

## CHAPTER 5 - SPECIAL CONSULTATIONS AND REVIEWS

The following procedures facilitate section 7 compliance for complex programs or specialized situations.

### 5.1 PROACTIVE CONSERVATION REVIEWS - Section 7(a)(1)

*The Secretary shall review other programs administered by him and utilize such programs in furtherance of the purposes of this Act. All other Federal agencies shall, in consultation with and with the assistance of the Secretary, utilize their authorities in furtherance of the purposes of this Act by carrying out programs for the conservation of endangered species and threatened species listed pursuant to section 4 of this Act.*

Section 7(a)(1) of the Endangered Species Act

Implementation of section 7(a)(1) needs to be closely coordinated with the section 7(a)(2) consultation program. FWS offices and other agencies have recognized the need for, but have yet to request, such a review of major national programs.

This type of programmatic review is also appropriate for Federal agency planning and program management documents (e.g. BLM Resource Area Management Plans, Forest Timber Program Planning Documents). Often in these cases there is not enough specific information about on-the-ground impacts to determine if there would be an adverse effect from a specific project and what the amount of incidental take might be. By identifying potential program effects and developing guidelines to minimize these effects to listed species and designated critical habitats, subsequent "stepped-down" consultations, where more specific effects on species can be determined within the context of a local geographical area, can be done more expediently (see also section 5.4 regarding Streamlined Consultations).

Ultimately, these conservation reviews should provide the agency with concurrence on, or recommendations for, a blueprint for conservation activities including section 7(a)(2) consultation, section 10 permits, assistance in developing and implementing recovery plans, and assistance in candidate monitoring and management programs. Initial efforts will address the consultation component, and examples will be provided as they become available. For the time being, such conservation reviews are confined to national programs (plans, regulations) and will be conducted or coordinated by the Washington Office of both Services.

## **5.2 NATIONAL CONSULTATIONS - Section 7(a)(2)**

Increasingly, the Services are requested to consult on an action or series of actions affecting many species over all or a major portion of the country. Examples have included: the U.S. Department of Agriculture's Animal and Plant Health Inspection Service (APHIS) Animal Damage Control program addressing most of that office's activities nationwide; and the Environmental Protection Agency's (EPA) pesticide registration program. Within the FWS, these consultations have been addressed by one or more teams from the Regions, with the lead assigned to one Region or the Washington Office. National consultation documents will be signed in the FWS Washington Office. Within the NMFS, these consultation documents are addressed and signed in the Washington Office of Protected Resources.

These consultations differ from "conservation reviews" (see (A) above) in that (1) specific species affected by the action can be identified; (2) specific actions affecting these species can be described; (3) the effects of the action on the species can be determined during consultation; and (4) the consultation fulfills an agency's obligation under section 7(a)(2). If a federal action affects both NMFS and FWS species, it is appropriate to conduct a joint consultation and issue a joint opinion (see Appendix C for an example of a joint consultation). Joint consultation documents should be addressed and signed at the Washington Office level of both Services.

Successful conduct of these consultations requires the Regions to provide strong support to the development of these opinions, including funding and staff time to complete assigned portions of the work, and the Washington Office to designate a liaison to facilitate the consultation.

Program-specific protocols have been developed for recurring national consultations, like EPA's pesticide registration program.

### **(A) Pesticide consultations (FWS)**

As the action agency responsible for most pesticide registrations, U.S. Environmental Protection Agency is usually the agency that requests consultation on these activities. Occasionally, other agencies (e.g., U.S. Food and Drug Administration) may also request consultation on chemicals with pesticidal effects under their jurisdiction for review of their effects on listed species. These consultations review the potential effects of all registered uses of pesticides on listed species. EPA has combined several pesticides into a single request. Occasionally, EPA may request case-by-case consultation on a specific pesticide when conditions warrant.

This section describes general procedures the FWS follows while reviewing Environmental Protection Agency's registration of pesticides under the Federal Insecticide, Fungicide, and Rodenticide Act. This guidance is intended to facilitate the efficient and effective completion of these consultations and improve coordination among the FWS's Field, Regional, and Washington

offices. This guidance will facilitate the evaluation of potential impacts to Federally listed species from the use of pesticides.

Registration of pesticides is an action with potentially broad geographical effects perhaps making these consultations the most complex type of consultation the FWS deals with under section 7. Because of their technical complexity the FWS has utilized National teams to conduct these consultations.

The current FWS national pesticide consultation team consists of (1) a team leader from the Division of Endangered Species in the Washington Office (DTE), (2) at least one biologist from each of Regions 1-6, and (3) a subteam of both Regional and Field Office Environmental Contaminants staff, as necessary, led by a biologist from the Division of Environmental Contaminants in the Washington Office (DEC).

The team leader is responsible for initial contacts and coordination with EPA in preparing their initiation package. Upon receipt of the initiation package, the team leader will promptly distribute copies to all team members and request technical review from the DEC technical subteam. Concurrently the team leader will notify EPA of receipt of their initiation package and will provide EPA with a timeline for completion of the FWS's evaluation of the package. If the FWS's review cannot be completed within the expected timeframe it is the responsibility of the team leader to request an extension from EPA. This review of the initiation package could have one of two outcomes. First the FWS may accept the package as adequate to formulate the necessary biological opinions, in which case the team leader will notify EPA, in writing, acknowledging initiation of formal consultation and providing an expected timeframe for completion of the biological opinion. Another possible outcome of this review could be the determination by the FWS that the initiation package does not provide adequate information for the FWS to develop a biological opinion. In such a case the team leader will provide EPA, in writing, with a rationale for the FWS's determination and also clear guidance on how EPA should supplement its initiation package to be satisfactory for the development of the necessary biological opinions.

Section 7 regulations allow 90 days to conduct formal consultation and an additional 45 days to complete the biological opinion, for a total of 135 days from receipt of the initiation request to delivery of the biological opinion. Given the workload involved in conducting pesticide consultations, these consultations generally cannot be completed within the regulatory timeframe. DTE negotiates an acceptable timeframe for completing national pesticide consultations and requests extensions, as necessary, based on recommendations from team members.

When initiation is acknowledged, DTE's responsibility as team leader is to ensure that all team members have access to all necessary and pertinent information, coordinate all team meetings and workshops, and facilitate information exchange among team members, DEC, and EPA.

Each team member is responsible for evaluating all listed and proposed species and designated or proposed critical habitats for which their Region has the lead. Each team member will develop the necessary biological opinions and submit them to the team leader for incorporation into a draft biological opinion. Once a draft opinion is developed it will be provided to DEC for their review. DEC's role at this stage of the consultation is to review the draft opinion for technical accuracy and comment on the technical feasibility of the reasonable and prudent alternatives or measures or both. Once the draft opinion has been reviewed, it will be provided to EPA for EPA's review and comment.

As soon as the team leader receives EPA's comments on the draft opinion, the team leader will transmit such comments to all team members and to DEC's technical subteam for their review and consideration. DEC's role at this stage would be to aid the team in evaluating EPA's comments on the draft opinion and suggesting courses of action to address EPA's comments. DTE's role at this stage is to facilitate the dialogue among DEC, National team members, and EPA on how to best address EPA's comments and develop the final opinion with implementable reasonable and prudent alternatives and measures. Each team member is responsible for editing or amending, as necessary, the portions of the opinion they developed. After all the team members have completed the necessary amendments to the opinion, they submit their work to the team leader for final review by both DEC and DTE prior to signature and transmittal to EPA.

Future EPA or other agency pesticide consultations will probably follow this general format. However, modifications will be made, as necessary, to continually improve the process and accommodate any special circumstances, if warranted.

### **(B) Other national consultations**

Several other programs will probably generate national consultation requests. For example, State and tribal programs to assume administration of section 404 of the Clean Water Act may require development of specific national consultation procedures.

## **5.3 REGIONAL OR ECOSYSTEM CONSULTATIONS**

Action agencies occasionally request multi-action and "ecosystem-based" consultations. These consultations may be step-downs of conservation reviews or national consultations. For FWS, a lead Region or field office may be designated. Regional and ecosystem biological opinions may be signed at the FWS Regional or Field Office level, as appropriate. For NMFS, these consultations are addressed by a lead Region for the Office of Protected Resources, and signed by the Washington Office Director, Protected Resources, except where signature has been delegated to a specific Region. Examples of these consultations include:

**Regional:**

- o U.S. Department of Agriculture's Animal and Plant Health Inspection Service (APHIS) program to eradicate the boll weevil in southern cotton growing states, to control grasshoppers and crickets in western states, or to control Mediterranean fruit flies in the Southwest.

**Ecosystem:**

- o An FWS Region 6-led consultation on the continuing operations of all Corps dams on the Missouri River and their effects on listed species within that aquatic ecosystem (bald eagle, piping plovers, interior least terns and the pallid sturgeon).
- o An FWS Region 3 consultation on operation of Corps facilities along the breadth of the Upper Mississippi River.
- o An FWS Region 2-led consultation with the Bureau of Reclamation on regulations to implement water entitlements on the Lower Colorado River.
- o An FWS Region 1-led consultation with the BLM on grazing activities throughout the range of the desert tortoise, and other program activities within the proposed critical habitat.

Consideration should be given to conducting ecosystem-based consultations, particularly in areas undergoing large HCPs, with the Federal agencies whose future activities may affect one or more species within a regional planning area. This type of consultation would involve programmatic review of the agencies' activities and would be most effective if conducted simultaneously with development of the HCP. Such an approach could involve a single lead agency, if there is a predominant Federal agency influence (e.g., the Bureau of Reclamation in the Central Valley of California), or could involve a limited number of agencies representing Federal programs in the planning area. Such simultaneous consideration of both Federal and non-Federal programs could (1) assist in assessing overall effects on a species/group of species/ ecosystem from multiple actions; (2) result in a better determination of the respective roles of all the parties in conserving the species/ecosystem, (3) assist in determining the priority of all proposed actions for use of any "resource cushion" that may exist, and (4) demonstrate that all parties are being provided equal consideration at equal speed (programmatic consultations do not have applicants and are subject to mutually agreed timeframes).

## **5.4 STREAMLINED CONSULTATIONS**

### **(A) Activities in the Pacific Northwest**

In March of 1995, FWS, NMFS, the Forest Service, and the Bureau of Land Management released a jointly-developed consultation timeline and streamlining process for accomplishing forest health projects and salvage timber harvest in Washington, Oregon, Idaho, and California. In February of 1997 a revised Streamlining Procedures Consultation Guidance was released (See Appendix A for copies of the agreement and the Guidance document). The process utilizes interagency teams to work together in the early stages of project planning, and to complete consultation on projects within the timeframes needed to meet the requirements of the National Environmental Policy Act. The process provides for consultation to occur simultaneously with project planning and development under NEPA by the action agency. Informal consultations are to be completed within 30 days, and formal consultations within 60 days of submission of an agreed-upon biological assessment. On May 31, 1995, the process was expanded to apply to all consultation efforts in the Pacific Northwest, with the exception that on BLM lands the streamlined consultation process will only apply to consultations involving forest ecosystem activities. During the period from August 30, 1995, to August 30 1996, informal consultations done under this program were completed in an average of 17 days (162 consultations), while formal consultations averaged 46.5 days (50 consultations).

### **(B) Interagency Streamlined Consultation MOA**

An MOA, which is currently being developed jointly by the FWS, NMFS, Bureau of Land Management, and the Forest Service will establish a framework for cooperation in the conductance of section 7 consultation on land management plans, amendments, and programs that BLM and FS implement. The MOA is being developed in response to the need for BLM and FS to update these plans in a timely manner when new species become listed or critical habitat is designated. Early and effective interagency cooperation is critical in meeting this need.

The MOA will confirm that the BLM and FS agree to consult on the effects that implementation of land management plans or other programmatic documents have on listed species or designated critical habitat, to conference on proposed species or proposed critical habitat, and to include an analysis of the effects of the plan on candidate species in a Biological Assessment/ Evaluation. The signatory agencies will agree to maintain and exchange information on species biology and planning schedules and priorities on a regular basis. A document providing guidance on the process for implementing streamlined consultations on land use plans and programs will be finalized and implemented when the MOA is put in place. The MOA will be signed soon. Once signed, the MOA will be considered an addendum to this handbook as Appendix H.

## 5.5 INCREMENTAL STEP CONSULTATIONS

When a statute authorizes an agency to complete an action in incremental steps, the Services shall, at the request of the action agency, issue a biological opinion on the incremental step being considered. That opinion also includes the Services' views on the entire action (50 CFR §402.14(k)). An action agency may proceed with each proposed incremental step after consultation, when:

- o the biological opinion concludes that the incremental step does not violate section 7(a)(2) of the Act;
- o the action agency continues consultation with respect to the entire action, and obtains biological opinions, as required, for each incremental step;
- o the action agency fulfills its continuing obligation to obtain sufficient data upon which to base the final biological opinion on the entire action;
- o the incremental step does not violate section 7(d) of the Act concerning irreversible or irretrievable commitment of resources; and
- o there is a reasonable likelihood that the entire action will not violate section 7(a)(2) of the Act.

Consultation for the first phase of an incremental step action must be conducted formally to address these five factors. If no adverse effect is likely for subsequent intermediate steps, consultation may be conducted informally for such steps. An example of an incremental step consultation can be found in Appendix C.

Incremental step consultation is most appropriate for long-term, multi-staged activities for which agency actions occur in discrete steps, such as the development of oil and gas resources on the Outer Continental Shelf. However, in Conner v. Burford, 848 F.2d 1441 (9th Cir. 1988), cert. denied, 109 S.Ct. 1121 (1989), the Ninth Circuit Court of Appeals disallowed the incremental step consultation approach for onshore oil and gas leasing and made clear the burden it expects action agencies to carry:

*In light of the ESA requirement that the agencies use the best scientific and commercial data available to insure that protected species are not jeopardized, 16 U.S.C. §1536(a)(2), the FWS cannot ignore available biological information or fail to develop projections of oil and gas activities which may indicate potential conflicts between development and the preservation of protected species. We hold that the FWS violated the ESA by failing to use the best information available to prepare comprehensive biological opinions considering all*

*stages of the agency action, and thus failing to adequately assess whether the agency action was likely to jeopardize the continued existence of any threatened or endangered species, as required by section 7(a)(2). To hold otherwise would eviscerate Congress' intent to "give the benefit of the doubt to the species."*

Connor v. Burford  
848 F.2d at 1454 (footnote omitted).

The Services should follow the ruling in Conner on all consultations for proposed on-shore oil and gas leases and other activities on Federal lands located within the following Ninth Circuit States: Alaska, Arizona, California, Hawaii, Idaho, Montana, Nevada, Oregon, and Washington.

The question has been raised about whether this approach is inconsistent with the consultation regulations. The Conner court stated that Service regulations on section 7 consultation limit the incremental step consultation process to activities that are statutorily segmented. See 848 F.2d at 1457 n.38. Under 50 CFR §402.14(k), an opportunity for incremental review exists when an activity is "authorized by a statute that allows the agency to take incremental steps toward the completion of the action." The Department of the Interior believes the incremental steps need not be statutorily-mandated to meet the requirements of section 402.14(k), and has long held that the Mineral Leasing Act allows the use of a segmented decisionmaking process. Therefore, Service regulations do not prevent evaluating on-shore mineral leasing activities through incremental-step consultation. This disparity between Department of the Interior practice and the wording of the Ninth Circuit opinion in Conner does not require a revision to the section 7 regulations. Continued use of the incremental step activities in areas outside the jurisdiction of the Ninth Circuit can still be achieved without regulatory amendment. See Appendix D (SO-7) for a copy of Conner.



## CHAPTER 6 - CONFERENCE

*"Each Federal agency shall confer with the Secretary on any agency action which is likely to jeopardize the continued existence of any species proposed to be listed ... or result in the destruction or adverse modification of critical habitat proposed to be designated for such species. This paragraph does not require a limitation on the commitment of resources as described in subsection (d)."*

Section 7(a)(4) of the Endangered Species Act of 1973

### 6.1 THE NEED FOR CONFERENCE

Section 7(a)(4) was added to the Act to provide a mechanism for identifying and resolving potential conflicts between a proposed action and proposed species or proposed critical habitat at an early planning stage. While consultations are required when the proposed action may affect listed species, a conference is required only when the proposed action is likely to jeopardize the continued existence of a proposed species or destroy or adversely modify proposed critical habitat. However, Federal action agencies may request a conference on any proposed action that may affect proposed species or proposed critical habitat. The Services also can request a conference after reviewing available information suggesting a proposed action is likely to jeopardize proposed species or destroy or adversely modify proposed critical habitat.

### 6.2 INFORMAL CONFERENCE

Conferences may involve informal discussions among the Services, the action agency, and the applicant (if any). During the conference, the Services may assist the action agency in determining effects and may advise the action agency on ways to avoid or minimize adverse effects to proposed species (or candidate species if present, and voluntarily considered by the action agency and/or the applicant), or proposed critical habitat (Figure 6-1). Although not required by the Act, the Services encourage the formation of partnerships to conserve candidate species since these species by definition may warrant future protection under the Act.

#### (A) Conference Report

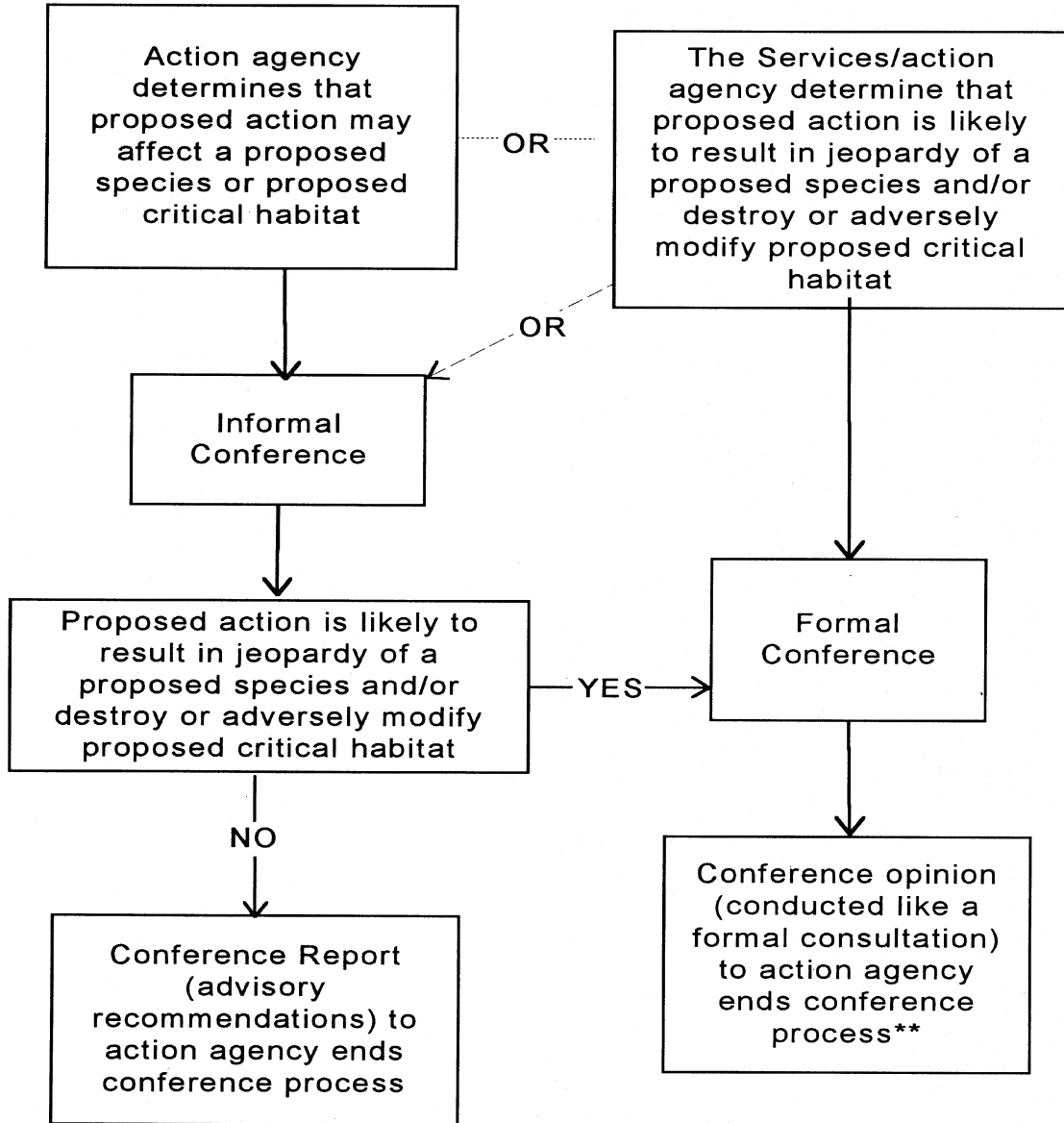
Following informal conference with the action agency, the Services issue a conference report containing recommendations for reducing adverse effects. These recommendations are advisory because the action agency is not prohibited from jeopardizing the continued existence of a proposed species or destroying or adversely modifying proposed critical habitat until the species is listed or critical habitat is designated. However, as soon as a listing becomes effective, the prohibition against **jeopardy** or **adverse modification** applies regardless of the action's stage of

completion. Therefore, action agencies should utilize the conference report's recommendations to avoid likely future conflicts. (Figure 6-2).

**(B) Conference Notice**

If the Services, instead of the Federal Agency, determine that an action is likely to jeopardize a proposed species or destroy or adversely modify proposed critical habitat, it notifies the action agency of a need for conference. This takes the form of a letter or memorandum if the action is likely to jeopardize only a proposed species or adversely modify a proposed critical habitat. When the Services are already in consultation on listed species or designated critical habitats, a conference notice is appended after the incidental take statement.

Figure 6-1. Conference processes.



\* Informal discussions can occur at any time.

\*\* The incidental take statement does not become effective unless the Services adopt the opinion as final once the species is listed and/or critical habitat is designated.

## 6.3 FORMAL CONFERENCE

Action agencies may request formal conference on a proposed action. Although the regulations (50 CFR §402.10(d)) permit the Services to decide whether formal conference is appropriate, generally formal conferences should be provided if requested.

Formal conferences follow the same procedures as formal consultation. The opinion issued at the end of a formal conference is called a conference opinion. It follows the contents and format of a biological opinion. However, the incidental take statement provided with a conference opinion does not take effect until the Services adopt the conference opinion as a biological opinion on the proposed action - after the species is listed.

### (A) Timeframes of Formal Conferences

Section 7 regulations provide no specific schedule for conferences. However, by policy, formal conferences will follow the same timeframes as formal consultations. The timing of a formal conference can be affected by a final listing action. If a proposed species is listed during the conference, and the proposed action still may affect the species, the formal conference ends and formal consultation begins. The subsequent formal consultation timeframes begin with the request from the action agency for initiation of formal consultation.

### (B) Format of Conference Opinion

#### **Stand-alone conference**

A stand-alone conference opinion addresses only proposed species or proposed critical habitat, and has the same format and contents as a final biological opinion (see chapter 4). Standardized language for a stand-alone formal conference opinion includes the following (sample language for formal stand-alone conference can be found in Appendix B):

#### **If no jeopardy/adverse modification:**

**After reviewing the current status of (species), the environmental baseline for the action area [use if different from the range of the species], the effects of the proposed (action) and the cumulative effects, it is the Service's conference opinion that the (action), as proposed, (is/is not) likely to jeopardize the continued existence of the proposed (species), and (is/is not) likely to destroy or adversely modify proposed critical habitat.**

In **jeopardy** or **adverse modification** opinions with a reasonable and prudent alternative, the introductory statement is as follows:

**Based on the foregoing analysis, the Service concurs with the agency that the (proposed action) is likely to (jeopardize the continued existence of the proposed species and/or destroy or adversely modify the proposed critical habitat). While the Act does not preclude an agency from taking an action with such adverse effects on a proposed (species/critical habitat), the (agency) is reminded that if the (species is listed/critical habitat is designated) prior to the completion of the action or while (agency) still maintains any discretionary authority relative to the action, the (agency) may be required to modify or suspend the action at that time pending resolution of formal consultation under section 7. Consequently, the Service advises (the agency) to consider implementing the following reasonable and prudent alternative(s).**

When the conference opinion finds **jeopardy** or **adverse modification** without a reasonable and prudent alternative, the introductory statement is as follows:

**The conference opinion finds the proposed action will result in (likely jeopardy to the species/destruction or adverse modification of critical habitat), and no reasonable and prudent alternative can be identified. Any incidental taking is prohibited by section 9 of the Act.**

In the incidental take statement:

Insert the standard Introductory paragraph of the Incidental Take Statement followed by the paragraph below:

**The prohibitions against taking the species found in section 9 of the Act do not apply until the species is listed. However, the Service advises the (agency) to consider implementing the following reasonable and prudent measures. If this conference opinion is adopted as a biological opinion following a listing or designation, these measures, with their implementing terms and conditions, will be non-discretionary.**

Once the proposed listing or critical habitat proposal is made final, the action agency writes the appropriate Service requesting that the conference opinion be confirmed as a biological opinion.

### **Conference included in a formal consultation**

When both listed and proposed species or designated and proposed critical habitats are affected by a proposed action, the Services advise the action agency of the presence of the proposed species or proposed critical habitat and determine whether the agency wants them considered

during the formal consultation. If the agency does not, the appropriate Service may include a notice of the need to confer in the consultation if there is a likely **jeopardy** to proposed species or **adverse modification** to proposed critical habitat. However, if proposed species or proposed critical habitat are considered in a formal consultation, the analyses for these species/critical habitats are included in the same sections as the listed species, using the standardized statements in 5.2(B)(1). Sample language for a combined formal conference/ consultation can be found in Appendix B.

### **(C) Confirmation of Conference Opinion as a Formal Consultation**

Requests for Service confirmation of a conference opinion must be in writing. The Services must respond within 45 calendar days, and, within that period, may adopt the conference opinion as the biological opinion issued through formal consultation if no significant changes have occurred in the proposed action or the information used in the conference. When the conference opinion is adopted in this manner, it satisfies an action agency's section 7 consultation requirements. If the Services deny the confirmation request, they advise the action agency to initiate formal consultation unless the "may affect" situation has been eliminated.

The standard closing statement for formal conferences is as follows:

**This concludes the conference for (action). You may ask the Service to confirm the conference opinion as a biological opinion issued through formal consultation if the (species is listed or critical habitat is designated). The request must be in writing. If the Service reviews the proposed action and finds that there have been no significant changes in the action as planned or in the information used during the conference, the Service will confirm the conference opinion as the biological opinion on the project and no further section 7 consultation will be necessary.**

**After listing of ((species) as endangered/threatened and/or designation of critical habitat for (species)) and any subsequent adoption of this conference opinion, the Federal agency shall request reinitiation of consultation if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect the species or critical habitat in a manner or to an extent not considered in this conference opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the species or critical habitat that was not considered in this conference opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action.**

**The incidental take statement provided in this conference opinion does not become effective until the species is listed and the conference opinion is adopted as the biological opinion issued through formal consultation. At that time, the project will be**

**reviewed to determine whether any take of the (species/habitat) has occurred. Modifications of the opinion and incidental take statement may be appropriate to reflect that take. No take of the (species/habitat) may occur between the listing of (species) and the adoption of the conference opinion through formal consultation, or the completion of a subsequent formal consultation.**

**Figure 6-2. Comparison of the conference and consultation provisions of the Endangered Species Act and regulations implementing section 7.**

	<b>CONFERENCE</b>	<b>CONSULTATION</b>
<b>Authority</b>	section 7(a)(4)	section 7(a)(2)
<b>When Required</b>	Federal action to fund, authorize or carry out an action likely to jeopardize <u>proposed</u> species or destroy or adversely modify <u>proposed</u> critical habitat	Federal action to fund, authorize or carry out an action which may affect <u>listed</u> species or <u>designated</u> critical habitat.
<b>Types of Procedures</b>	<b>Informal conference -</b> Informal discussions resulting in advisory recommendations on ways to minimize or avoid adverse effects, avoid jeopardy, or adverse modification. If the species is listed or the critical habitat is designated before the action is completed, the need for formal consultation must be determined.	<b>Informal consultation -</b> Informal discussions resulting in advisory recommendations on ways to avoid adverse effects. If adopted, may lead to a concurrence that the action is not likely to adversely affect the listed species/designated critical habitat. ESA obligation is completed, based on concurrence by the Services.



	<b>CONFERENCE</b>	<b>CONSULTATION</b>
	<p><b>Formal conference -</b> At the agency's request, and Service's concurrence, the formal process for consultation will be followed, resulting in an opinion that can stand as the biological opinion for the action if no significant new information or change in the action develops. The incidental take statement is not effective unless the Services adopt the conference opinion once the proposed species is listed.</p>	<p><b>Formal consultation -</b> A formal process with regulated timeframes, that results in the development of a biological opinion and incidental take statement.</p>
<b>Agency Responsi- bilites</b>	<p><b>Formal conference -</b> None, but a prudent agency would adopt any reasonable and prudent alternatives and incidental take terms and conditions if the conference opinion is expected to be adopted as the biological opinion following listing.</p>	<p><b>Formal Consultation -</b> Adopt the reasonable and prudent alternatives and incidental take terms and conditions, or do not undertake the action, or apply for an exemption.</p>

	<b>CONFERENCE</b>	<b>CONSULTATION</b>
<b>Irreversible and Irretrievable Commitment of Resources Precluding Formulation or Implementation of Reasonable and Prudent Alternatives - Section 7(d)</b>	Not applicable, but a prudent agency would not make such a resource commitment if the conference opinion is to be adopted as the biological opinion following listing.	Can not be made between the "may affect" finding and the conclusion of formal consultation.
<b>Incidental Take</b>	<p><b>Informal conference -</b> Not required.</p> <p><b>Formal conference -</b> Required to be addressed in the conference opinion but not effective until adopted by the Services after the species is listed.</p>	<p><b>Informal consultation -</b> Not required.</p> <p><b>Formal consultation -</b> Required except for plant species - anticipated incidental take may be zero.</p>

## CHAPTER 7 - EARLY CONSULTATION

*" ... a Federal agency shall consult with the Secretary on any prospective agency action at the request of, and in cooperation with, the prospective permit or license applicant if the applicant has reason to believe that an endangered species or a threatened species may be present in the area affected by his project and that implementation of such action will likely affect such species."*

Section 7(a)(3) of the Endangered Species Act

### 7.1 ELIGIBILITY FOR EARLY CONSULTATION

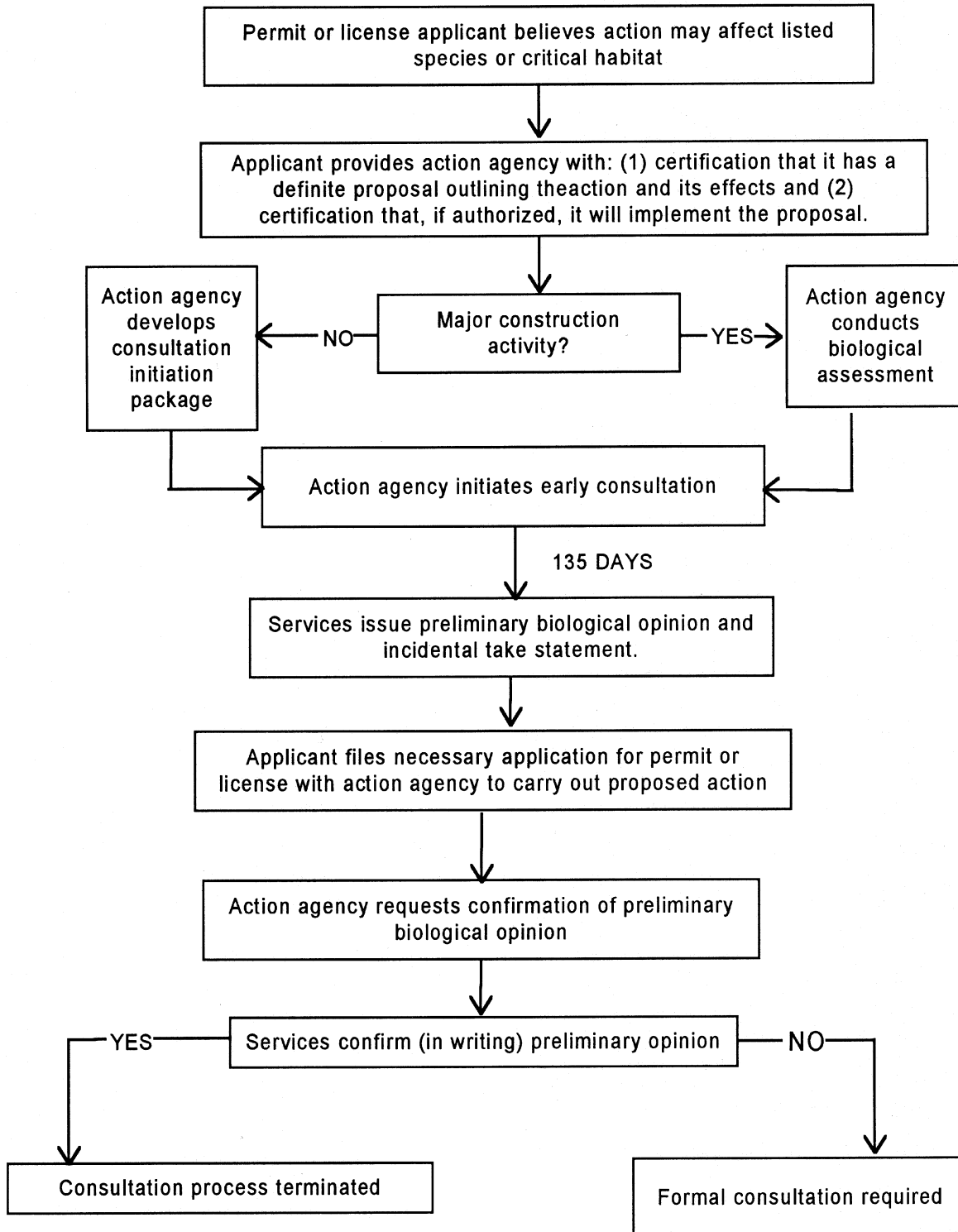
Section 7(a)(3) of the Act was added in the 1982 amendments, and is addressed in section 402.11 of the regulations. Early consultations are intended to reduce the potential for conflicts between listed species or critical habitat and proposed actions. Early consultation is an optional process that occurs before a prospective applicant files an application for a Federal permit or license, frequently referred to as pre-application (Figure 7-1). To qualify, a prospective applicant must certify in writing to the Federal agency that:

- o he/she has a definite proposal outlining the action and its effects; and
- o he/she intends to implement the proposal if it is authorized.

If the prospective applicant provides the action agency with this information in writing, the section 7 regulations require the action agency to initiate early consultation with the Services. This request contains the same information required for formal consultation (50 CFR §402.14(c)). If the action is a major construction activity, a biological assessment is required. Action agencies conducting an early consultation use the same procedures and have the same responsibilities as they do for formal consultations. Although early consultation is conducted between the Services and the action agency, the prospective applicant should be involved throughout the process.

A long "early consultation" example (Shorelands project in San Francisco Bay) is included in Appendix C.

Figure 7-1. Early Consultation Process.



## 7.2 PROCEDURES

***"(2) Consultation under subsection (a)(3) shall be concluded within such period as is agreeable to the Secretary, the Federal agency, and the applicant concerned."***

**Section 7(b)(2) of the Endangered Species Act**

By regulation (50 CFR §402.11(e)) the procedures and timeframes for early consultation are the same as those for formal consultation (Chapter 4). The action agency's request for initiation of early consultation must be accompanied by the information described in 50 CFR §402.14(c). If the prospective activity involves a major construction activity, the action agency must prepare a biological assessment before initiating early consultation.

Preliminary biological opinions prepared for early consultations are nearly identical to biological opinions prepared for formal consultations so they can be confirmed as a final biological opinion once the prospective applicant submits a permit application to the action agency. The major difference between a preliminary biological opinion and a final biological opinion lies in the incidental take statement, which is not effective until the early consultation is confirmed as a formal consultation. A sample of an early consultation document can be found in Appendix B, with modified standardized statements including the following:

Closing of incidental take statement:

**Because the proposed action is likely to result in the taking of listed species incidental to that action, the Service has included an incidental take statement pursuant to section 7(b)(4) of the Act. However, because this is an early consultation on the prospective action, this incidental take statement does not eliminate the (agency's) or the (applicant's) liability under the taking prohibitions of section 9 of the Act.**

**Instead, this statement provides your agency and the applicant with foreknowledge of the terms and conditions that will be required if this prospective application is filed with your agency. These reasonable and prudent measures and implementing terms and conditions become effective only after the Service confirms the preliminary biological opinion as a final biological opinion on the prospective action.**

## 7.3 CONFIRMATION AS A FINAL BIOLOGICAL OPINION

***"(B) Consultation under subsection (a)(3) of this section, and an opinion issued by the Secretary incident to such consultation, regarding an agency action shall be treated respectively as a consultation under subsection (a)(2) of this section, and as an opinion issued after consultation under such subsection, regarding that action if the***

*Secretary reviews the action before it is commenced by the Federal agency and finds, and notifies such agency, that no significant changes have been made with respect to the action and that no significant change has occurred regarding the information used during the initial consultation."*

Section 7(b)(3)(B) of the Endangered Species Act

At the conclusion of an early consultation, the Services issue a preliminary biological opinion that has the same format and contents as a final biological opinion. Once the prospective applicant formally applies for a permit or license from the action agency, and before final action is taken on the application, the action agency writes the Services to request confirmation of the preliminary biological opinion as a final biological opinion. Within 45 days, the Services confirm or deny the preliminary opinion as final if there are no significant changes in the proposed action or the information used in the early consultation. If the Services confirm the preliminary opinion as final, that action satisfies the action agency's section 7 consultation requirements. If the Services deny the request, it asks the action agency to initiate formal consultation. To make the action agency aware of the opportunity to confirm the early consultation, the following closing paragraph is used:

**This concludes early consultation for the (action). You may ask the Service to confirm this preliminary biological opinion as a final biological opinion on the prospective action once you receive the permit application from the prospective applicant. The request must be in writing. If the Service reviews the proposed action and finds that there are no significant changes in the action as planned or in the information used during the early consultation, it will confirm the preliminary biological opinion as a final biological opinion on the project and no further section 7 consultation will be necessary except when one of the following criteria for reinitiation is met: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the action is subsequently modified in a manner that causes an effect on the listed species or critical habitat that was not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. When the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.**

**If the Service does not confirm this preliminary biological opinion as a final biological opinion on the prospective action, the (agency) is required to initiate formal consultation with the Service.**

**Exhibit 7-1. Sample letter to prospective applicants about the availability of early consultation.**

(date)

Dear \_\_\_\_\_:

This responds to your letter of \_\_\_(date)\_\_\_, concerning the upcoming proposed experimental use of \_\_\_\_\_. This agricultural chemical was previously used in [State] under the U.S. Environmental Protection Agency's (EPA) Experimental Use Permit (EUP) \_\_\_-EUP-\_\_ \_.

We have enclosed a general list of all endangered, threatened, and proposed species in [State], organized by county, for planning purposes. When specific test plots have been designated, EPA should consult with this office pursuant to section 7(a)(2) of the Endangered Species Act of 1973, as amended (ESA), prior to the issuance of the EUP for \_\_\_\_\_.

The enclosed list constitutes technical assistance only. It does not fulfill EPA's requirements pursuant to section 7 of the ESA; only EPA or their non-Federal designee can fulfill those requirements. By copy of this letter, EPA's Office of Pesticide Programs is being made aware of their responsibility to consult with the FWS to insure that any action it authorizes, funds, or carries out is not likely to jeopardize the continued existence of listed species or result in destruction or adverse modification of critical habitat. We hope the resulting dialogue between EPA and the FWS will provide registrants and permittees with better guidance on compliance with the Endangered Species Act. If EPA chooses not to consult, the FWS cannot be certain that EPA and you, as the project proponent, have complied with the provisions of the ESA.

Nevertheless, you should be aware that, pursuant to section 7(a)(3) of the ESA, you have certain opportunities as an applicant for a Federal permit or license. Section 7(a)(3) and implementing regulations at 50 C.F.R. §402.11 establish an optional process called "early consultation," that was specifically designed to reduce the likelihood of conflicts between listed species or critical habitat and prospective actions such as yours.

Copies of the specific regulations pertaining to early consultations are enclosed. If you have reason to believe that your proposal, which will eventually be included in an application for Federal agency approval, may affect listed species or critical habitat, you can ask the Federal agency issuing a permit or license (in this case it is EPA) to enter into early consultation with the FWS.

Although early consultation would be between EPA and the FWS, your office must be involved in the process if you elect to request EPA to initiate early consultation with the FWS. Your request for EPA to initiate early consultation with the FWS must be in writing

and must certify that: (1) you have a definitive proposal outlining your action and its effects, and (2) that you intend to carry out your proposal if it is authorized. When EPA receives your proposal, they are required by the ESA to initiate early consultation with the FWS.

If you have questions regarding our comments, please contact \_\_\_\_ (name) \_\_\_\_ of this office at \_\_\_\_ (phone) \_\_\_\_.

Sincerely yours,

Field Supervisor



## CHAPTER 8 - EMERGENCY CONSULTATION

### 8.1 THE NEED FOR EMERGENCY CONSULTATION

Section 7 regulations recognize that an emergency (natural disaster or other calamity) may require expedited consultation (50 CFR §402.05).

Where emergency actions are required that may affect listed species and/or critical habitats, a Federal agency may not have the time for the administrative work required by the consultation regulations under non-emergency conditions. Emergency consultations should be handled with as much understanding of the action agency's critical mission as possible while ensuring that anticipated actions will not violate sections 7(a)(2) or 7(d). Emergency consultation procedures allow action agencies to incorporate endangered species concerns into their actions during the response to an emergency.

An emergency is a situation involving an act of God, disasters, casualties, national defense or security emergencies, etc., and includes response activities that must be taken to prevent imminent loss of human life or property. Predictable events, like those covered in Emergency Use Permits issued by the Environmental Protection Agency for pesticide applications, usually do not qualify as emergencies under the section 7 regulations unless there is a significant unexpected human health risk. Under no circumstances should a Services representative obstruct an emergency response decision made by the action agency where human life is at stake.

### 8.2 PROCEDURES FOR HANDLING EMERGENCY CONSULTATIONS

#### (A) Initial Contact by the Action Agency

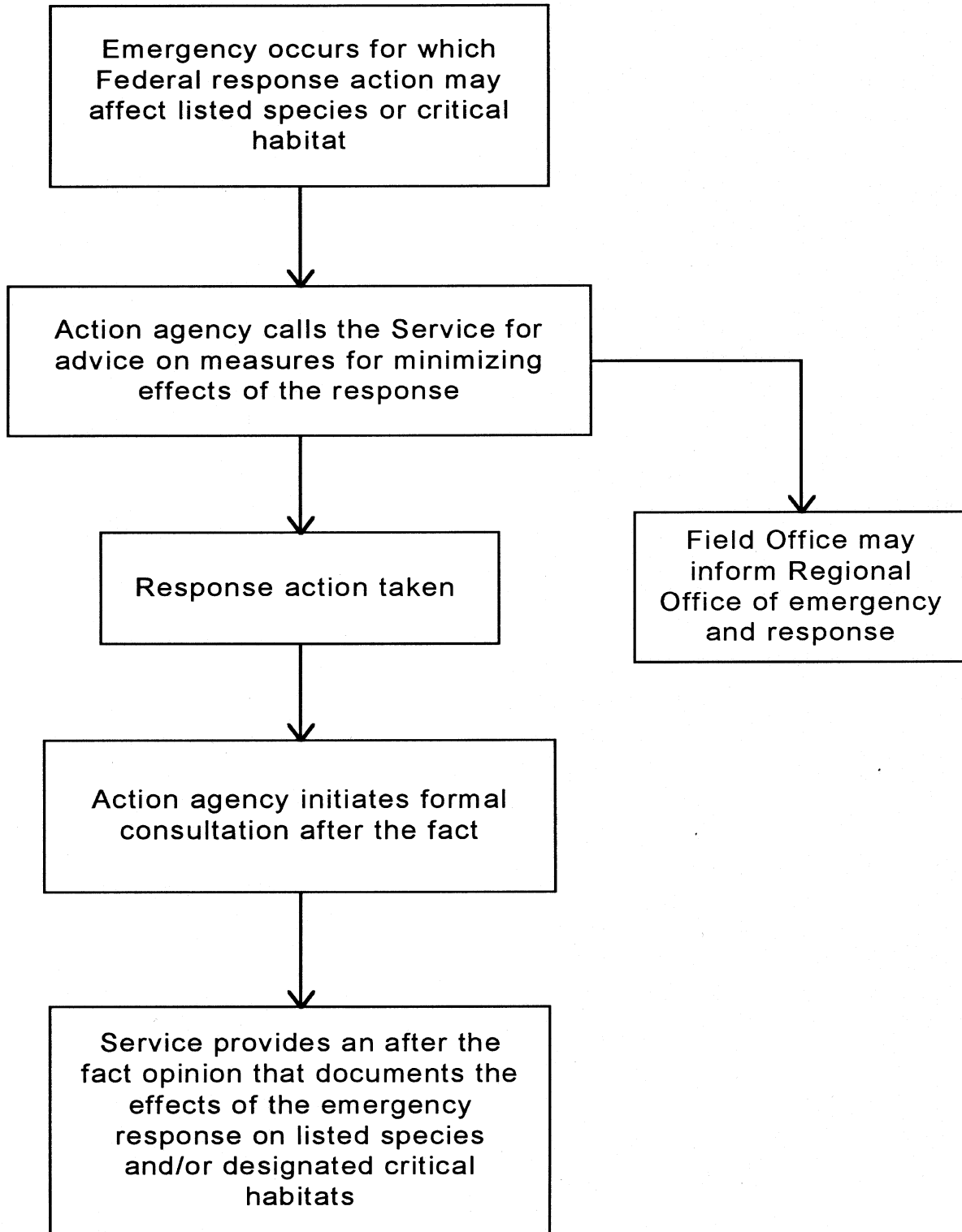
The initial stages of emergency consultations usually are done by telephone or facsimile, followed as soon as possible (within 48 hours if possible) by written correspondence from the Services. This provides the Services with an accurate record of the telephone contact. This record also provides the requesting agency with a formal document reminding them of the commitments made during the initial step in emergency consultation (Figure 8-1). During this initial contact, or soon thereafter, the Services' role is to offer recommendations to minimize the effects of the emergency response action on listed species or their critical habitat (the informal consultation phase). DO NOT stand in the way of the response efforts.

If this initial review indicates the action may result in **jeopardy** or **adverse modification**, and no means of reducing or avoiding this effect are apparent, the agency should be so advised, and the Services' conclusions documented.

Project leaders should establish procedures (e.g., a calling tree) within their offices outlining who can be called to handle the emergency consultation. Once these procedures have been established, they should be provided to all Federal agencies in that operating area responsible for handling emergency situations (e.g., Coast Guard, Environmental Protection Agency, and Federal Emergency Management Agency) and any other Federal agencies with responsibilities in the operating area.

The FWS Field Office conducting the consultation should notify the FWS Assistant Regional Director responsible for endangered species and/or the ecosystem at risk, following timeframes established by FWS Regional guidance. The notification should be in memo form, following the format outlined in Exhibit 8-1. Early telephone notification may be required. For NMFS, the Regional Director should notify the Director, Office of Protected Resources.

**Figure 8-1. Emergency Consultation Process.**



## **(B) Initiating Formal Consultation**

As soon as practicable after the emergency is under control, the action agency initiates formal consultation with the Services if listed species or critical habitat have been adversely affected. Although formal consultation occurs after the response to the emergency, procedurally it is treated like any other formal consultation. However, the action agency has to provide additional information to initiate a formal consultation following an emergency:

- o a description of the emergency;
- o a justification for the expedited consultation; and
- o an evaluation of the response to and the impacts of the emergency on affected species and their habitats, including documentation of how the Services' recommendations were implemented, and the results of implementation in minimizing take.

## **(C) Emergency Biological Opinion**

After concluding formal consultation on an emergency, the Services issue an emergency biological opinion. The "effects of the action" section, documents the recommendations provided by the Services to the action agency and the results of agency implementation of the recommendations on listed species. The timeframe, format and contents are the same as for formal consultation (Chapter 4). A sample of standardized language for an emergency consultation document can be found in Appendix B. The standardized statements for formal consultation have been modified to reflect that this is, in most cases, an after-the-fact consultation.

Documenting **jeopardy** and **adverse modification** biological opinions is particularly important to tracking the effect on species and habitat conditions. For FWS, emergency biological opinions with the conclusion of "not likely to jeopardize" the species or "not likely to result in destruction or **adverse modification** of critical habitat" are completed at the Field Office level. However, if the conclusion is likely **jeopardy** or **adverse modification**, the consultation is elevated to the Regional Office. Such a finding may not have a reasonable and prudent alternative available, unless some further action can restore or enhance the species to a level below the **jeopardy** threshold. For NMFS, emergency opinions are signed in Washington by the Director, Office of Protected Resources, except where a specific Region has been delegated signature authority (i.e., Northwest and Southwest Regions have been delegated signature authority for anadromous fish).

**(D) Incidental Take Statement**

If incidental take is anticipated during the emergency response, the Services can advise the action agency during the informal consultation phase of ways to minimize take. In some circumstances, the actual or estimated take occurring from the agency's emergency response actions can be determined, and should be documented in the biological opinion for future inclusion in the species' environmental baseline. The incidental take statement in an emergency consultation does not include reasonable and prudent measures or terms and conditions to minimize take, unless the agency has an ongoing action related to the emergency. Rather, an emergency consultation incidental take statement documents the recommendations given to minimize take during informal consultation, the success of the agency in carrying out these recommendations, and the ultimate effects on the species of concern through take.

**(E) Conservation Recommendations**

Emergency consultations may contain conservation recommendations to help protect listed species and their habitats in future emergency situations or initiate beneficial actions to conserve the species.

Note: While the timing of "emergencies" is unpredictable, the types of emergencies that may affect listed species or critical habitat can be determined in advance. Emergency response actions are routinely practiced by responsible Federal agencies. Advance coordination with responsible Federal agencies is encouraged so that endangered species components can be incorporated into the emergency response where appropriate.

**Exhibit 8-1. FWS Emergency consultation notification memorandum to the Regional Office (optional).**

(date)

Memorandum

To: Assistant Regional Director, Region \_\_ (number) \_\_

From: Field Supervisor, \_\_\_\_ (name of Field Office) \_\_\_\_

Subject: Emergency Consultation on \_\_\_\_ (name of Federal action) \_\_\_\_.

This office has completed an informal emergency consultation. The following information summarizes the location of the emergency, nature of the emergency, listed species and critical habitat(s) involved, and how those species and habitats are likely to be affected by the emergency.

Date of Contact:                      Time:

Contact(s) Name:

Agency:

Contact(s) Title:

Nature of the Emergency:

Species/Critical Habitats in the Area:

Anticipated Effects:

Recommendations Given the Contact:

## **CHAPTER 9 - MONITORING AND REPORTING**

### **9.1 MONITORING IMPLEMENTATION/EFFECTS OF REASONABLE AND PRUDENT ALTERNATIVES AND MEASURES**

When incidental take is anticipated, the terms and conditions must include provisions for monitoring project activities to determine the actual project effects on listed fish or wildlife species (50 CFR §402.14(i)(3)). Project monitoring, carried out by the Federal agency or applicant, provides the Services with information essential to assessing the effects of various actions on listed species and designated critical habitat. Monitoring allows the Services to track incidental take levels and to refine biological opinions, reasonable and prudent alternatives, reasonable and prudent measures, and terms and conditions. Consequently, monitoring programs should be integral elements of all interagency consultations concluding that an action may adversely affect listed species or critical habitat.

Monitoring programs resulting from interagency consultations should be designed to: (1) detect adverse effects resulting from a proposed action, (2) assess the actual level of incidental take in comparison with the anticipated incidental take level documented in the Biological Opinion, (3) detect when the level of anticipated incidental take is exceeded, and (4) determine the effectiveness of reasonable and prudent measures and their implementing terms and conditions. The following objectives/steps should be taken to develop monitoring programs:

- o Develop objectives. Any monitoring program associated with section 7 consultations should answer specific questions or lead to specific conclusions, captured in the objectives. If the objectives are well-developed, they will help shape a complete monitoring program.
- o Describe the subject of the monitoring program: Effects on populations of a listed species, effects on the habitat (critical or not) of a listed species, or effects on both.
- o Describe the variables to be measured and how data will be collected. The success or failure of monitoring programs ultimately depends on the information collected about the variables that demonstrate or refute a position outlined in the objectives. Collection methods should be standardized to ensure comparability with data from studies in other areas.
- o Detail the frequency, timing, and duration of sampling for the variables. Determining how frequently and how long to collect data is important to the success or failure of the program. If the interval between samples is too long or if the sampling program is too short, the monitoring program may not detect an effect. The frequency, timing, and duration of the sampling regimen should relate

to the type of action being evaluated, the organism affected by the action, and the response of the organism to the effects produced by the action.

- o Describe how the data are to be analyzed and who will conduct the analyses. A monitoring program is more effective when the analytical methods are integrated into the design. For example, parametric and non-parametric statistical analyses require different sample sizes, which will affect the frequency, timing, and duration of sampling.
- o Discuss the relationship between the monitoring program being included in a consultation and other monitoring programs. At almost any given time, hundreds of environmental monitoring programs are being conducted in every region of the country. Whenever possible, these should be coordinated to eliminate duplication, standardize sampling methods, and/or improve geographic coverage.

## **9.2 TRACKING COLLECTIVE EFFECTS ON SPECIES AND THEIR HABITATS**

Managing collected information efficiently improves the overall effectiveness of interagency consultations and makes it easier to (1) evaluate the effects of various actions as they accumulate over time, (2) determine which consultations need to be reinitiated when a new species is listed, (3) determine when the level of incidental take approaches the likely **jeopardy/adverse modification** thresholds, (4) exchange similar information across Regional boundaries, and (5) determine if reasonable and prudent alternatives and measures are carried out.

### **(A) FWS**

For FWS, the following set of fields and values will form the core of a FWS nationwide information system on interagency consultation. The fields and values will become part of a national, computerized information system, which will be developed by a team of WO and Regional biologists. Data are to be maintained for all formal consultations, conferences, early consultations, emergency consultations, and concurrence letters that conclude informal consultations (data on the latter should be kept in case consultations are required because a new species is proposed or listed, or critical habitat is proposed or designated).

To facilitate data exchange within the FWS, the national database will be maintained and updated by the Regional Offices and will be posted by the WO on the Threatened and Endangered Species System (TESS) or on an intra-net page available for read-only access. Until this national database becomes operational, each Region should maintain their own database.



Field Name	Field Values
Species Name	For vertebrates, butterflies, and mussels, use the common name in the format used in the official list (50 CFR §17). For all other species (primarily invertebrates and plants) use the scientific name. Enter only one name for each record.
Log Number	Enter the log number for the consultation. Use the following format:  RN-FO-YY-T-XXXX (RX)  RN = Region number FO = two-number or letter code for the field office YY = last two digits of the fiscal year T = type of consultation F = formal I = informal C = conference E = early M = emergency P = programmatic XXXX = a sequential number 0001-9999  Reinitiated consultations use the log number of the original consultation with the letter (R) added at the end. If there are several reinitiations for the same consultation, the suffix reads as (R1) to (RX) for each new reinitiation.
Record Number	Numerical sequence of the record.
Fiscal Year	Fiscal year of initiation.
Region	Lead Region for consultation.
Office	FWS office that issued the document. Use a four letter code for field offices; or ROn (where n is the Region number) for consultations conducted by a Region.
Action Agency	Standard abbreviation for action agencies where applicable (e.g., EPA, BLM, COE).
Department	Standard abbreviation for the department (e.g., DOI).

Applicant	[Pursuant to the Privacy Act, do not maintain the applicant's name in this file if the applicant is an individual.]
Action Name	Short name of the proposed action (e.g., Didion bulk transfer facility; Page Avenue extension).
Permit Number	Permit number used by action agency where one exists.
Description	Short description of the proposed action. For example, bulk transfer facility, airport construction, landfill expansion, etc.
Ecoregion	Identify the ecoregion number and name. Provide a short description of species habitat.
State	Standard two letter code for State or Territory in which proposed action will occur.
County	County name or code if multiple counties.
Locality	Township, city, or land management area (for example, Shawnee National Forest, Indiana Dunes National Lakeshore) in which action will occur.
Start Date	For consultations and formal conferences, enter the date initiated.
Date Issued	Date the document or concurrence letter was issued.
Species Conclusion	Two letter code for the conclusion of the consultation for listed species:  NE = No effect NL = Not likely to adversely affect LA = Likely to adversely affect NJ = Not likely to jeopardize J = Likely to jeopardize
Habitat Conclusion	Conclusion of consultation for critical habitat  AM = Destruction or adverse modification NM = No destruction or adverse modification
RPAs	Summary of reasonable and prudent alternatives for <b>jeopardy</b> or <b>adverse modification</b> biological opinions.

Take Type	Type and quantity/extent of incidental take anticipated, numbers of individuals by species name and/or acreages of habitat type.
Take Level	Level of take being anticipated (with reasonable and prudent alternatives implemented) and time period covered.
RPMs	Summary of reasonable and prudent measures for incidental take.
Terms	Enter summary of terms and conditions of incidental take.
Report	Report required (Yes or No).
Report Frequency	How frequently must the action agency report?
Report Due	Date report is due to the FWS.
Conservation Recommendations	Summary of conservation recommendations.
Follow-up	Summary of any follow-up evaluation.
Contact	Name and telephone number of the individual who authored the consultation.
Notes	Notes on the consultation.

**(B) NMFS**

NMFS' Protected Species Status and Tracking System (PSST) is designed to provide rapid and accurate access to information for protected species and includes information about section 7 consultations, recovery plans and listing actions.

The part on section 7 consultation contains information on formal and informal consultations. Data is maintained for the action, impact, reasonable and prudent alternatives and measures, and conservation recommendations. Regions provide copies of all opinions to the Office of Protected Resources where the data system is maintained.

## SUGGESTED READING

### Endangered & Threatened Species Conservation

- Bean, M.J. 1983. *The Evolution of National Wildlife Law*. Praeger Publ.; New York, New York. 449 pp.
- Clark, T.W., R.P. Reading, and A.L. Clarke (eds.) 1994. *Endangered Species Recovery - Finding the Lessons, Improving the Process*. Island Press; Washington, D.C. 450 pp.
- Gilpin, M.E. and M.E. Soule. 1986. Minimum viable populations: processes of species extinction. pp. 18-34. In: M.E. Soule (ed.) *Conservation biology: the science of scarcity and diversity*. Sinauer Associates, Inc.; Sunderland, Massachusetts.
- Goodman, D. 1987a. The demography of chance extinction. pp. 11-19. In: M.E. Soule (ed.) *Conservation biology: the science of scarcity and diversity*. Sinauer Associates, Inc.; Sunderland, Massachusetts.
- Goodman, D. 1987b. How do any species persist? Lessons for conservation biology. *Conservation Biology* 1:59-62.
- Harrison, G.W. 1979. Stability under environmental stress: resistance, resilience, persistence, and variability. *American Naturalist* 113:659-669.
- Innis, G. 1974. Stability, sensitivity, resilience, persistence. What is of interest? pp.131-139. In: S. Levin (ed.) *Ecosystem analysis and prediction*. SIAM; Philadelphia, Pennsylvania.
- Littel, R. 1992. *Endangered and Other Protected Species: Federal Law and Regulations*. Bureau of Indian Affairs, Inc.; Washington, D.C. 185 pp.
- National Research Council. 1995. *Science and the Endangered Species Act*. National Academy Press; Washington, D.C. 271 pp.
- Pimm, S.L. 1991. *The balance of nature: ecological issues in the conservation of species and communities*. University of Chicago Press; Chicago, Illinois.
- Schaffer, M. 1987. Minimum viable populations: coping with uncertainty. pp. 69-86. In: M.E. Soule (ed.) *Conservation biology: the science of scarcity and diversity*. Sinauer Associates, Inc.; Sunderland, Massachusetts.

Trudghill, S.T. 1988. Soil and vegetation systems. Second edition. Oxford University Press; New York, New York.

Underwood, A.J. 1989. The analysis of stress in natural populations. *Biological Journal of the Linnean Society* 37:51-78.

Vaughan, R. 1994. Endangered Species Act Handbook. Government Institutes, Inc. Rockville, MD. 165 pp.