

MEMORANDUM

July 22, 1998

SUBJECT: Screening potential reservoir sites for environmental impacts

FROM: Carolyn Yale, U.S. Environmental Protection Agency
Bob Pine, U.S. Fish and Wildlife Service
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Jim Monroe, U.S. Army Corps of Engineers

TO: Mark Cowin, CALFED

Recently the CALFED Program has reintroduced the question whether, prior to completion of Program Phase II, potential reservoir sites should be screened based on environmental impacts. We support conducting environmental screening during Phase II. We believe that environmental screening is needed at this time to exclude from the list of most promising candidates any sites with known major-- perhaps unmitigable-- environmental resource conflicts. In this respect, the screening would go beyond simply "flagging" sites with potential environmental conflicts, such as listed species. Also, to the extent information is available, the environmental screening could improve assessment of the overall feasibility of sites under consideration by identifying sites which might have substantially higher environmental costs screening. This could take CALFED beyond the "representative" environmental compliance costs currently applied to the sites being evaluated for practicability on the basis of engineering and economic factors. Generally, until thorough environmental documentation and evaluation are completed, we must be very clear that the environmental cost factor is a placeholder only. (Please note that the environmental screening approach we suggest here could be applied to facilities other than surface reservoirs.)

We recognize that there is a concern that thorough and up-to-date environmental information is not available for all candidate sites. In a situation with incomplete resource information for Phase II, CALFED cannot warrant that all sites under consideration would be environmentally acceptable; nor can it rank all sites by environmental criteria. However, a Phase II screening can use available information to identify sites where there could be significant impacts which (a) would make mitigation and permitting questionable, or (b) would likely require mitigation substantially above the standard cost. Sites known to be very problematic (mitigation and permitting questionable) could be excluded the promising candidates list.

During Phase II CALFED should also establish the framework for more detailed environmental review of candidate sites which could proceed into Stage 1. This framework would be an expanded, more detailed version of the Phase II screening, designed to include the full range of direct and indirect impacts which should be considered on a site specific basis.

We have provided a number of attachments with this memorandum. Attachments 1 - 3 relate to screening to assess environmental compliance under Clean Water Act Section 404 and the federal Endangered Species Act. The focus here is on criteria which refer to a threshold evaluation of whether a project would be permissible under CWA Section 404 or would not jeopardize the continued existence of listed species. Attachment 4 (pages taken from a longer Department of Fish and Game document) summarizes an approach to arraying and valuing environmental factors which could be useful in assessing environmental risks at various sites. A final screening list (Attachment 5) introduces resource categories which would be included in environmental reviews under other laws, such as NEPA and CEQA. As with ESA and CWA 404, mitigation of significant impacts to the resources called out in Attachments 4 and 5 could affect project design and cost. The list in Attachment 5, particularly, is preliminary only.

The kinds of environmental resources, criteria for significance of impacts to these resources, mitigation procedures and requirements, and circumstances (if any) when an impact may be considered unmitigable differ under ESA, CWA 404, and other programs. The attachments identify some of this information generally, but substantially more detail would be needed to conduct the screening.

In closing, we recommend the following CALFED activities:

- I) Set up a Phase II environmental review to screen for significant "threshold" permit and compliance issues. Use ESA and CWA 404 screens for threshold issues.
- ii) Set up a review using ESA, CWA 404 and "other environmental factors," focusing on information which will help estimate if there could be "costs" appreciably exceeding a norm. Use of environmental information to identify sites with likely high costs could reduce uncertainties carried forward into Phase III and might be especially useful in comparing sites which are the current focus of more detailed "prefeasibility" study.

We look forward to discussing this screening proposal, and appropriate schedule and levels of detail, with the other CALFED agencies and Program staff.

cc: Sergio Guillen, CALFED

attachments:

1. Clean Water Act Section 404: significant degradation
2. Application of CWA Section 404(b)(1) guidelines in environmental screening
3. Endangered Species Act:
 - Enclosure A: Endangered Species Act review for the CWA Section 404(b)(1) guidelines
 - Enclosure B: Endangered Species Act coverage in environmental documents
4. Environmental scoring methodology and data
5. Other environmental screening factors

Attachment 1
Environmental Screening: Clean Water Act Section 404

Significant Degradation

Any project which requires discharges of dredged or fill material to waters of the United States requires authorization under section 404 of the Clean Water Act.¹ Unless a project's impacts are so minor that they can be authorized under a nationwide permit, any such permit authorization must be consistent with EPA's 404(b)(1) Guidelines. To comply with the 404(b)(1) Guidelines, a project proponent must satisfy a number of requirements.² One of these requirements is specifically designed to set a threshold of minimal environmental acceptability for a project:

...no discharge of dredged or fill material shall be permitted which will cause or contribute to significant degradation of the waters of the United States. 40 CFR § 230.10c

EPA's 404(b)(1) Guidelines include detailed criteria for assessing whether a particular project will cause or contribute to significant degradation of the waters of the United States. Any surface water storage facility proposed by CALFED is likely to require a section 404 permit, and thus must be assessed against these criteria to determine whether it will comply with this requirement. Since a project that causes significant degradation cannot be permitted under section 404, it is appropriate to use the significant degradation criteria to screen sites for water storage facilities.

¹ Any surface water storage facility proposed by CALFED is likely to require a section 404 permit, and thus must be assessed against these criteria to determine whether it will comply with this requirement.

² The 404(b)(1) Guidelines contain a number of additional relevant requirements. Some of these can be assessed in the context of evaluating whether a proposed project causes or contributes to significant degradation. These include compliance with state water quality standards (40 CFR 230.10(b)(1)) and impacts to threatened and endangered species (40 CFR 230.10(b)(3)). One key component of the 404(b)(1) Guidelines is determining the least environmentally damaging practicable alternative (40 CFR 230.10(a)). While projects must comply with this requirement, it is difficult to assess this with confidence at the initial screening stage. This requirement can be best employed as a means for selection among the alternatives that survive initial screening to determine which of the practicable sites is/are the least environmentally damaging.

Significant Degradation Criteria

The four specific areas which must be assessed in determining whether a project causes or contributes to significant degradation are:

- potential impacts on the physical and chemical characteristics of the aquatic ecosystem;
- potential impacts on biological characteristics of the aquatic ecosystem;
- potential impacts on special aquatic sites;
- potential effects on human use characteristics. 40 CFR 230 Subparts C-F.

With regard to potential impacts to physical and chemical characteristics, it is necessary to consider potential impacts to: substrate (40 CFR § 230.20), turbidity (40 CFR § 230.21), water quality-including temperature (40 CFR § 230.22), water circulation (40 CFR § 230.23), normal water fluctuations (40 CFR § 230.24), and salinity gradients (40 CFR § 230.25).

With regard to potential impacts to biological characteristics, it is necessary to consider potential impacts to: threatened and endangered species (40 CFR § 230.30), aquatic organisms in the food web (40 CFR 230.31), and other wildlife (40 CFR § 230.32).

With regard to potential impacts to special aquatic sites, it is necessary to consider potential impacts to: sanctuaries and refuges (40 CFR § 230.40), wetlands (40 CFR § 230.41), mud flats (40 CFR § 230.42), vegetated shallows (40 CFR § 230.43), coral reefs (40 CFR § 230.44), and riffle and pool complexes (40 CFR § 230.45).

With regard to potential effects on human use, it is necessary to consider potential impacts to: municipal and private water supplies (40 CFR § 230.50), recreational and commercial fisheries (40 CFR § 230.51), water-related recreation (40 CFR § 230.52), aesthetics (40 CFR § 230.53), and parks and other preserves (40 CFR § 230.54).

The 404(b)(1) Guidelines provide four illustrations of effects that can be considered as contributing to significant degradation. The Guidelines then require consideration of impacts in four specific areas in determining whether a particular project causes or contributes to significant degradation.

The four illustrations of effects that can be considered as contributing to significant degradation are:

- (1) Significantly adverse effects of the discharge of pollutants on human health or welfare, including but not limited to effects on municipal water supplies, plankton, fish, shellfish, wildlife, and special aquatic sites.
- (2) Significantly adverse effects of the discharge of pollutants on life stages of aquatic life and other wildlife dependent on aquatic ecosystems, including the transfer, concentration,

and spread of pollutants or their byproducts outside of the disposal site through biological, physical, and chemical processes.

(3) Significantly adverse effects of the discharge of pollutants on aquatic ecosystem diversity, productivity, and stability. Such effects may include, but are not limited to, loss of fish and wildlife habitat or loss of the capacity of a wetland to assimilate nutrients, purify water, or reduce wave energy; or

(4) Significantly adverse effects of the discharges of pollutants on recreational, aesthetic, and economic values.

40 CFR § 230.10(c)(1-4)

Example:

To illustrate the application of these criteria, it is useful to discuss an example of the significant degradation analysis. One major environmental impact of constructing an on-stream surface water reservoir is to the area inundated by the reservoir. Whether these impacts constitute significant degradation will depend on the nature and magnitude of the impacts and the extent to which they can be mitigated.

Nature and magnitude (significance) of impacts

One example of an relevant environmental impact from establishing a reservoir site can be the loss of white water rafting resources. This is an impact to water-related recreation, which must be considered as a potential effect to human use from siting a reservoir. 40 CFR § 230.52. After establishing that this impact will occur, it is necessary to determine whether this impact constitutes a significant adverse effect on recreational values. To make this determination, it is relevant to consider the extent of demand of this white water rafting resource (both current and projected future use), and the availability of other areas where this demand could be satisfied. It is also relevant to consider any unique features of the area that could not be satisfied by other sites.

Mitigation

In determining whether a project complies with the significant degradation requirement, it is appropriate to consider whether there are appropriate and practicable discharge conditions which can be included to minimize adverse effects. 40 CFR § 230.12(a)(2) These can include compensatory mitigation requirements, or operational conditions to minimize adverse effects. Thus, after documenting the extent of impact to white water rafting uses through inundating a particular site, it is then relevant to consider whether this loss of recreational use can be mitigated. Under EPA and Corps of Engineers policy, mitigation follows a sequence of first considering how to avoid an impact, then examining options for minimizing unavoidable

impacts, then providing compensation for impacts remaining after avoidance and minimization have been attempted. Memorandum of Agreement Between the Environmental Protection Agency and the Department of the Army Concerning the Determination of Mitigation Under the Clean Water Act Section 404(b)(1) Guidelines, (February 6, 1990) at pp. 2-3.

If a reservoir site would inundate white water rafting areas, avoidance of impacts is probably impossible without abandoning the site. Minimization of impacts may be possible, and should be examined. Minimization would probably require operational restrictions on storage to reduce, to the extent practicable, the areas inundated, thus reducing impacts to the recreational use. However, depending on the reservoir site and the location of the recreational areas, there may be substantial impacts remaining, even after considering all practicable minimization options.

The final mitigation option is compensatory mitigation. It would be necessary to consider to what extent (if at all) the lost white water rafting resource could be satisfactorily replaced through creating, restoring or enhancing white water resources elsewhere. This would constitute in-kind mitigation, which (as a general matter) is the preferred approach to compensatory mitigation. A basic problem to consider in this analysis is whether it is possible to create, restore or enhance white water rafting resources. It may not be possible. Another critical issue would be whether mitigating for this loss of recreation use elsewhere would satisfactorily address the recreational needs of the people who relied on the site in question. The mitigation site may be too distant to adequately compensate for the lost resource, or there may be unique features of the lost site that are irreplaceable.

A final issue with regard to compensatory mitigation is whether out-of-kind mitigation could serve to compensate for the lost white water rafting resource (assuming satisfactory in-kind mitigation is not available). It is appropriate to evaluate whether other forms of recreation can be created as part of the reservoir project (e.g. boating on the reservoir), and whether they could be considered as compensation for the lost recreational use. This would be a highly controversial form of mitigation for the lost use, since the people who rely on white water rafting for recreation would not likely consider slack water boating an adequate compensatory resource.

In summary, it is necessary to evaluate the significance of the white water rafting use that would be lost through using a particular reservoir site. Then it is necessary to evaluate the extent to which this loss can be mitigated through avoidance, minimization of impacts and compensatory mitigation.

Threshold for permissibility

If after all practicable mitigation, there will still be "[s]ignificantly adverse effects ... on recreational values," it is appropriate to determine that the reservoir site is unpermissible under section 404 of the Clean Water Act.

Attachment 5

Other Environmental Screening Factors: (partial list of information to be used in developing more complete estimate of compliance requirements, and difficulty and costs of compliance)

Air Quality

Purpose of this screen: To evaluate air quality impacts to unique, nationally significant areas such as wilderness areas, national parks, roadless areas, and scenic and wild rivers.

The Clean Air Act provides for the review of any source which may affect Class 1 areas [40 CFR 52.21(p) Prevention of Significant Deterioration Regulations][National Park Class 1 areas in California include Kings Canyon, Lassen Volcanic, Redwood, Sequoia, and Yosemite National Parks; Joshua Tree, Lava Beds, and Pinnacles National Monuments; and Point Reyes National Seashore. Although the focus is on stationary air sources, mobile sources can be included as part of the source. Class 1 areas include national wilderness areas, national parks, international parks and national memorial parks. Part of the review includes consideration of air quality related values such as water, flora and fauna, visibility and odor. A visibility impact analysis is also required for new sources or major modifications that have the potential for an adverse impact on visibility in any Class 1 area or integral vista.

It is conceivable that a proposed reservoir could affect the integral vista of a Class 1 area or its air quality related values. In addition, potential induced growth and increased recreational use triggered by a reservoir may result in increased air quality and visibility impacts to a Class 1 area. For instance, Joshua Tree National Monument is already suffering from adverse air quality generated in the Los Angeles Basin.

Other Air Quality criteria:

Federal agencies are also required by the Clean Air Act to assure that actions conform to an approved air quality implementation plan. If the project area is in a nonattainment area, the Federal agencies may need to demonstrate compliance with conformity requirements of the Clean Air Act [Section 176(c)]. General Conformity Regulations can be found in 40 CFR Parts 51 and 93 (58 Federal Register, page 63214, November 30, 1993). These regulations should be examined for applicability to the proposed actions. These regulations may come into play especially if the project site is nonattainment for particulate matter, carbon monoxide, and ozone/NOx; since construction of a large reservoir may result in, at least temporary, violations of these air quality standards.

Safe Drinking Water

Purpose of this screen: To protect drinking water sources and their watersheds.

It is important that CALFED policies, plans and decisions identify and protect community drinking water sources per the requirements of the Safe Drinking Water Act (SDWA). This is especially true for communities that rely on surface water for drinking water and where their source waters are in watersheds that may be influenced by proposed reservoirs. For instance, it is conceivable that a proposed reservoir could directly or indirectly or change restrict flows to an existing drinking water source (e.g., influence surface and groundwater hydrology and flows). A key provision of the 1996 SDWA calls for States and local communities to delineate, assess and protect drinking water sources. States are currently developing their Source Water Protection Programs and are to have delineation and assessment of all community water systems by 2002.

Other Potential Screens

Loss of national or state significant agriculture land. For example, cumulative loss of Williamson Act agricultural lands due to land use conversion to reservoirs.

Presence of hazardous waste or superfund sites, e.g. landfills, current and historical hazardous waste storage sites, soils with high asbestos or selenium. One could also consider the potential for the future reservoir site to be adversely affected by nearby hazardous waste storage sites or toxic spills.

Cultural resources. Compliance with Section 106 of the National Historic Preservation Act and (for federal property) Native American Graves Protection Act.

ENCLOSURE A

Endangered Species. This attachment identifies those listed, proposed, and/or candidate species that may occur in the proposed project area. Information and maps concerning candidate species in California may be obtained from the California Natural Diversity Data Base, a program administered by the California Department of Fish and Game. Requests for information should be addressed to the Marketing Manager, California Department of Fish and Game, Natural Diversity Data Base, 1416 Ninth Street, Sacramento, California 95814. The marketing manager may be contacted by calling (916) 324-0562. You may request additional information from the Chief, California Department of Fish and Game, Non-Game Heritage Program, at (916) 324-8348.

Listed species are fully protected under the mandates of the Endangered Species Act (Act), as amended. Section 9 of the Act and its implementing regulations prohibit the "take" of a federally listed fish and wildlife species by any person, as defined by the Act. Take is defined by the Act "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect" any such species. Take may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or shelter (50 CFR § 17.3).

Take incidental to an otherwise lawful activity may be authorized by one of two procedures. If a Federal agency is involved with the permitting, funding, or carrying out of this project, initiation of formal consultation is required between that agency and the Service pursuant to section 7 of the Act if it is determined that the proposed project may affect a federally listed species. Federal agencies must confer if they determine that the continued existence of a proposed species may be jeopardized by the project. Such consultation or conference could result in a biological opinion that addresses anticipated effects of the project to listed and proposed species. The biological opinion may authorize a limited level of incidental take for federally listed species.

If a Federal agency is not involved with the project, and federally listed species may be taken as part of the project, then an "incidental take" permit pursuant to section 10(a) of the Act should be obtained. The Service may issue such a permit upon completion by the permit applicant of a satisfactory conservation plan for the listed species that may be affected by the project.

We recommend that appropriately designed surveys for listed, proposed, or candidate species be undertaken by qualified biologists. Surveys for plants should not be restricted to the identified species; instead, a complete botanical inventory of the project site should be conducted. Botanical surveys should be conducted at intervals throughout the spring and summer, in order to maximize the likelihood of encountering each species during the season most appropriate for accurate identification. Surveys should be based on field inspection, and not on prediction of occurrence based on habitat or physical features of the site. Guidelines for conducting adequate botanical surveys are available from the Natural Heritage Division of the California Department of Fish and Game at (916) 322-2493.

The results of all biological surveys should be published in the environmental impact report. The report should include a brief discussion of survey methods (including sampling methods and timing of surveys), results (including a list of all species encountered as well as maps of vegetation types, populations of plant species, and breeding, nesting or burrowing sites or other habitat components important to animal species), and conclusions. If it is concluded that a given sensitive species is not present, the justification for this conclusion should be fully explained.

Should these surveys determine that listed, proposed, or candidate species may be affected by the proposed project, the Service recommends that the project proponent, in consultation with this office and the California Department of Fish and Game, develop a plan that mitigates for the project's direct and indirect impacts to these species and compensates for project-related loss of habitat. The mitigation plan also should be included in the environmental impact report.

One of the benefits of considering candidate species as well as listed and proposed species early in the planning process is that by exploring alternatives, it may be possible to avoid conflicts that could develop, should a candidate species become listed before the project is complete. In addition, in instances where the Service addresses proposed projects under its Fish and Wildlife Coordination Act authority, we must also analyze the impacts on candidate species and make recommendations to mitigate any adverse effects.

ENCLOSURE B

The goal of the U.S. Fish and Wildlife Service is to conserve, protect and enhance fish, wildlife, and their habitats by timely and effective provision of fish and wildlife information and recommendations. To assist us in accomplishing this goal, we would like to see the items described below discussed in your environmental documents for the proposed project.

Project Description. The document should very clearly state the purposes of, and document the needs for, the proposed project so that the capabilities of the various alternatives to meet the purposes and needs can be readily determined.

A thorough description of all permanent and temporary facilities to be constructed and work to be done as a part of the project should be included. The document should identify any new access roads, equipment staging areas, and gravel processing facilities which are needed. Figures accurately depicting proposed project features in relation to natural features (such as streams, wetlands, riparian areas, and other habitat types) in the project area should be included.

Affected Environment. The document should show the location of, and describe, all vegetative cover types in the areas potentially affected by all project alternatives and associated activities. Tables with acreages of each cover type with and without the project for each alternative would also be appropriate. We recommend that all wetlands in the project area be delineated and described according to the classification system found in the Service's Classification of Wetlands and Deepwater Habitats of the United States (Cowardin 1979). The Service's National Wetland Inventory maps would be one starting point for this effort.

The document should present and analyze a full range of alternatives to the proposed project. At least one alternative should be designed to avoid all impacts to wetlands, including riparian areas. Similarly, within each alternative, measures to minimize or avoid impacts to wetlands should be included.

Lists of fish and wildlife species expected to occur in the project area should be in the document. The lists should also indicate for each species whether or not it is a resident or migrant, and the period(s) of the year it would be expected in the project area.

Environmental Consequences. The sections on impacts to fish and wildlife should discuss impacts from vegetation removal (both permanent and temporary), filling or degradation of wetlands, interruption of wildlife migration corridors, and disturbance from trucks and other machinery during construction and/or operation. These sections should also analyze possible impacts to streams from construction of outfall structures, pipeline crossings, and filling. Impacts on water quality, including nutrient loading, sedimentation, toxics, biological oxygen demand, and temperature in receiving waters should also be discussed in detail along with the resultant effects on fish and aquatic invertebrates. Discussion of indirect impacts to fish, wildlife, and their habitats, including impacts from growth induced by the proposed project,

should also be addressed in the document. The impacts of each alternative should be discussed in sufficient detail to allow comparison between the alternatives.

The cumulative impacts of the project, when viewed in conjunction with other past, existing, and foreseeable projects, need to be addressed. Cumulative impacts to fish, wildlife, wetlands and other habitats, and water quality should be included.

Mitigation Planning. Under provisions of the Fish and Wildlife Coordination Act, the Service advises the U.S. Army Corps of Engineers on projects involving dredge and fill activities in "waters of the United States", of which wetlands and some riparian habitats are subcategories. Since portions of this proposal may ultimately require a Corps permit, the Service will subsequently be involved under the Coordination Act. Therefore, if you have not done so already, we suggest that you or your representative consult the Corps regarding onsite wetlands and related habitats that may fall under their jurisdiction, and include this information in the draft document. When reviewing Corps public notices, the Service generally does not object to projects meeting the following criteria:

1. They are ecologically sound;
2. The least environmentally damaging reasonable alternative is selected;
3. Every reasonable effort is made to avoid or minimize damage or loss of fish and wildlife resources and uses;
4. All important recommended means and measures have been adopted, with guaranteed implementation to satisfactorily compensate for unavoidable damage or loss consistent with the appropriate mitigation goal; and
5. For wetlands and shallow water habitats, the proposed activity is clearly water dependent and there is a demonstrated public need.

The Service may recommend the "no project" alternative for those projects which do not meet all of the above criteria, and where there is likely to be a significant fish and wildlife resource loss.

When projects impacting waterways or wetlands are deemed acceptable to the Service, we recommend full mitigation for any impacts to fish and wildlife. The Council on Environmental Quality regulations for implementing the National Environmental Policy Act define mitigation to include: 1) Avoiding the impact; 2) minimizing the impact; 3) rectifying the impact; 4) reducing or eliminating the impact over time; and 5) compensating for impacts. The Service supports and adopts this definition of mitigation and considers the specific elements to represent the desirable sequence of steps in the mitigation planning process. Accordingly, we maintain that the best way to mitigate for adverse biological impacts is to avoid them altogether.

The document should describe all measures proposed to avoid, minimize, or compensate for impacts to fish and wildlife and their habitats. The measures should be presented in as much detail as possible to allow us to evaluate their probable effectiveness.

Because of their very high value to migratory birds, and their ever-increasing scarcity in California, our mitigation goal for wetlands (including riparian and riverine wetlands) is no net loss of in-kind habitat value or acreage (whichever is greater).

For unavoidable impacts, to determine the mitigation credits available for a given mitigation project, we evaluate what conditions would exist on the mitigation site in the future in the absence of the mitigation actions, and compare those conditions to the conditions we would expect to develop on the site with implementation of the mitigation plan.

Mitigation habitat should be equal to or exceed the quality of the habitat to be affected by the project. Baseline information would need to be gathered at the impact site to be able to quantify this goal in terms of plant species diversity, shrub and tree canopy cover, stems/acre, tree height, etc. The ultimate success of the project should be judged according to these same measurements at the mitigation site.

Criteria should be developed for assessing the progress of the project during its developmental stages as well. Assessment criteria should include rates of plant growth, plant health, and evidence of natural reproduction. Success criteria should be geared toward equaling or exceeding the quality of the highest quality habitat to be affected. In other words, the mitigation effort would be deemed a success in relation to this goal if the mitigation site met or exceeded habitat measurements at a "model" site (plant cover, density, species diversity, etc.).

The plan should present the proposed ground elevations at the mitigation site, along with elevations in the adjacent areas. A comparison of the soils of the proposed mitigation and adjacent areas should also be included in the plan, and a determination made as to the suitability of the soils to support habitats consistent with the mitigation goals.

Because wetland ecosystems are driven by suitable hydrological conditions, additional information must be developed on the predicted hydrology of the mitigation site. The plan should describe the depth of the water table, and the frequency, duration, areal extent, and depth of flooding which would occur on the site. The hydrologic information should include an analysis of extreme conditions (drought, flooding) as well as typical conditions.

The plan must include a timeframe for implementing the mitigation in relation to the proposed project. We recommend that mitigation be initiated prior to the onset of construction. If there will be a substantial time lag between project construction and completion of the mitigation, a net loss of habitat values would result, and more mitigation would be required to offset this loss.

Generally, monitoring of the mitigation site should occur annually for at least the first five years, biennially for years 6 through 11, and every five years thereafter until the mitigation has met all success criteria. Remediation efforts and additional monitoring should occur if success criteria are not met during the first five years. Some projects will require monitoring throughout the life of the project. Reports should be prepared after each monitoring session.

The plan should require the preparation of "as-built" plans. Such plans provide valuable information, especially if the mitigation effort fails. Similarly, a "time-zero" report should be mandated. This report would describe exactly what was done during the construction of the mitigation project, what problems were encountered, and what corrections or modifications to the plans were undertaken.

The plan should detail how the site is to be maintained during the mitigation establishment period, and how long the establishment period will be. It will also be important to note what entity will perform the maintenance activities, and what entity will ultimately own and manage the site. In addition, a mechanism to fund the maintenance and management of the site should be established and identified. A permanent easement should be placed on the property used for the mitigation that would preclude incompatible activities on the site in perpetuity.

Finally, in some cases, a performance bond may be required as part of the mitigation plan. The amount of the bond should be sufficient to cover the costs of designing and implementing an adequate mitigation plan (and purchasing land if needed) should the proposed plan not succeed.

Reference

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deepwater habitats of the United States. FWS/OBS-79/31. U.S. Fish and Wildlife Service, Washington, D.C. 103 pp.