

ENDANGERED SPECIES ACT--SECTION 7 CONSULTATION

BIOLOGICAL OPINION and CONFERENCE REPORT

AGENCY: U.S. Department of the Interior, Office of Surface Mining Reclamation and Enforcement (OSM)

ACTIVITY: Surface Coal Mining Regulatory Programs Under the Surface Mining Control and Reclamation Act of 1977, P.L. 95-87 (SMCRA or the Act)

Consultation conducted by: U.S. Department of Interior, U.S. Fish and Wildlife Service (the Service)

Date Issued: _____

BIOLOGICAL OPINION/CONFERENCE REPORT

Description of Proposed Action

The proposed action is the approval and conduct of surface coal mining and reclamation operations under State and Federal regulatory programs adopted pursuant to SMCRA where such operations may adversely affect threatened or endangered species. At present, 24 States (Alabama, Alaska, Arkansas, Colorado, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maryland, Mississippi, Missouri, Montana, New Mexico, North Dakota, Ohio, Oklahoma, Pennsylvania, Texas, Utah, Virginia, West Virginia, and Wyoming) have approved State regulatory programs (primacy) under SMCRA for non-Federal, non-Indian lands within their borders. OSM administers Federal regulatory programs for 13 States (Arizona, California, Georgia, Idaho, Massachusetts, Michigan, North Carolina, Oregon, Rhode Island, South Dakota, Tennessee, and Washington), although only Tennessee and Washington have active coal mines at the present time. OSM directly regulates all surface coal mining and reclamation operations on Indian lands, which at present consist of operations on the Navajo, Hopi, and the Ute Mountain Ute reservations. On the Crow Ceded Area in Montana, OSM and the Montana Department of State Lands administer applicable surface mining requirements. OSM also directly regulates surface coal mining and reclamation operations on Federal lands in primacy States (most significantly Kentucky) that have not entered into cooperative agreements with the Secretary of the Interior to assume this responsibility.

As of June 1, 1996, a total of 308 species listed as threatened or endangered occur within States with primacy, and 337 listed species occur within States with Federal regulatory programs. Surface coal mining and reclamation operations would potentially impact only a subset of these species.

Background

Surface Mining Regulation Under SMCRA

In fashioning SMCRA, Congress recognized the need to protect society and the environment from the adverse effects of surface coal mining operations while fulfilling the nation's need for coal. Signed into law on August 3, 1977, SMCRA was the first Federal statute specifically directed toward regulation of the environmental impacts associated with surface coal mining. The Act created two major programs:

- A reclamation program for abandoned mine lands, funded by fees that operators pay on each ton of coal mined; funds are used to reclaim land and water resources adversely affected by pre-1977 coal mining; and
- An environmental protection program to establish standards and procedures for permitting and inspecting surface and underground coal mining and reclamation operations. This program has five major components:
 - (1) Criteria and procedures for designation of areas as unsuitable for mining;
 - (2) Performance standards governing the conduct of mining and reclamation operations;
 - (3) A detailed permitting process to ensure that mining and reclamation operations are designed to achieve the performance standards and other requirements of SMCRA and its regulations;
 - (4) A performance bond to provide a financial guarantee for completion of the reclamation plan if the permittee defaults on reclamation obligations; and
 - (5) Inspection and enforcement to monitor and secure compliance.

State Regulatory Programs

Section 101(f) of SMCRA specifies that because of the diversity in terrain, climate, and other physical conditions under which mining operations occur, the primary governmental responsibility for regulating surface coal mining and reclamation operations should rest with the States. To achieve primary regulatory responsibility (often referred to as primacy), a State must develop and obtain OSM approval of a program which demonstrates the State's capability to carry out applicable provisions of SMCRA. Specifically, State programs must include:

- Laws which regulate surface coal mining and reclamation operations;
- Sanctions for violations of State laws, regulations, or permit conditions;

- Plans for implementation, maintenance, and enforcement of an effective permit system;
- A process for the designation of areas as unsuitable for surface coal mining operations;
- A process for coordinating the review and issuance of surface coal mining permits with any other Federal or State permitting requirements applicable to the proposed operations;
- Rules and regulations consistent with regulations issued by the Secretary of the Interior (the Secretary); and
- Sufficient administrative and technical personnel and funding to operate a regulatory program.

Through OSM, the Secretary reviews the proposed State program to determine its consistency with SMCRA and the implementing regulations adopted by the Secretary. Each State program is also reviewed by the public, industry, and other Federal agencies. After soliciting and publicly disclosing the views of the Environmental Protection Agency, the Secretary of Agriculture, and heads of other Federal agencies, the Secretary either approves or disapproves the proposed State program. Upon program approval, the State becomes the primary regulatory authority for surface coal mining and reclamation operations within its borders. As of the date of this document, 24 States have primacy. These States are responsible for 98 per cent of the nation's surface coal mining and reclamation operations.

Oversight of State Regulatory Programs

Following approval of a State program, OSM assumes a monitoring role and provides funding and technical assistance. Section 517(f) of SMCRA requires that OSM evaluate the administration of approved State programs. In this role, OSM conducts oversight inspections of selected minesites and undertakes oversight reviews of selected topics in States with primacy.

Federal Regulatory Programs

As required by section 504 of SMCRA, OSM directly regulates surface coal mining and reclamation operations in a State if the State does not submit and receive approval of its own program pursuant to section 503 of SMCRA. As of the date of this document, OSM operates Federal regulatory programs in 13 States, although only Tennessee and Washington have active mines.

Federal and Indian Lands

Section 523(a) of SMCRA requires the Secretary to establish and implement a Federal regulatory program applicable to all surface coal mining and reclamation operations taking place on Federal lands. Through cooperative agreements, the Secretary has delegated most regulatory responsibilities under this provision to States with approved regulatory programs. The Secretary has entered into cooperative agreements with Alabama, Colorado, Illinois, Montana, New Mexico, North Dakota, Ohio, Oklahoma, Utah, Virginia, West Virginia, and Wyoming. Among States without cooperative agreements, only Kentucky has significant mining activity on Federal lands.

Pursuant to section 710 of SMCRA, OSM directly regulates all surface coal mining and reclamation operations on Indian lands, which, at present, consist of operations on the Navajo, Hopi, and Ute Mountain Ute reservations. On the Crow Ceded Area in Montana, OSM and the Montana Department of State Lands administer applicable requirements.

Status of the Species

This biological opinion and conference report addresses all present and future Federally listed and proposed species and designated or proposed critical habitats that may be affected by the implementation and administration of surface coal mining regulatory programs under SMCRA. The Service's field offices will maintain and update a list of protected species and habitats and the specific measures needed to ensure the protection of these species and habitats. The Service will routinely distribute this list and any updates to OSM and State regulatory authorities.

A complete list of endangered and threatened wildlife and plants and critical habitats appears at 50 CFR 17.11 and 17.12. The preambles to the proposed and final listing rules contain detailed status information for each species. Individual species recovery plans, reports, and other documents contain additional information.

Effect of Proposed Action

The effect of surface coal mining and reclamation operations on plant and animal communities depends on the nature of the affected plant, animal, or critical habitat, the type of mining and its intensity, reclamation techniques and timing, the seral history of the site, and postmining land use. Generally, these activities can result in impacts such as changes in pH (acidification or alkalization of waters and/or soils); siltation of bodies of water such as lakes, ponds, rivers, streams and creeks; increased turbidity of water bodies, thus reducing primary productivity; deposition of metals in water bodies; and synergistic effects of mining wastes with other pollutants (Mason 1978). In some cases, surface coal mining and reclamation activities may have contributed to the endangerment of species.

Direct effects of surface coal mining and reclamation operations on threatened, endangered, or proposed species or critical habitats consist primarily of habitat alteration by land clearing and

earthmoving operations. While some of these effects are temporary, unique habitat features in such microenvironments as cliffs, caves, rock outcroppings, seeps, and old-growth forests are difficult and sometimes impossible to replace (Thornburg 1982). Aquatic and wetland-dependent species also may be directly affected by adverse impacts on water availability and quality (e.g., increased levels of metals, sulfates and dissolved or suspended solids), increased variations in streamflow and thermal gradients, and changes in groundwater levels and spring flows (USDA 1982). If the species of concern lacks individual mobility, land clearing and excavation activities may result in a direct take. Direct effects are often readily identifiable, but the magnitude of incidental take resulting from both direct and indirect impacts is difficult to ascertain and not well-documented.

Surface coal mining and reclamation operations may indirectly affect threatened, endangered, or proposed species or proposed or designated critical habitats by increasing human access to species and/or their habitats and by causing or contributing to long-term changes in land use and the local ecology. Improved access can result in increased site disturbance, poaching, and invasion of species incompatible with the species of concern. Mining can interrupt migration corridors and habitat continuity (Mason 1978), thus isolating populations and threatening their long-term viability by increasing their susceptibility to genetic decline and catastrophic events. Forest fragmentation resulting from mining-related activities and subsequent changes in land use may cause increased predation and habitat degradation on adjacent, physically undisturbed sites and may threaten the ecological integrity of those lands with respect to species requiring extensive continuous forest cover. Even if the land is restored to its premining use, the species composition and age structure will likely differ; this may have an adverse impact on species of concern. Hence, surface coal mining and reclamation operations may result in an indirect take of a protected species or significant disturbance and/or destruction of protected habitats.

As summarized below, SMCRA and its implementing regulations set forth programmatic standards and procedures designed to minimize mining-related impacts on fish and wildlife in general and threatened and endangered species in particular. OSM, State regulatory authorities under SMCRA, State fish and game or conservation agencies, and local Service offices must develop additional species-specific or site-specific standards and procedures if needed to protect listed and proposed species, their habitats, and designated or proposed critical habitats.

Regulatory Requirements Under SMCRA

Section 501 of SMCRA requires the Secretary to promulgate regulations for surface coal mining and reclamation operations based on and conforming to Title V of SMCRA. These regulations are codified in Title 30, Chapter VII of the Code of Federal Regulations. The specific regulations pertinent to protection of fish and wildlife and related environmental values are summarized below:

§ 772.12 *Permit requirements for exploration removing more than 250 tons of coal, or occurring on lands designated unsuitable for surface coal mining operations.*

Paragraph (b)(9) requires a description of any endangered or threatened species listed pursuant to the Endangered Species Act of 1973 and identified within the proposed exploration area.

Paragraph (d)(2)(ii) requires that the regulatory authority (State or OSM) find in writing that the exploration and reclamation activities described in the application will not jeopardize the continued existence of an endangered or threatened species or result in the destruction or adverse modification of critical habitat of those species.

§ 815.15 Performance standards for coal exploration.

Prohibits disturbance of habitats of unique or unusually high value for fish, wildlife, and other related environmental values and critical habitats of threatened or endangered species during coal exploration.

§ 773.12 Regulatory coordination with requirements under other laws.

To avoid duplication, requires that each regulatory program provide for the coordination of review and issuance of permits with applicable requirements of the Endangered Species Act, the Fish and Wildlife Coordination Act, the Migratory Bird Treaty Act, and the Bald Eagle Protection Act.

§§ 780.16 and 784.21 Fish and wildlife information.

Paragraph (a) requires that each permit application include fish and wildlife resource information for the permit and adjacent area, including site-specific information when the permit or adjacent area is likely to include listed or proposed endangered or threatened species. The scope and level of detail for the information must be determined by the regulatory authority in consultation with the State and Federal agencies with responsibilities for fish and wildlife.

Paragraph (b) requires that each permit application include a description of how the operator will minimize disturbances and adverse impacts on fish and wildlife and related environmental values, including compliance with the Endangered Species Act. The application also must include a plan for enhancement of these resources where practicable.

Paragraph (c) provides that upon request by the Service, the regulatory authority must supply the information required under paragraphs (a) and (b) to the Service for review.

§ 773.13 Public participation in permit processing.

§ 774.13 Permit revisions.

§ 774.15 Permit renewals.

Requires the regulatory authority (State or OSM) to provide written notification to State and Federal fish and wildlife agencies whenever the State or OSM receives an application for a new permit, significant revisions of a permit, or permit renewal. Further, the regulatory authority must document consideration of all comments received in response to these notifications.

§ 773.15 Review of permit applications.

As a precondition for approval of a permit application, paragraph (c) requires the regulatory authority to make a written finding that the proposed operation would not affect the continued existence of endangered or threatened species or result in destruction or adverse modification of their critical habitats, as determined under the Endangered Species Act.

§ 774.13 Permit revisions.

§ 774.15 Permit renewals.

For significant revisions, requires the regulatory authority to make the same findings as for permit approval. For renewals, requires the regulatory authority to approve the application for renewal unless it finds in writing that the existing permit is not in compliance with applicable requirements, e.g., environmental protection standards.

§§ 816.97 and 817.97 Protection of fish, wildlife, and related environmental values.

Paragraph (a) requires the operator to minimize disturbance of and adverse impacts on fish, wildlife, and related environmental values.

Paragraph (b) prohibits the taking of an endangered or threatened species in violation of the Endangered Species Act and prohibits mining activity which is likely to jeopardize the continued existence of endangered or threatened species. Under this rule, the operator must promptly notify the regulatory authority of the presence of a protected species within the permit area. The regulatory authority must consult with appropriate State and Federal fish and wildlife agencies to determine whether and under what conditions the operation may proceed.

Paragraph (f) requires that the operator avoid disturbances to, enhance where practicable, and restore habitats of unusually high value for fish and wildlife.

Cumulative Effects

Cumulative effects include the effects of future State, Tribal, local, or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate section 7 consultations.

Consideration was given to analyzing the cumulative effects of the proposed action for activities conducted under the auspices of SMCRA. However, such an analysis is impractical at this scale because it is impossible to identify and quantify with any degree of confidence or accuracy where future State, Tribal, local, and private actions that are both reasonably certain to occur and that would have an effect on listed species. Such an analysis will be more practical and meaningful at the site-specific level.

Conclusion

After reviewing SMCRA, its implementing regulations, the effects of the proposed action, and the cumulative effects, it is the Service's biological opinion that surface coal mining and reclamation operations conducted in accordance with properly implemented Federal and State regulatory programs under SMCRA are not likely to jeopardize the continued existence of listed or proposed species, and are not likely to result in the destruction or adverse modification of designated or proposed critical habitats. This conclusion is based on compliance with, but not limited to, 30 CFR 772.12 [which requires a description of any endangered or threatened species listed pursuant to the Endangered Species Act of 1973 and identified within the proposed exploration area. Paragraph (d)(2)(ii) of 30 CFR 772.12 also requires that the regulatory authority (State or OSM) find in writing that the exploration and reclamation activities described in the application will not jeopardize the continued existence of an endangered or threatened species or result in the destruction or adverse modification of critical habitat of those species]; 773.12 [this provision requires coordination of review and issuance of mining permits with all applicable requirements of the Endangered Species Act]; 773.13, 774.13, and 774.15 [these provisions require the regulatory authority (State or OSM) to provide written notification to State and Federal fish and wildlife agencies whenever the State or OSM receives an application for a new permit, significant revisions of a permit, or permit renewal. Further, the regulatory authority must document consideration of all comments received in response to these notifications]; 815.15 [this provision requires that habitats of unique environmental value, including but not limited to critical habitats of listed species shall not be disturbed during coal exploration]; 780.16 and 784.21 [these provisions require the gathering of an adequate information base to address effects of mining operations on listed species and other environmental values, the development of an enhancement and protection plan that includes necessary measures that will be implemented during all phases of mining to minimize effects on listed species and other environmental resources, and a provision for the Service to request the review of a mining permit application and accompanying documentation.]; 816.97, and 817.97 [these provisions require operators to minimize disturbance of and adverse impacts on fish, wildlife, and related environmental values. Furthermore, these provisions prohibit the taking of an endangered or threatened species in violation of the Endangered Species Act and prohibits mining activity which is likely to jeopardize the continued existence of endangered or threatened species. The regulatory authority must consult with appropriate State and Federal fish and wildlife agencies to determine whether and under what conditions the operation may proceed]. These requirements will avoid jeopardizing any listed species or adversely modifying any designated critical habitat in violation of the Endangered Species Act. Furthermore, these regulations require, whenever feasible, the enhancement of wetlands and wildlife habitat, thus potentially aiding in the recovery of listed species.

INCIDENTAL TAKE STATEMENT

Incidental Take

Sections 4(d) and 9 of the Endangered Species Act of 1973 (ESA), as amended, prohibit the taking (harassment, harm, pursuit, hunting, shooting, wounding, killing, trapping, capture, or collection or attempt to engage in any such conduct) of listed species of fish and wildlife without a special exemption. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering. Harassment is defined as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns, which include, but are not limited to, breeding, feeding, or sheltering.

Incidental take is any take of listed wildlife species that results from, but is not the purpose of, an otherwise lawful activity conducted by a Federal agency or the recipient of a Federal grant or permit. Under the terms of §§ 7(b)(4) and 7(o)(2) of the ESA, a taking that is incidental to and not intended as part of the agency action is not a prohibited taking if the taking is in compliance with the terms and conditions of the incidental take statement. When a particular activity may result in the take of a listed species but not at a level that would jeopardize the existence of that species, the Service must determine the anticipated level of take, if possible, and provide reasonable and prudent measures for minimizing that take.

For the exemption in section 7(o)(2) of the ESA to apply, OSM and State regulatory authorities must fully regulate the activity covered by this incidental take statement. If the regulatory authority (1) fails to require permittees to adhere to the terms and conditions of the incidental take statement, including, when necessary, the addition of site-specific permit terms or conditions, or (2) OSM fails to monitor compliance with the incidental take statement's terms and conditions through program evaluation activities, the protective coverage of § 7(o)(2) of the ESA may lapse.

Sections 7(b)(4) and 7(o)(2) of the ESA do not apply to the incidental take of listed plant species. However, protection of listed plants is provided to the extent that the ESA requires a Federal permit for removal or reduction to possession of endangered plants from areas under Federal jurisdiction; for any act that would remove, cut, dig up, or damage or destroy any such species on any area in knowing violation of any regulation of any State; or in the course of any violation of State law (e.g., criminal trespass law) or Federal law (e.g., SMCRA).

Amount or Extent of Take

The Service does not expect discovery of a precise number of dead or sublethally affected individuals of protected species attributable to the proposed action. Therefore, the Service is assigning an "unquantifiable" level of take to the proposed action. This indicates that the Service believes that the proposed action will result in an unavoidable taking of some individuals, but that the level of take cannot be determined with numerical precision.

Effect of Take

In this biological opinion, the Service has determined that the level of anticipated take is not likely to result in jeopardy to any listed species or result in the destruction or adverse modification of designated critical habitats. If the proposed action is implemented as proposed in accordance with SMCRA and the applicable approved regulatory program, listed species will not be jeopardized.

To insure protection for species expected to be taken at an unquantifiable level, the Service must have a mechanism to develop, in close coordination and cooperation with OSM and State regulatory authorities, any necessary site-specific measures to minimize potential take. These measures must be enforceable under the mining permit.

If the permittee or another party discovers a dead specimen of a protected species, and the death is attributable to the regulated action, the regulatory authority must reevaluate the operation and reclamation plan in the approved permit to determine if corrective action is necessary to avoid a recurrence of the circumstances that resulted in the inadvertent take. If a take above the authorized level occurs while following the measures developed to minimize the expected take, the take is not a violation of § 9 of the ESA.

Surface coal mining and reclamation operations have the potential to adversely affect listed and proposed species and may result in the incidental take of listed species. However, as summarized under "**Effect of Proposed Action**," the State and Federal regulations implementing SMCRA require that the regulatory authority adheres to a planning and coordination process to minimize the likelihood and extent of incidental take by both existing and future surface coal mining and reclamation operations. This process includes the identification of measures to minimize incidental take, and, if needed, the imposition of permit terms or conditions to implement these measures.

The Service has developed geographically-specific documents that address the environmental effects of coal mining. More importantly, these documents provide general guidance for developing measures to minimize impacts on protected species (USFWS publications FWS/OBS 83/08 through 12 and 83/35).

Surface coal mining and reclamation operations in existence when a species is listed or critical habitat is designated need not cease operation pending submission and approval of a permit revision so long as mining and reclamation activities are conducted in accordance with any species-specific standards and protective measures approved by the Service and the regulatory authority. Until such measures are developed and approved, existing surface coal mining and reclamation operations may continue provided they adhere to all requirements of the approved SMCRA regulatory program.

This document is generic. It applies to both current and future listed species and critical habitats. It does not identify incidental take and measures to reduce such take for specific species. The regulations at 30 CFR Chapter VII and their State program counterparts provide adequate assurance that the SMCRA permitting, inspection, and enforcement processes and associated coordination requirements will minimize incidental take. As a condition of this non-jeopardy opinion and incidental take statement, the Service and the appropriate regulatory authority, acting in accordance with the applicable State, Federal, or Federal and Indian lands program, must develop species-specific measures to minimize anticipated incidental take. When necessary, the regulatory authority must exercise its authority under 30 CFR 774.11(b) (or the State program equivalent) to require reasonable revision of a permit at any time to ensure compliance with the threatened and endangered species protection provisions of the approved SMCRA regulatory program.

Reasonable and Prudent Measures

The Service believes that the following reasonable and prudent measure and its implementing terms and conditions are necessary and appropriate to minimize the expected incidental take resulting from implementation of the proposed action:

OSM and State regulatory authorities must implement all of the terms and conditions set forth below.

Terms and Conditions

To be exempt from the prohibitions of § 9 of the ESA, SMCRA regulatory authorities must comply with the following terms and conditions:

1. The regulatory authority, acting in accordance with the applicable SMCRA regulatory program, must implement and require compliance with any species-specific protective measures developed by the Service field office and the regulatory authority (with the involvement, as appropriate, of the permittee and OSM).
2. Whenever possible, the regulatory authority must quantify the take resulting from activities carried out under this program. Whenever a dead or impaired individual of a listed species is found, the local Service office must be notified within one (1) working day of the discovery.
3. Whenever the regulatory authority decides not to implement one or more of the species-specific measures recommended by the Service, it must provide a written explanation to the Service. If the Service field office concurs with the regulatory authority's action, it will provide a concurrence letter as soon as possible. However, if the Service does not concur, the issue must be elevated through the chain of command of the regulatory authority, the Service, and (to the extent appropriate) OSM for resolution.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Endangered Species Act directs Federal agencies to further the purposes of that Act by implementing conservation programs for the benefit of endangered and threatened species to the extent that the agencies have the authority to do so. The Service may make discretionary conservation recommendations to other Federal agencies to minimize or avoid the adverse effects of a proposed action on listed species or critical habitat. These recommendations may include assistance in recovery plan implementation and monitoring and information collection efforts.

The Service recommends that OSM, in partnership with the States, develop draft candidate species conservation guidelines and procedures where those species are affected by OSM-regulated operations. The Service is committed to providing technical assistance to both OSM and the States in such an endeavor.

The Service will appreciate notification of the implementation of conservation recommendations.

REINITIATION OF CONSULTATION

This concludes formal consultation and conference on OSM's proposed action. As provided in 50 CFR 402.16, reinitiation of formal consultation is required when discretionary Federal agency involvement or control over the action has been maintained (or is authorized by law) and if (1) new information reveals that the agency action may affect listed species or critical habitats in a manner or to an extent not considered in this opinion, or (2) the agency action is modified in a manner that causes an adverse effect to listed species or critical habitat that was not considered in this opinion. This biological opinion and conference report does not absolve the action agency from complying with statutory procedures.

LITERATURE CITED

- Mason, W.T. (ed.) 1978. Methods for the assessment and prediction of mineral mining impacts on aquatic communities: A review and analysis. Workshop Proceedings. FWS/OBS - 78/30 157pp.
- Thornburg, A.A. 1982. Plants and materials for use on surface-mined lands in arid and semi-arid regions. USDA, SCS, SCS-TP-157, EPA600/7-79-134. 88pp.

- U.S. Department of Agriculture (USDA) 1982. Wildlife user guide for mining and reclamation. Gen. Tech. Rep. INT-126. Ogden, UT: USDA, Forest Service, Intermountain Forest and Range Experimental Station. 77pp.
- U.S. Fish and Wildlife Service (USFWS) 1983. Practices for protecting and enhancing fish and wildlife on coal surface-mined land in central and southern Appalachia. FWS/OBS-83/08. 208pp.
- . 1983. Practices for protecting and enhancing fish and wildlife on coal surface-mined land in the Green River-Hams Fork region. FWS/OBS-83/09. 242pp.
- . 1983. Practices for protecting and enhancing fish and wildlife on coal surface-mined land in the Powder River-Fort Union region. FWS/OBS-83/10. 246pp.
- . 1983. Practices for protecting and enhancing fish and wildlife on coal surface-mined land in the South-central United States. FWS/OBS-83/11. 229pp.
- . 1983. Practices for protecting and enhancing fish and wildlife on coal surface-mined land in the Uinta-Southwestern Utah region. FWS/OBS-83/12. 250pp.
- . 1983. Impacts of coal surface mining on 25 migratory bird species of high Federal interest. FWS/OBS-83/35. 348pp.