancement practices include restoration of diverse land forms, direct topsoil replacement, shrub and tree transplants, nest structures, rock pile construction, snags and brush piles, water source development, stream rehabilitation (fish habitat structures, pools, riffles, etc.), riparian zones, creation of lakes suitable for fisheries, and where variances can be obtained, development of highwalls to simulate natural rimrocks. Operators are encouraged to investigate other techniques as well.

Proposed locations of habitat components, including seed mixtures, should be plotted on a topographic map. This will allow comparison with premining habitat interspersion.

## II. INVENTORY TECHNIQUES

### A. Suggested Techniques

Objectives of the techniques discussed below are to describe major habitat types and important habitat components, to determine use of the site by important wildlife species, and to determine overall wildlife diversity on site. It is recommended that techniques for most species follow methods discussed in Wildlife Management Techniques (1980), the Wildlife Society, or Handbook of Biological Techniques (1982), Wyoming Game and Fish Department.

#### a. Vegetation

Vegetation analysis techniques contained in DEQ Guideline #2 are sufficient for classifying major vegetation communities. Black and white photographs of each vegetation or habitat type sampled for wildlife should be included. Photographs should be original prints, not xerox copies.

#### b. Habitat Types

Determination of habitat types should be made by a wildlife biologist. The major habitats generally correspond to identified vegetation types. Some physical habitats will be extensive enough to warrant sampling for wildlife as well. These types include streams, impoundments, playas, rimrocks, rough breaks, ravines, and other features (see Considerations for Wildlife in Mining and Reclamation (1976), Wyoming Game and Fish Department). Important habitat components such as rock outcrops, pools along streams, trees, and erosionally formed gullies are often interspersed within the major vegetation communities and these may substantially affect local carrying capacity. The presence of such components should be indicated. Habitat types should follow first and second order classifications in the Wyoming Game and Fish Department's Wildlife Observation System.

#### c. Big Game

On large sites, aerial surveys may be required. These should follow the Handbook of Biological Techniques and should be augmented with ground searches, either by vehicle or on foot. Deer cannot be counted accurately from the air, particularly if conditions are not perfect or if a great deal of broken terrain, tall shrubs, or trees are present. Where discernible, sexes and ages should be noted for all animals seen. Because of the mobility of big game animals, surveys should include the permit area plus at least a two-mile perimeter. The existence of seasonal concentration areas should be documented.

d. Upland Game Birds

Acceptable methodologies are described in the Handbook of Biological Techniques. Both aerial surveys and ground searches may be required to locate breeding grounds on large sites. Small sites can be covered adequately by ground searches. Searches should be made for all upland game bird species known to occur in the vicinity of the permit area. It is often helpful to contact nearby landowners, or local Game and Fish Department personnel to locate breeding grounds. Once breeding grounds are found, the number of birds using the site should be determined. Production surveys should be conducted from a vehicle or on foot, to determine use of the study area by hens with young. Winter surveys should be made to determine the number of birds using the study area during that season. Upland game surveys should include the permit area and a 2-mile perimeter, because literature indicates that over 80 percent of sage grouse nesting occurs within 2 miles of a strutting ground. Consequently, a mine within 2 miles of a strutting ground could impact grouse vent though the birds are not breeding on-site.

e. Waterfowl and Shorebirds

Waterfowl and shorebirds should be censused on all surface waters within the permit area including impoundments, streams, intermittent pools, and playas. Species composition and numbers using the permit area seasonally should be determined. Both breeding pair and brood counts should be conducted by standard waterfowl census techniques.

f. Raptors

Raptor Guidelines should be obtained from the Wyoming Game and Fish Department for appropriate survey techniques. Locations of raptor nests, feeding areas, and any roosting sites should be determined. Nests should be located during aerial flights when possible. A separate flight specifically for raptors may be necessary over large permit areas because it is difficult to locate raptors and their nests while also looking for other species.

Inconspicuous nests can be located during ground surveys. The number of young hatched in each territory should be determined, but extreme care should be taken not to unduly disturb nesting birds, particularly early in the incubation period. Surveys should include the permit area and a two-mile perimeter. For raptors which may range 10-15 miles from a nest or roost, this is minimal. If raptor nests are located on the study area, the applicant should contact the U.S.F.W.S., Office of Ecological Services, to determine which nests are likely to be disturbed, to obtain the necessary permits, and to develop appropriate mitigation plans. The outcome of this consultation, along with a description of mitigation measures, should appear in the Mine Plan. Attached at the end of this guideline (Appendix B) is the mitigation program recommended by the U.S.F.W.S.

g. Passerine Birds

Non game bird surveys should be conducted in each vegetation type, and in each major physical habitat. Acceptable methods include belt transects in most habitat types or point transects in riparian habitat. All surveys must be stratified by vegetation type, with at least two transects per type. Some transects should overlap two habitat types to determine species occurring in habitat edges. Starting points and orientation of transects should be randomly selected. If stratified random sampling is used, sample transects can be located in areas without the observer biasing selection of locations. Surveys should ideally be conducted on three consecutive days, then again one to two weeks later, to take into account temporal variation and weather effects on bird activities.

Each belt transect should be 100 m wide, but in denser or narrower habitats the width may be adjusted for better coverage. The total transect length should be 1,000 m (2,000 m per habitat type) but may consist of smaller segments totaling 1,000 m where the configuration of the habitat will not allow a continuous 1,000 m transect. Data for each segment should be recorded separately. The boundaries of belts should be marked so that observers can determine whether or not a bird is within a given belt. The observer walks the centerline and records all birds seen and heard within the belt. The time taken to walk the transect should also be recorded. Count periods should begin within 0.5 hour of local sunrise and not continue beyond 9:30 A.M.

Point transects should be used in riparian habitat, except that which is unusually narrow. The observer walks from point to point, stopping to listen and observe birds within 50 m of each point for 5 minutes. Points should be at least 100 m apart to avoid double counting. Transects can vary in length depending upon the size of habitat to be sampled. Where possible a 1,000 m transect is preferred.

h. Other Mammals

Small mammal occurrence should be determined by trapping along transects which have been randomly located. A sampling effort totaling 500 trap nights should be conducted over a 4 day period in each habitat type. Some transects or plots should overlap 2 habitat types to sample mammals occurring in habitat edges. Clusters of traps should be used to sample special habitat features such as rimrocks and pond edges. Traps should be a mixture of live traps, mouse traps, rat traps, and pitfall traps, with 1 live trap, 1 rat trap, and 2 mouse traps, at each station. Baits should be a combination of peanut butter, oatmeal, raisins, and animal fat. Transect length can vary according to size of the habitat sampled as long as the goal of 500 trap nights per vegetation type is reached. Fewer trap nights may be used in restricted habitats. Trap stations should be at least 15 m apart. At least 5 pitfall traps should be placed along each transect in locations such as runways where the probability of capturing something is greatest. Traps should be set in the evening, checked, and reset the next morning, then again in the evening. Each 24 hour period is a trap night. All captured animals should be

killed or removed from the area to prevent recaptures. Trapping can be done any time from May through July. This ensures capture of animals which begin hibernation very early. Data are reported as species caught and relative abundance (animals/100 trap nights) of each species in each habitat type.

Occurrence of medium-sized mammals can be determined from sign or observation. Lagomorph abundance should be determined by means of a walking transect through the best rabbit habitat on the permit area. Transects should be run on two consecutive nights at dusk, when there is no precipitation and the wind is no stronger than 15 mph. Data should be reported as the number of rabbits seen per standard unit of transect length.

Predators and other medium sized mammals can be located by walking the permit area and looking for the animals or their sign. The goal is to document species occurrence.

i. Endangered Species and State-listed Rare Species

Each prairie dog colony on or within 1 mile of the permit area should be mapped and density of active prairie dog holes determined. A ferret search should then be conducted on each colony. Ferret searches should follow techniques described in the most current U.S.F.W.S. guidelines and the "Handbook of Methods for Locating Black-footed Ferrets, January 1984", available from the Wyoming BLM and WGFD. Appropriate survey techniques should be determined by consulting the U.S.F.W.S. Endangered Species Office in Helena, Montana. Searches should be conducted in each prairie dog colony during baseline studies and again in each existing or new colony within 1 year prior to disturbance of that colony. Results must be submitted to OSM for clearance prior to disturbance. The occurrence of other federally listed threatened or endangered species or species that are rare in Wyoming should be determined during the course of other field work. Surveys should include all lands within 2 miles of the permit area. State-listed rare species are contained in Current Status and Inventory of Wildlife in Wyoming (1977), Wyoming Game and Fish Department, Cheyenne. The occurrence of wintering bald eagles should be evaluated by means of aerial or ground searches of the mine site and 2 mile perimeter.

j. Reptiles and Amphibians

Species occurrence should be determined by trapping, hand capture, observation, and identification of calls. Emphasis should be placed upon searching in likely habitats during the day. Drift fences are effective for collecting snakes and migrating amphibians. The biologist may capture a variety of amphibians by seining with dip nets along margins of ponds and wetlands. Turtles and water snakes may also be captured by this technique. Only specimens absolutely necessary for positive identification should be killed and preserved. Reptiles and amphibians can often be located, identified, and left unharmed - especially during the spring and early summer breeding season. Most frogs and toads can be

identified by their calls. Special emphasis should be placed upon documenting the occurrence of high management priority species as described in Current Status and Inventory of Wildlife in Wyoming (1977).

A list of species known to occur in the state and their habitats can be found in Reptiles and Amphibians of Wyoming (1980).

k. Aquatic Sampling

If perennial streams supporting fish populations occur on the proposed permit area, an aquatic study should be conducted by a qualified fisheries biologist to develop biological and physical baseline descriptions. The level of detail required will depend on the quality of the stream(s) to be affected and the degree to which the stream(s) will be impacted. At a minimum, the composition of benthic and fish communities should be determined and the following physical information collected: Stream length within the permit area, stream length to be impacted by mining, gradient, average monthly flows, numbers and average lengths of runs and riffles, average width, average depth, predominant substrate types, meander intervals, the number and average capacity of pools, and standard water quality parameters. Any of this information which already appears in the hydrology section of the permit application may be referenced. A qualitative description of riparian, emergent, and submerged vegetation should also be included.

Stream quality should be described according to the classification system of the Wyoming Game and Fish Department. On most areas under consideration for coal development, streams will either be unclassified or Class 5 (lowest quality) and data requirements will be minimal. No data need be collected from most average livestock impoundments as these man-made structures are generally replaced with equally productive recreationally important fishery prior to mining, the operator should contact the Wyoming Game and Fish Department to determine data collection requirements. Sampling recommendations for various stream types follow:

Stream Classes 1 & 2 (Highest Quality)

Fish: Species occurrence, sample composition, length/weight frequency classes  
Periphyton (artificial substrates): Species occurrence relative abundance, diversity, evenness  
Periphyton (natural substrates): Species occurrence, sample composition  
Benthos: Species occurrence, relative abundance, evenness, diversity, biotic condition index (Winget 1979, cited in GAWS aquatic Survey Handbook. USFWS)

Stream Classes 3 & 4 (Medium Quality)

Same as Classes 1 & 2, with periphyton data on artificial substrates deleted.

Stream Class 5 and Lower

Fish: Species occurrence, sample composition

Benthos: Species occurrence, relative abundance, biotic condition index (see Benthos, Classes 1 & 2 above)

Methods:

a. Fish:

Larger specimens should be sampled by use of a  $\frac{3}{4}$  inch mesh seine and smaller specimens with a  $\frac{1}{4}$  inch mesh seine. Lengths and widths of seines will vary depending on size of the area to be sampled. Dip nets should be used to sample undercut banks, around rocks, aquatic vegetation, and other habitats difficult to sample with a seine. Use of an electrofishing gun is permitted where provided for in the scientific permit. A scientific permit is required and must be obtained through the Director, Wyoming Game and Fish Department. When dealing with larger rivers which are more difficult to sample, species occurrence and a general idea of species composition is sufficient. Game and Fish Department records are often helpful in such situations.

b. Periphyton:

Natural substrates should be scraped and organisms collected in a net placed immediately downstream. Individual organisms may also be picked from substrates. Sampling the natural periphyton community will provide species occurrence data that may otherwise be lacking if only artificial substrates are used.

Artificial substrates (plates) should be used to provide samples for statistical analysis. The plates should be left submerged for 2 to 3 weeks during the summer, or for a period of time sufficient to permit colonization. It is recognized that communities sampled from artificial substrates will differ in composition from natural communities, but such samples may be replicated with greater reliability and will provide a better basis for comparing reclamation results to the premining situation.

c. Benthos:

Sampling should be accomplished with an Eckman dredge or Surber sampler.

d. Water Quality:

The water quality parameters to be measured will vary from case to case, depending upon specific water quality characteristics of the stream(s) and anticipated impacts of the mining operations. Analytic procedures are described in Standard Methods for the Examination of Water and Wastewater. (See "Appropriate Literature" at the end of this guideline).

Appendix D-9 should include an assessment of mining impact on fish population. The Mine and Reclamation Plan should incorporate measures to minimize and avoid damages to fisheries.

B. Use of Game and Fish Department Data

Game and Fish Department data are public information and available to companies free of charge or for reproduction costs. Seasonal distribution information for big and small game has been summarized on 1" per mile or 1/2" per mile overlays for the 1:500,000 scale BLM state land status map or for BLM surface management quads, respectively. These maps may not provide sufficient detail to evaluate big game distribution on small mine sites, but are useful in selection of study sites and in determining seasonal use of potential sites by game animals. Copies of maps may be obtained from the Cheyenne Office of the Game and Fish Department.

Available data can be obtained upon request from field personnel, Game and Fish Department district offices, or the Cheyenne Game and Fish Department office. Data are also available from the Bureau of Land Management and the U.S. Forest Service.

**III. SCIENTIFIC PERMITS**

Scientific permits are required to handle any wildlife species. Permits applicable to most baseline studies include those required for collecting fish, amphibians and reptiles, and for small mammal trapping. These can be obtained via a letter of request to the Assistant Chief Game Warden, (mammals and birds), or the Assistant Chief Fish Warden (fish and herps), State of Wyoming, Game and Fish Department, Cheyenne, WY 82002. The letter should state the time period, the location, the reason for trapping, the species to be trapped, and if removal is to occur, the number of individuals to be removed. A report must be submitted at the end of the calendar year for which the permit is valid. The report should include species trapped and numbers, and locations to the nearest 1/4 section. Failure to submit a report is grounds for denying renewal of the scientific permit.

**IV. APPROPRIATE FEDERAL LAWS**

Companies should be aware of the provisions of the Bald Eagle Act, amended in 1973, which protects bald and golden eagles, their nest's young and eggs. The U.S. Fish and Wildlife Service, the Wyoming Game and Fish Department, and the appropriate land management agency on federal land must be consulted prior to disturbance of eagles or their nests. Disturbances would include any activity conducted close enough to a nest site that the productivity of a breeding pair might be affected. The most direct disturbance would be physical destruction of the nest site. Power lines should be designed to prevent eagle electrocution.

The Endangered Species Act of 1973 protects rare and endangered species of wildlife. Those species on the most current list should receive special attention in premining assessments and in monitoring activities.

Under provisions of the U.S. Fish and Wildlife Coordination Act and Section 404 of the Clean Waters Act, all natural and man-made water sources must be replaced or their loss acceptably mitigated. This requirement applies equally to licensed and unlicensed water sources. Coal-related activities affecting wetlands or streams are subject to U.S. Army Corps Engineers oversight, in accordance with 33 CFR 330.5(a)(21). Corps authorization must be obtained prior to mine permit approval, and an individual 404 permit may be required if the activities do not comply with an existing nationwide permit.

## **V. MONITORING**

Since monitoring is intended to evaluate wildlife problems on permit areas, there is no need for blanket monitoring of all species. Monitoring will be tailored to individual mines. For example, where there are large numbers of antelope, where a mitigation route is bisected by a mine, or where there are several grouse leks on the mine site, monitoring will be needed. These studies will be designed to obtain data in sufficient detail to evaluate the effect of mining on the wildlife species in question and to develop mitigation proposals. Monitoring studies will nearly always be of longer duration than the baseline study.

Proposed monitoring plans should be described within the Mine Plan.

If further information is needed concerning these guidelines, contact:

Game and Fish Department  
Cheyenne, WY 82002  
Phone: (307) 777-7605, or 777-7686

## **APPENDIX**

### **A. Data Presentation in Appendix D-9**

Data presentation in the wildlife section of the Mine Plan should approximate the following scheme:

1. Two types of information should appear in the introduction. The first is a complete description of the baseline study area including its location and size, and the time frame over which the study was conducted. The second is a complete list of individuals and agencies responsible for data collection or consulted to obtain existing data. Specific names of individuals associated with consulting firms and state agencies should be provided. Names of company personnel who collected data need not be listed if the name of a responsible individual to whom inquiries may be sent is provided. Names of the person or persons responsible for assembling the baseline report should be provided.

2. Habitat Description

Habitat should be described both in terms of the major (physical and vegetative) types and the components (rock outcrops, gullies, landform features, water sources, trees, etc.) which affect carrying capacity within each major type. The amount (acreage, density, number, length--as appropriate) of each habitat component and the proportion of each to be disturbed should be tabulated. The interspersions of important habitats and habitat components on the permit area should be depicted on a topographic map of major vegetation communities. Habitat typing should follow the first and second order classifications in the Wildlife Observation System used by the Wyoming Game and Fish Department.

3. Species Lists

A list of wildlife species that potentially occur on the permit area should be provided, and species actually seen on the site should be indicated with an asterisk.

4. Methods and Results

Methods used to sample each faunal group should be described at the beginning of the discussion of results for that group. For example, methods used to sample big game should precede the discussion of big game results. Sufficient detail should be provided so the sample could be replicated by another investigator, or a methods description within the literature should be cited. If data are taken from another baseline study, a description of methods used in that study should be included. The discussion of methods should indicate the intensity of sampling and conditions under which sampling was conducted in each habitat type, and the sample locations should be plotted on a topographic map. When sampling of a particular group of animals has been deleted by prior agreement, a statement to that effect should replace the methods section for that group and the results section should be deleted.

Results and discussion should follow the methods section for each group of animals. It is recommended that baseline data for each group be recorded on the Wyoming Game and Fish Department's Wildlife Observation Forms and copies sent to the area game biologist.

B. U.S. Fish and Wildlife Service Mitigation Program - Raptors and Migratory Bird Species of High Federal Interest.

1. Raptors

The following condition shall be specified whenever mine activities could potentially affect the nest of any raptor species:

Prior to permit approval, and each subsequent renewal, amendment or revision, the operator must consult the U.S. Fish and Wildlife Service to develop (or update) a raptor protection/mitigation plan. The operator shall provide the locations, current status, and reproductive history of each nest on and within two miles of the permit area. The location of each nest in relation to mine disturbance shall be illustrated on a map showing as a minimum, the five year mine progression, and indicating the types of disturbance involved. The U.S. Fish and Wildlife Service shall determine which nests will likely be affected, and monitoring and/or mitigation requirements. The outcome of this consultation, along with a U.S.F.W.S. letter of approval shall be submitted with the permit application or renewal document. If U.S. Forest Service lands are involved, the mitigation plan must be approved by that agency as well. In the event that any new nests are discovered on or within one mile of the permit site during the course of the mining, the operator must consult the U.S. Fish and Wildlife Service to determine if mitigation requirements are necessary. The "take" of a raptor nest with eggs or young should be considered only when no other alternative exists, and after obtaining a special purpose permit from the U.S.F.W.S. The "take" of an inactive nest will also require a special purpose permit ("take" is defined to mean pursue, shoot, shoot at, wound, kill, capture, trap, collect, molest, or disturb).

## 2. Migratory Birds of High Federal Interest (MBHFI)

Several avian species are considered migratory birds of high federal interest and as such, are afforded protection under Chapter II, and Section 2.a.(vi)(G) of the 1986 Land Quality Coal Rules and Regulations. The following procedure must be implemented to assure protection of these species:

The permittee shall survey the permit area and land within ½ mile for occurrence of species listed as migratory birds of high federal interest and for important habitat types such as nest sites, breeding areas, or staging areas essential for continued survival. Appropriate survey techniques will be specified by the U.S. Fish and Wildlife Service upon consultation. If important habitat is identified, the applicant must develop a habitat recovery and replacement plan for protection or enhancement of populations of these species, if they will be affected by habitat loss or displacement due to mine-related activities. The plan must be developed in consultation with, and approved by, the U.S. Fish and Wildlife Service, the Office of Surface Mining, the State of Wyoming, and the surface management agency. Until a mitigation plan is developed and approved, mine-related activities may not cause physical disturbance to a nest site nor may any major surface disturbances be conducted within important habitat identified through the consultation process.

## C. Appropriate Literature

American Public Health Association, American Water Works Association, and Water Pollution Control Federation. 1976. Standard Methods for Examination of Water and Wastewater. American Public Health Association. Washington, D.C. 1193 pp.

HH/5-80; ST/2-87 (revised)  
Rules Update/8-94

- Baxter, G.T., and M.D. Stone. 1980. Reptiles and Amphibians of Wyoming. Wyoming Game and Fish Department. 137 pp.
- Burt, W.H. and R.P. Grossenheider. 1976. A field guide to the mammals. Riverside Press, Cambridge. 284 pp.
- Clark, T.W., T.M. Campbell III, M.H. Schroeder, and L. Richardson. 1983. Handbook of methods for Locating Black-footed Ferrets, January 1984. BLM Wildlife Tech. Bul. No. 1. Cheyenne, Wyoming. 55 pp.
- Dorn, J. 1978. Wyoming Ornithology, a history and bibliography. Wyoming Game and Fish Department and U.S. Bureau of Land Management. 371 pp.
- Findholt, S., B. Oakleaf and B. Long. 1981. Wyoming Mammal Atlas. Wyoming Game and Fish Dept. Cheyenne. 20 pp.
- Fyfe, R.W. and R.R. Olendorff. 1976. Minimizing the dangers of nesting studies to raptors and other sensitive species. Canadian Wildlife Service Occasional Paper No. 23. 17 pp.
- Henderson, F.B., P.F. Springer, and R. Adrian. 1969. The black-footed ferret in South Dakota. S. Dakota Dept. Game, Fish and Parks, Pierre. 37 pp.
- Hickey, J.J. and S.A. Mikol. 1979. Estimating breeding-bird densities on coal lands in Montana and Wyoming. U.S. Fish and Wildlife Service, WELUT, Ft. Collins, Co. 181 pp.
- Long, C.A. 1965. The mammals of Wyoming. U. of Kansas Publs. Museum of Natural History. 14(18):493-758.
- Oakleaf, R., H. Downing, B. Raynes, M. Raynes, and O. Scott. 1979. Wyoming Avian Atlas, Wyoming Game and Fish Dept. 67 pp.
- Olendorff, R.R., A.D. Miller, and R.N. Lehman. 1981. Suggested practices for raptor protection on powerlines - the State of the Art in 1981. Raptor Res. Rep. No. 4, Raptor Research Foundation, Inc. Univ. Minn., St. Paul. 111 pp.
- Postupalsky, S. 1974. Raptor reproductive success: some problems with methods, criteria and terminology. Page 21-31 IN R.N. Hammerstrom Jr., B.E. Harrell and R.R. Olendorff, eds., Management of raptors. Proc. Cong. Raptor Conser. Tech., Raptor Res. Rep. No. 2. 146 pp.
- Robbins, C.S., B. Bruun, H.S. Zim, and A. Singer. 1966. Birds of North America. Golden Press. 340 pp.

- Rothwell, R., G. Skutches, J. Straw, C. Sax, and H. Harju. 1978. A partial bibliography of the mammals of Wyoming and adjacent states. Wyoming Game and Fish Department and U.S. Bureau of Land Management. 172 pp.
- Tessman, S.A. 1984. Habitat reclamation procedures for surface coal mines in Wyoming in R.D. Comer, J.M. Merina, J.W. Monarch, C. Pustmueller, M. Stalmaster, J. Todd, and W. Wright, Eds. Issues and Technology in the Management of Impacted Western Wildlife. Proc. Symp., Thorne Ecological Institute. Boulder, Colorado. 250 pp.
- The Wildlife Society. 1980. Wildlife management techniques. Wildlife Society, Washington, D.C.
- Winget, R.N. and F.A. Mangum. 1979. Biotic Condition Index: Integrated Biological, Physical, and Chemical Stream Parameters for Management. USDA, Forest Service, Provo, Utah 84601. 51 pp.
- Udvardy, M.D.F. 1977. The Audubon Society Field Guide to North American Birds, Western Region. Knopf, New York. 853 pp.
- Whitaker, J.O. 1980. The Audubon Society Field Guide to North American Mammals. Knopf, New York. 745 pp.
- Wyoming Game and Fish Department. 1976. Considerations for Wildlife.
- Wyoming Game and Fish Department. 1982. Handbook of Biological Techniques.
- Wyoming Game and Fish Department. 1980. Wildlife Observation System User's Manual. 39 pp.