

Final Environmental Impact Statement

Clearing of Phreatophytic Vegetation
From The Salt And Gila Rivers
Ninety-First Avenue To Gillespie Dam
Maricopa County, Arizona



Department of the Interior
U.S. Fish and Wildlife Service
Region 2

FINAL
ENVIRONMENTAL IMPACT
STATEMENT

Clearing of Phreatophytic Vegetation
from the Salt and Gila Rivers
Ninety-first Avenue to Gillespie Dam
Maricopa County, Arizona

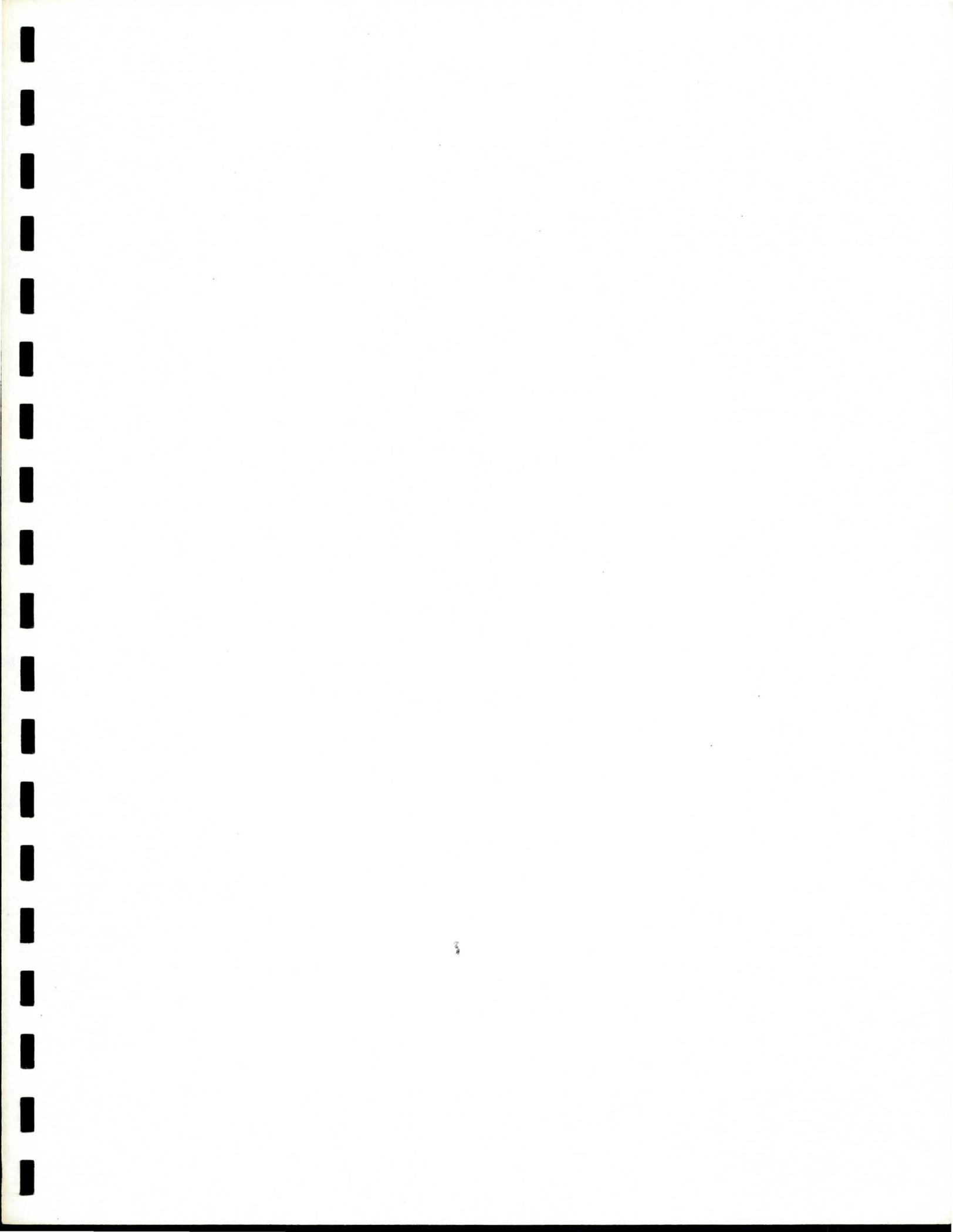
November 1981

Department of the Interior
United States Fish and Wildlife Service
Region 2

Prepared by
Flood Control District of
Maricopa County

with the assistance of

Benham-Blair & Affiliates, Inc.
Environmental Services
Oklahoma City, Oklahoma



COVER SHEET

Clearing of Phreatophytic Vegetation from the Salt and
Gila Rivers, Ninety-first Avenue to Gillespie Dam,
Maricopa County, Arizona

Draft () Final (x) Environmental Impact Statement (EIS)

Lead Agency

U.S. Department of Interior, Fish and Wildlife Service

Abstract

This EIS assesses the environmental consequences of issuing a Certificate of Compatibility for the clearing of a 1,000-foot-wide corridor of vegetation from the Salt and Gila rivers between Ninety-first Avenue to Gillespie Dam. Alternatives assessed are: an alternative 1,000-foot-wide clearing recommended by the U.S. Fish and Wildlife Service, an alternative 2,000-foot-wide clearing, and the no action alternative. The proposed action is designed to reduce flooding along the Salt and Gila rivers.

The key issues on which this EIS focuses are:

impacts on vegetation, wildlife habitat, and dove productivity;
value in minimizing flood damages; erosion and deposition of
sediments; and degradation of air quality.

EIS Contact

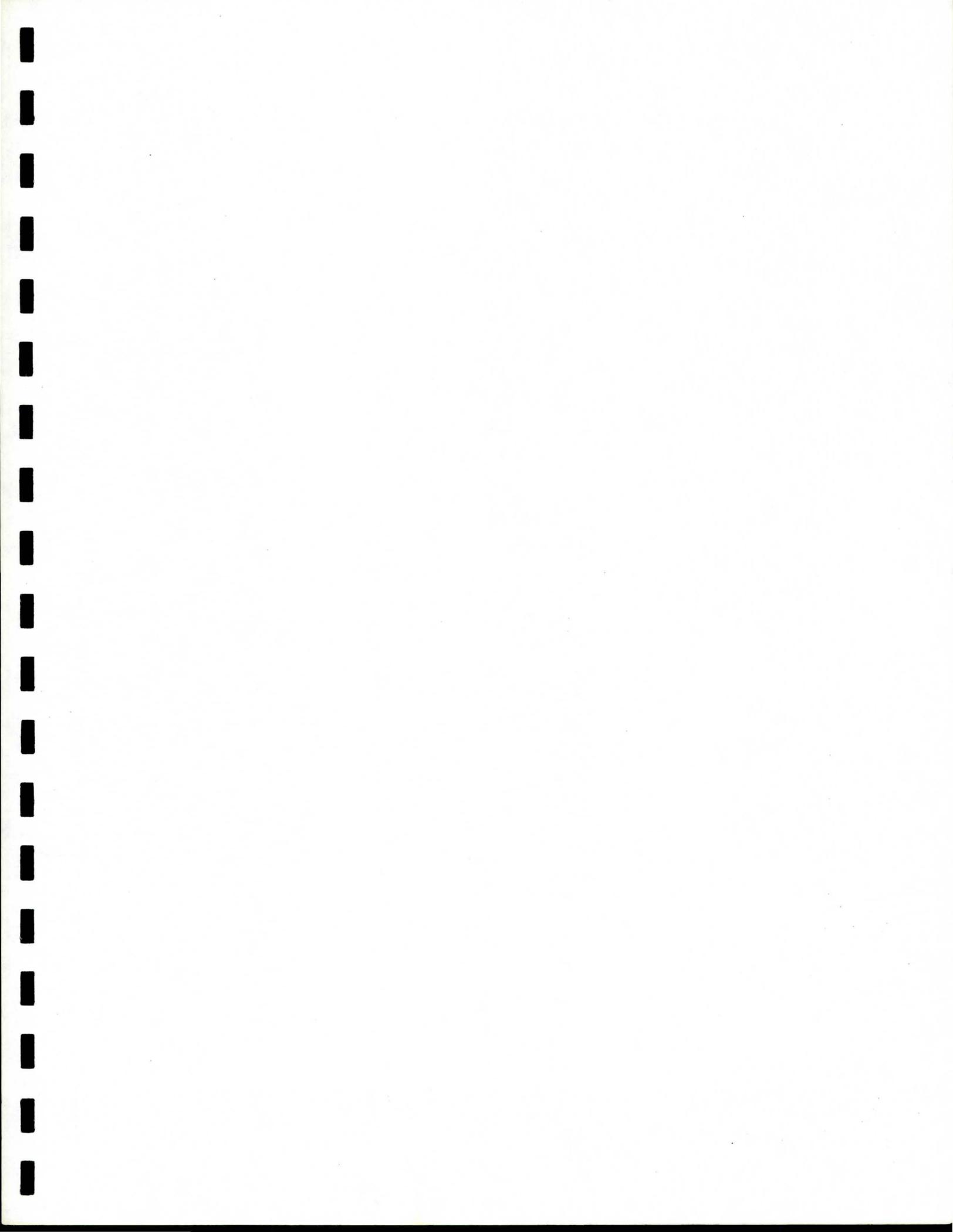
Questions and comments about this EIS should be directed to:

Ron McKinstry, Wildlife Biologist
United States Department of the Interior
Fish and Wildlife Service
Ecological Services
2934 West Fairmount Avenue
Phoenix, Arizona 85017
Phone: Commercial: (602) 241-2493
FTS: 261-2493

Date Statement Made Available to CEQ and the Public:

Draft: June 10, 1981

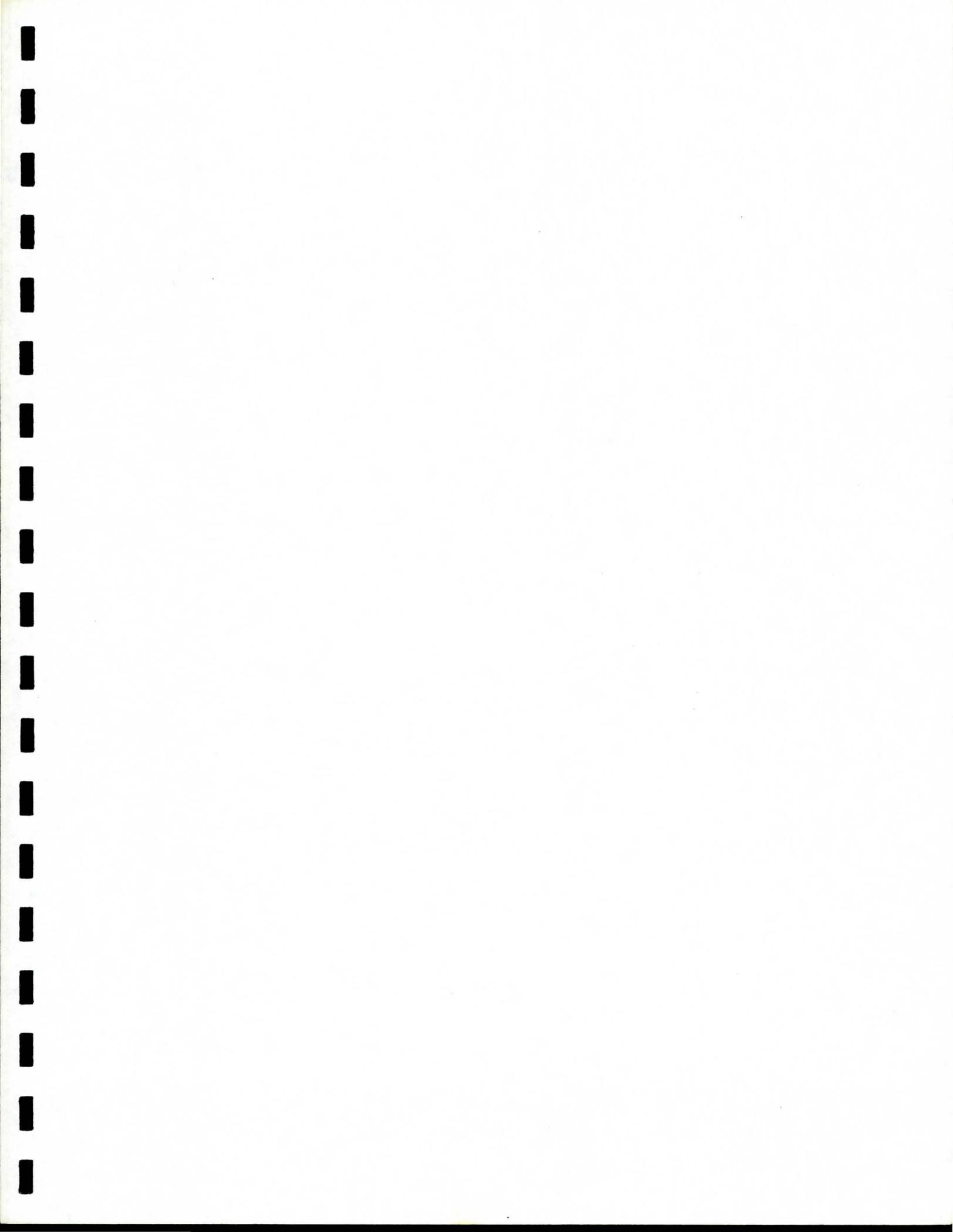
Final:



PREFACE

The final environmental impact statement consists of two volumes. The first volume was originally distributed as the draft environmental impact statement (DEIS) in June 1981. Comments on the DEIS did not require significant changes in data, analysis, or conclusions. Therefore, the DEIS has not been reprinted.

The second volume contains Chapter 5 -- Consultation and Coordination in the Review of the DEIS. Included are review comments on the DEIS and corrections and revisions to the DEIS.



SUMMARY

The Flood Control District (FCD) of Maricopa County, Arizona, proposes to clear and maintain a corridor in the Salt and Gila rivers that is free of phreatophytic vegetation from Ninety-first Avenue in Phoenix downstream to Gillespie Dam, approximately 36 miles. The FCD is required to obtain a Certificate of Compatibility (Right-of-Way) from the U.S. Fish and Wildlife Service (FWS) due to the federal lands committed for wildlife use that would be involved. A large portion of the land that would be maintained clear of vegetation was withdrawn from the public domain and reserved by Public Land Order (PLO) 1015 for use by the Arizona Game and Fish Department (AGFD) under the jurisdiction of the Department of Interior in connection with the Gila River Waterfowl Area Project.

The proposed clearing action is to develop and maintain a cleared and graded 1,000-foot-wide corridor within the floodway of the Salt and Gila rivers following an alignment based on maximizing the hydraulic characteristics of the river channel by minimizing channel length. The proposed corridor includes 4,130 acres, of which 1,510 acres would require clearing initially. Thereafter, at 2-year intervals for the projected 25-year life of the project, as many as 4,130 acres would require maintenance clearing. Procedures for clearing would consist of clearing, grubbing, and grading operations within the designated area for the purpose of removing trees, shrubs, and debris that may inhibit water flow and to grade or contour the cleared area for drainage and low-water flow.

In addition to this proposed action, two alternatives considered in detail include the proposed 1,000-foot-wide clearing described above as modified by the FWS to avoid significant wildlife habitat (alternative 1) and a 2,000-foot-wide clearing following the same centerline alignment as the proposed action (alternative 2). The no action alternative (alternative 3) was also considered.

AREAS OF CONTROVERSY

During the early stages of the environmental impact statement (EIS) development, several areas of controversy related to the proposed action were identified. Of major concern would be the loss of wildlife habitat on lands designated for wildlife management use, i.e., PLO 1015 lands, Arizona Game and Fish Commission (AGFC) lands, and Fred J. Weiler Greenbelt lands. The riparian vegetation in these areas supports one of the more important white-winged dove and mourning dove nesting habitats in Arizona.

The benefit of the proposed action in terms of minimizing damages and inconveniences due to flooding was identified as another area requiring assessment. Area homeowners, businessmen, and farmers expressed concern about personal inconvenience and damages to health and property experienced during recurring flooding.

Other identified issues included the effect of open burning of cleared debris and the increased potential for erosion and deposition.

MAJOR IMPACT CONCLUSIONS

The major environmental impacts of the proposed action and alternatives discussed here are detailed in Chapter 4 of this EIS. A comparison of the impacts is presented in Table 2.4-1.

AIR QUALITY

Under the proposed action, local air quality would be temporarily degraded during the initial clearing activities on 1,510 acres due to particulates generation during the mechanical disturbance of the surface soils, emissions from construction equipment during clearing operations, and the open burning of cleared vegetation and debris. Air quality degradation under alternatives 1 and 2 would originate from the activities associated with clearing 990 and 3,280 acres, respectively.

Under the proposed action, air quality degradation during the ongoing 2-year maintenance clearing would include particulates generation due to the mechanical disturbance of up to 4,130 acres of ground surface and the associated emissions from construction equipment and the open burning of debris. Air quality degradation due to maintenance activities under alternatives 1 and 2 would originate from activities associated with clearing as many as 4,160 and 8,240 acres, respectively.

Adverse impacts would be localized and short term. Air quality would not be impacted under the no action alternative.

SOILS

The potential for soil erosion would increase due to implementation of the proposed action or either of the alternative clearing actions. The removal of vegetative ground cover and the disturbance of surface soils associated with the clearing actions would result in greater erosion. Under the proposed alternative, increased erosion potential would occur on 1,510 acres. Under alternatives 1 and 2, the potential for soil erosion would increase on 990 and 3,280 acres, respectively. The increased erosion potential would be temporary, decreasing as the low-water channel elevation of the stream is approached. Sediment deposition would occur in adjacent floodplains particularly where vegetation introduces an increased substrate roughness factor, behind stream obstructions such as Arizona Highway 85 Bridge, Gillespie Dam, and within Painted Rock Reservoir. Erosion and deposition on adjacent floodplains would be reduced due to the lesser frequency of flooding.

HYDROLOGY

Implementation of the proposed action would increase the capacity of the channel of the Salt and Gila rivers to convey floodwaters. The removal of vegetation would result in decreases in mean cross-sectional depth and resistance to flow, and an increase in the mean cross-sectional velocity. Under the proposed action and alternative 1, the increase in channel capacity would be similar. Under alternative 2, the channel

capacity would be greater than that under the proposed action or alternative 1; however, the significance of this difference would decrease with increase in flow. Under the no action alternative, the channel capacity to convey floodwaters would not be changed.

Temporary degradation of water quality due to increased turbidity, total dissolved solids, and siltation would follow implementation of the proposed action or either of the two clearing alternatives.

VEGETATION

The removal of vegetation, predominantly mature stands of salt cedar, would be one of the more significant impacts of the clearing alternatives.

Under the proposed action, approximately 1,510 acres of vegetation would be cleared and a total of 4,130 acres maintained clear of vegetation for the 25-year life of the project. Implementation of alternative 1 would require the initial removal of 990 acres; however, as under the proposed action, the entire corridor, 4,160 acres, would be subject to clearing at 2-year intervals. The corresponding acreages affected under alternative 2 would be 3,280 and 8,240 acres, respectively.

WILDLIFE

The most significant impact on wildlife would be the initial loss of existing wildlife habitat and the continued loss of the total areas within either of the clearing alternatives for the 25-year life of the project. Associated with the habitat loss would be a loss in white-winged dove and mourning dove reproduction. All clearing alternatives traverse areas considered to be some of the highest quality dove nesting habitats in Arizona. Under the proposed action, estimated annual losses of 29,000 young of the white-winged dove and 24,650 young of the mourning dove would occur. These estimates are based on the acreages of mature salt cedar that would be cleared at the beginning of the project.

Corresponding losses of 19,100 white-winged dove and 16,235 mourning dove and 63,600 white-winged dove and 54,060 mourning dove are estimated following implementation of either alternative 1 or alternative 2, respectively.

No threatened or endangered species would be affected by either of the alternative clearing actions.

FISHERIES

The most significant impact to fisheries would be the temporary degradation of the habitat due to increased turbidity and siltation resulting from the clearing activities and long-term increased water temperatures due to loss of shade from vegetation adjacent to bodies of water. Impacts due to either of the proposed clearing actions would be similar.

No threatened or endangered fish species would be affected following implementation of the proposed action or the alternatives.

CULTURAL RESOURCES

No known cultural resources sites would be affected by implementation of either the proposed action or alternative 1. However, five prehistoric sites are known to occur within the alternative 2 clearing that would be subject to damage if this alternative were implemented. In addition, the potential for additional buried sites within all three clearing alternatives has been identified. No intensive surface or subsurface survey has been conducted for either of the alternative corridors.

No national historic sites would be affected by either of the alternatives.

LAND USE

Under the proposed action, approximately 1,864 acres of PLO 1015 lands, 118 acres of greenbelt, 162 acres of AGFC lands, and 1,124 acres of private lands would be directly affected by the proposed action. The

increased channel capacity following implementation would reduce flood damage to lands utilized for agricultural, residential, commercial, and recreational land use. Approximately 3,087 acres of cropland, 93 residences, 4 commercial establishments, and 70 acres of parks and golf courses would be protected from inundation during a 100-year flood event.

Under alternative 1, a slightly larger portion of the lands to be directly affected would be privately owned. Acreage to be traversed by the clearing would include 1,774 acres of PLO 1015 lands, 118 acres of greenbelt, 213 acres of AGFC lands, and 1,291 acres of private lands. Flood protection afforded under alternative 1 would be similar to that of the proposed action.

Alternative 2 would directly affect 3,530 acres of PLO 1015 lands, 229 acres of greenbelt, 293 acres of AGFC lands, and 2,423 acres of private lands. Flood protection afforded to a 100-year flood event would not be significantly greater than that afforded by either the proposed action or alternative 1.

TRANSPORTATION

Implementation of either of the proposed actions would have only a minor effect on transportation facilities within the study area. Implementation of the proposed action or either clearing alternative would reduce the number of miles of paved roads damaged during a 100-year flood event from 42 to 34. Under the no action alternative approximately 175 miles of dirt road would be damaged during a 100-year flood event. Following implementation of either the proposed action or alternative 1 this would be reduced to 151 miles; under alternative 2, it would be reduced to 148 miles. Flood damage to bridges would be dependent on flood volume and bridge capacity. The capacity of all existing bridges would be exceeded during a 100-year flood event following implementation of either of the clearing actions.

SOCIOECONOMICS

Estimated capital costs for developing and maintaining cleared corridors were calculated for the proposed action and alternatives 1 and 2. Using a discount rate of 3 percent per annum (the interest rate specified by the Arizona Department of Water Resources for flood control projects), the annual equivalent cost for the proposed action was calculated to be approximately \$236,791. The equivalent annual project costs for alternatives 1 and 2 were calculated to be approximately \$179,263 and \$432,461, respectively.

Monetary benefits to be realized following implementation of either of the clearing actions would consist mainly of the reduction in flood damage that would occur during the 25-year life of the project. Flood event damages, based on actual damage costs suffered during recent floods, were adjusted by frequency of occurrence, and expected damages over the life of the project were ascertained. The difference between the no action alternative and each of the clearing alternatives would be the benefits derived by implementation of either alternative. Annual benefits for the proposed action and alternative 1 were considered to be equal and were calculated to be approximately \$129,781. For alternative 2, the annual benefit would total approximately \$134,321.

Social benefits to result from implementation of either of the clearing actions would be the sense of well-being felt by local residents that some type of flood control was being implemented. Although this benefit cannot be measured, a sense of well-being would not occur under the no action alternative.

ENERGY

The most significant impact on energy by the project implementation would be the fuel requirements for developing and maintaining either of the clearing alternatives for the 25-year life of the project. Total energy requirements under alternative 2 would be approximately twice that projected for either the proposed action or alternative 1.

MITIGATING MEASURES

The following measures are proposed to mitigate the adverse impacts of the proposed action or alternatives:

- Confine open burning activities to periods when the wind is from the east;
- Implement dust control measures during construction activities near populated areas;
- Develop wildlife habitats within AGFC lands to replace loss of habitat; and
- Consult with the Arizona State Historic Preservation Officer and the Arizona Advisory Council on Historic Preservation to ascertain future requirements for addressing cultural resources that may be affected.

AGENCY-PREFERRED ALTERNATIVE

After assessing the impacts and issues associated with the FCD proposed vegetative clearing project and its alternatives, the FWS has determined that the agency-preferred alternative is alternative 1 for the reasons identified below:

- Alternative 1 would require the clearing of the smallest area of wildlife habitat;
- Alternative 1 would affect the least area of PLO 1015 and AGFC lands; and
- The financial benefits of alternative 1 in terms of reduction of flood damages relative to project costs would be greater than for either the proposed action or alternative 2.

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5.0 CONSULTATION AND COORDINATION IN THE REVIEW OF THE DRAFT EIS

5.1 REVIEW OF THE DRAFT EIS

The U.S. Fish and Wildlife Service (FWS) published a Notice of Intent to Prepare an Environmental Impact Statement in the Federal Register, volume 46, number 34, February 20, 1981, pg. 13379. A draft environmental impact statement (DEIS) was prepared and made available for public review on June 10, 1981. Agencies and individuals requesting copies of the DEIS are presented in Table 5.1-1. Written comments were received from 17 reviewers during the review period ending on September 15, 1981. Each letter was reviewed to determine whether it contained substantive comments that required a response in the final environmental impact statement (FEIS).

Comments that presented new data, questioned facts and/or analyses, or made observations about the issues bearing directly on the DEIS or the environmental impacts of the proposed action were evaluated and responded to. Comment letters and responses are presented in section 5.2.

Errata and those portions of the DEIS that have been substantially corrected or modified in response to reviewer comments are presented in section 5.3.

TABLE 5.1-1

Agencies, Organizations, and Individuals
To Whom Copies of the Draft EIS Were
Provided for Review

Federal

Soil Conservation Service
U.S. Army Corps of Engineers
Bureau of Reclamation
Bureau of Land Management
U.S. Senator Dennis De Concini
U.S. Representative Bob Stump
U.S. Environmental Protection Agency
U.S. Department of Health and Human Services

State

Arizona Office of Economic Planning and Development
Arizona Game and Fish Department
Arizona State Land Department
Arizona Department of Water Resources
Arizona Department of Health Services,
Bureau of Water Quality Control
Governor's Commission on Arizona Environment
Office of the Governor
Chairman, Natural Resources Committee,
Arizona State Senate

Bob Denny, State Representative
Jim Ratliff, State Representative
Chairman, Agricultural Committee, Arizona House
of Representatives

Local and Other Governments

Gila River Indian Community
Mayor, City of Buckeye
Maricopa County Board of Supervisors
Flood Control District of Maricopa County
Mayor, City of Avondale
Roosevelt Irrigation District
Mayor, City of Phoenix
Buckeye-Roosevelt Natural Resource Conservation District
Buckeye Irrigation District

Private Environmental Groups

Arizona Conservation Council
Audubon Society
Sierra Club
Wildlife Society, Arizona Chapter
The Nature Conservancy
Arizona Wildlife Federation
Defenders of Wildlife

Other Private Groups and Individuals

Holley Acres Flood Control Association

Buckeye Valley News

Mr. Chester D. McNabb, Arlington, Arizona

Mr. Adron W. Reichert, Litchfield Park, Arizona

Mr. Kyle Hindman, Buckeye, Arizona

Mr. Paul Perry, Buckeye, Arizona

Mr. Wilbur Weigold, Buckeye, Arizona

Mr. Hank Newberry, Buckeye, Arizona

Mr. Terry Hudgins, Arizona Public Service Company

Mr. James R. Carter, III, Buckeye, Arizona

Mr. Gary Hunt, Benham-Blair & Affiliates, Inc.

Mr. Theron Smith, Oklahoma City, Oklahoma

Mr. Dennis Stadel, Scottsdale, Arizona

Mr. William Gillard, Buckeye, Arizona

Envirosphere Company, Newport Beach, California

Dames & Moore, Phoenix, Arizona

Mr. Doug Miller, Fennemore, Craig, Von Ammon and Udall,
Phoenix, Arizona

5.2 COMMENT LETTERS AND RESPONSES

All agencies, organizations, and individuals providing comments on the DEIS are listed in Table 5.2-1. Their written comments are reproduced in the following pages. Each letter is numbered in order of its position in this report. On each letter, each comment requiring a written response also has been numbered.

Responses, numbered to correspond to the specific comment, immediately follow the comment letter to which they refer.

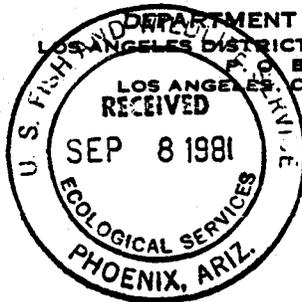
TABLE 5.2-1

Listing of Comment Letters Received
during Review of the Draft EIS

| Review Agency | Designated Number |
|---|-------------------|
| FEDERAL | |
| Department of the Army | 1 |
| Department of Health and Human Services | 2 |
| Department of the Interior | |
| Bureau of Land Management, Arizona State Office | 3 |
| Bureau of Land Management, Phoenix District Office | 4 |
| Bureau of Reclamation | 5 |
| Environmental Protection Agency | 6 |
| STATE AND LOCAL AGENCIES | |
| Arizona Game and Fish Department | 7 |
| Arizona State Land Department | 8 |
| Department of Water Resources | 9 |
| Flood Control District of Maricopa County | 10 |
| Arizona State Clearinghouse | 11 |
| Arizona Natural Heritage Program | 12 |
| Department of Transportation | 13 |
| Maricopa Association of Governments | 14 |
| Maricopa Association of Governments | 15 |
| Department of Water Resources | 16 |
| Department of Health Services | 17 |
| Agriculture and Horticulture Department | 18 |
| Arizona Commission of Agriculture and Horticulture | 19 |
| ASSOCIATIONS | |
| Royden Engineering Company | 20 |
| Maricopa Audubon Society | 21 |



IN REPLY REFER TO
SPLED-EP



DEPARTMENT OF THE ARMY
LOS ANGELES DISTRICT, CORPS OF ENGINEERS
BOX 2711
LOS ANGELES, CALIFORNIA 90055

1 September 1981

Mr. Ron McKinstry, Wildlife Biologist
United States Department of the Interior
Fish and Wildlife Service
Ecological Services
2934 West Fairmount Avenue
Phoenix, Arizona 85017

| ✓ | PKMS | DATE | INIT. |
|---|--------|--------|-------|
| | METZ | 9/7/81 | |
| | BURTON | | |
| | COOPER | | |
| | FITZ | | |
| | FURNER | | |
| | GRANT | | |
| | HODMAN | | |
| | McKIN | 9/8/81 | |
| | NESTA | | |
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Dear Mr. McKinstry:

The Environmental Planning Section of the Los Angeles District, Corps of Engineers has reviewed the draft environmental impact statement for the Clearing of Phreatophytic Vegetation From the Salt and Gila Rivers, Ninety-First Avenue to Gillespie Dam, Maricopa County, Arizona. The following comments are in response to specific items within the draft EIS and are noted by page and paragraph number.

- 1-1 a. Page 8, paragraph 1.4.2.2 and page 13, paragraph 2.2. The Central Arizona Water Control Study (CAWCS) is no longer considering levees along the Salt and Gila Rivers to provide long-term flood control. This element was eliminated during the Phase II stage of the study due to an extremely high benefit/cost ratio.
- 1-2 b. Page 12, paragraph 2.1.1.2, Scope. You state that fill and backfill would be part of the earthwork for open channels. Any placement of fill within the Salt and Gila Rivers is subject to the Section 404 permit process. It will be necessary for you to make application with the Corps of Engineers for the permit.
- 1-3 c. Pages 98-100, Wildlife. It is not possible for us to compare the significance of clearing and operation impacts as there is no data (tabular or discussion) given for the operation impacts associated with any of the alternatives.
- d. Page G-2, Plate B. This plate shows the confluences of the Aqua Fria and Gila Rivers. This area has been designated as flowage easement under the New River and Phoenix City Streams flood control project. It will be necessary for you to coordinate your clearing activities with us.
- e. Mitigation lands for two Corps projects are located in the study area. The lands are under management by the Arizona Game and Fish

SPLED-EP

1 September 1981

Mr. Ron McKinstry, Wildlife Biologist

Department. It is difficult to tell from the plates whether our mitigation lands would be impacted by channel clearing. Based on our coordination with AGFD, a corner of the larger mitigation area may be removed by channel clearing activities. AGFD has been involved in the mitigation proposed to accompany this channel clearing project and stated they felt the mitigation would compensate for the small loss to our mitigation area.

Thank you for the opportunity to review and comment on the draft EIS.

Sincerely,

for. Walter Raketic
NORMAN ARNO
Chief, Engineering Division

Responses to comments in Letter 1.

1-1 Pages 8 and 13 of the DEIS have been revised.

1-2 The placement of any fill within the Salt and Gila rivers will be subject to the Section 404 permit process. Page 12 of the DEIS has been revised to state this.

1-3 Pages 98-99 of the DEIS have been revised.

Page 2 - U.S. Fish and Wildlife Service

We appreciate the opportunity to review this Draft EIS. Please send us one copy of the Final EIS when it becomes available. If you should have any questions regarding our comments, please call Robert Kay of my staff at 404-262-6649.

Sincerely yours,

Frank S. Lisella, Ph.D.
Chief, Environmental Affairs Group
Environmental Health Services Division
Center for Environmental Health

Responses to comments in Letter 2.

- 2-1 Channelization as used within the DEIS refers to provision of a channel clear of vegetation. A channel will not be excavated. Earth moving will be limited to light grading activities.
- 2-2 Pages 35 and 37 and 84, 85, and 89 of the DEIS have been revised to include a discussion of applicable Arizona surface water quality standards.
- 2-3 Pages 85 and 89 of the DEIS have been revised.
- 2-4 Pages 120 and 122 of the DEIS have been revised.
- 2-5 As stated on page 12 of the DEIS, all trees and logs suitable for firewood will be made available to members of the Gila River Indian Community.

- 4-4 5. Page 42-2. The current nomenclature for velvet mesquite is Prosopis velutina.
- 4-5 6. Page 43 - Table 3.7-1. The current nomenclature for creosote is Larrea divaricata spp. tridentata.
- 4-6 7. Page 46-1. Two plant species on the February 1981 Arizona Natural Heritage Program Special Plant List and the BLM Sensitive Species List have been documented near the EIS area. Disk water hyssop (Bacopa rotundifolia) has been collected between Phoenix and Maricopa along the Gila River and roughseed spurge (Euphorbia trachysperma) has been collected south of Wintersburg. These species while not officially endangered may be worthy of consideration in your final environmental statement.
- 4-7 8. Page 98-3. Why are only doves discussed under the impacts to wildlife? Significant losses to the overall animal life in the area should be discussed. Losses of habitat edge and its effect on overall species richness in the area should also be discussed.
- 4-8 9. Page 107-1. Recreation related impacts are not discussed in enough detail to effectively analyze the alternatives. Quantification of the gains or losses of recreation days under each alternative should be included in the EIS.
- 4-9 The consumer surplus value resulting from the recreational experience should also be quantified and included in the economics section. If the alternative action results in a loss of recreation days resulting in a loss of consumer surplus dollars, this loss should be subtracted from the benefits side of the benefit/cost analysis.
- 4-10 10. Page 114-2. In this paragraph the assumption is made that the proposed federal flood control projects (CAWCS alternatives) will control flows in the river to approximately 50,000 cfs and that the natural riverbed should be able to safely pass this flow without maintenance of a cleared corridor. This implies that at the present channel capacity a 50,000 cfs flow can be safely transmitted through the natural riverbed. If the river will safely pass this flow without the cleared corridor the benefits attributed to damage savings in the 50 year flood event (50,000 cfs) should be deleted from the benefit/cost analysis.

- 4-11 11. Page 114-3. The EIS implies that because funding for the project will come from state and local sources a 3 percent discount rate is correct. What influence does the funding source, i. e. Federal, state, or local, have on the discount rate used? Is three percent a realistic discount rate when current economic conditions are considered? What are the results of the benefit/cost analysis if a realistic discount rate is used, i.e. 10 percent?
- 4-12 12. Page 119 (Table 4.11-4). It is not clear how this table evolved from the table on page 118. The figures cannot be checked for accuracy based on the information given in the EIS.
- 4-13 13. Page 120-1 121-3, 122-2. The benefit/cost analysis reveals that all the alternatives have benefit/cost ratios below 1:1. Based on this analysis, no alternative is cost-effective. Our recommendation is that the alternatives should be analyzed using a 4-year maintenance schedule to determine if they can be made cost-effective.
- 4-14 14. Page 124-2. The mitigation plan does not address mitigation factors if the 1000 ft. FWS alternative is not selected. A plan should be included for all the alternatives other than no action. Also, the effects of the mitigation plan are undocumented in the EIS.



Responses to comments in Letter 4.

- 4-1 A 2-year maintenance schedule is necessary due to the rapid growth of salt cedar. According to the Flood Control District of Maricopa County, a 2-year maintenance schedule is the most feasible.
- 4-2 Page 30 of the DEIS has been revised.
- 4-3 Page 42 of the DEIS has been revised.
- 4-4 Page 42 and Table 3.7-1 of the DEIS have been revised.
- 4-5 Table 3.7-1 of the DEIS has been revised.
- 4-6 Page 46 of the DEIS has been revised to include this information.
- 4-7 Major emphasis was placed on the impact of the proposed alternatives on the mourning dove and the white-winged dove due to their recreational significance. However, implementation of any of the three clearing plans will adversely affect all wildlife species dependent on existing conditions. The clearing project should increase the area of habitat edge available for wildlife.
- 4-8 Quantitative information regarding recreational use of the project area is not available according to contacts with the Arizona Outdoor Recreation Coordinating Commission and the Bureau of Reclamation. Although the area offers a wide variety of uses, use is unorganized and unstructured. Recreational use day losses or gains attributable to the alternative actions should be insignificant.
- 4-9 Interviews with local businesses indicated that recreational use of the area generates no appreciable income as most users are of local origin or are from the Phoenix area.

- 4-10 Page 114 of the DEIS has been revised. Estimates for flood damages due to a 50,000 cfs flow within the project area are reported in Table 4.11-3.
- 4-11 The legislation authorizing the proposed clearing project, Arizona House Bill 2457, has provisions for making grant money available at 3-percent interest. The benefits of the alternative project proposals would be less if the cost/benefit analysis utilized a 10-percent discount rate.
- 4-12 Table 4.11-4 of the DEIS has been revised.
- 4-13 See response to Comment 4-1.
- 4-14 Pages 124-127 in the DEIS have been revised.



5

United States Department of the Interior

Bureau of Reclamation
WATER AND POWER RESOURCES SERVICE
LOWER COLORADO REGIONAL OFFICE
P.O. BOX 427
BOULDER CITY, NEVADA 89005



IN REPLY
REFER TO: LC-155A
120.1

SEP 2 1981

Memorandum

To: Regional Director, Division of Ecological Services, Fish and Wildlife Service, 2934 W. Fairmount Avenue, Phoenix, AZ 85017

ACTING
From: Regional Director

Subject: Fish and Wildlife Service Environmental Impact Statement on Clearing of Phreatophytic Vegetation from the Salt and Gila Rivers Ninety-First Avenue to Gillespie Dam, Maricopa County, Arizona (DES 81-28-(your memorandum to the Commissioner dated June 10, 1981))

| ✓ | NAME | DATE | INIT. |
|---|---------|------|-------|
| | NETZ | | |
| | BRADON | | |
| | CRONIN | | |
| | LEE | | |
| | FRANCO | | |
| | LOREN | | |
| | ROBERTS | | |
| | SMITH | | |
| | WESSA | | |
| | Henry | | |

We have reviewed the subject document and offer the following comments.

5-1 The expressed conclusions concerning endangered species are not supported by an appropriate reference. Reference should be made of specific communications with the Fish and Wildlife Service (FWS) regarding the proposed project. The indicated reference (U.S. Fish and Wildlife Service 1980) does not demonstrate compliance with Section 7(c)(1) of the Endangered Species Act of 1973.

5-2 The air quality discussion does not describe the post-construction condition of the surface soil. Will some type of mitigation (i.e. mulch, rock armoring) be employed to reduce wind erosion?

No mitigation is proposed to reduce water erosion. With the loss of vegetative cover from the sides of the channel, gully erosion could become a problem.

5-3 There is no discussion of the potential for off-road vehicle use of the cleared channel. Such uses frequently occur in the area. Will off-road vehicle use be restricted?

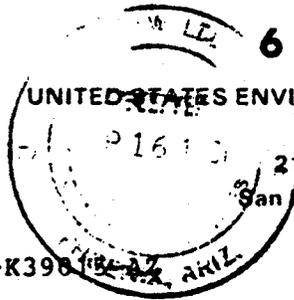
The document generally appears adequate for the purpose intended and we noted no other deficiencies or errors significant enough to comment on.

Roy D. Gear

cc: Project Manager, Phoenix, AZ, Attention: 150

Responses to comments in Letter 5.

- 5-1 A memorandum from A. Jackson, Area Manager, U. S. Fish and Wildlife Service, Phoenix, Arizona, concerning Intra-Service Section 7 Consultation on threatened and endangered species in the project area has been referenced on pages 95 and 99 in the DEIS.
- 5-2 Approximately one-half to two-thirds of the project area is now without vegetative cover with no significant wind erosion problems reported. Therefore, no mitigation plan for cleared areas has been proposed. Water erosion is not anticipated to be a significant problem, since annual rainfall averages only 7 inches per year.
- 5-3 There are no plans to restrict off-road vehicle use in the project area.

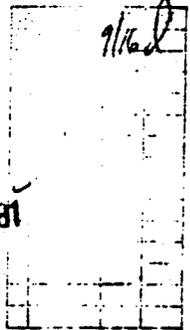


UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IX

215 Fremont Street

San Francisco, Ca. 94105



Project #D-SFW-K398 (B-42, AKIL)

Ron McKinstry, Wildlife Biologist
Ecological Services
U.S. Fish and Wildlife Service
2934 West Fairmount Avenue
Phoenix, AZ 85017

14 SEP 1981

Dear Mr. McKinstry:

The Environmental Protection Agency (EPA) has received and reviewed the Draft Environmental Impact Statement (DEIS) titled CLEARING OF PHREATOPHYTIC VEGETATION FROM THE SALT AND GILA RIVERS, MARICOPA COUNTY, ARIZONA.

The EPA's comments on the DEIS have been classified as Category LO-2. Definitions of the categories are provided by the enclosure. The classification and the date of the EPA's comments will be published in the Federal Register in accordance with our responsibility to inform the public of our views on proposed Federal Actions under Section 309 of the Clean Air Act. Our procedure is to categorize our comments on both the environmental consequences of the proposed action and the adequacy of the environmental statement.

The EPA appreciates the opportunity to comment on this DEIS and requests five copies of the Final Environmental Impact Statement when available.

If you have any questions regarding our comments, please contact Susan Sakaki, EIS Review Coordinator, at (415) 556-7858.

Sincerely yours,

Sheila M. Prindiville
Acting Regional Administrator

Enclosure

EIS CATEGORY CODES

Environmental Impact of the Action

LO—Lack of Objections

EPA has no objection to the proposed action as described in the draft impact statement; or suggests only minor changes in the proposed action.

ER—Environmental Reservations

EPA has reservations concerning the environmental effects of certain aspects of the proposed action. EPA believes that further study of suggested alternatives or modifications is required and has asked the originating Federal agency to reassess these aspects.

EU—Environmentally Unsatisfactory

EPA believes that the proposed action is unsatisfactory because of its potentially harmful effect on the environment. Furthermore, the Agency believes that the potential safeguards which might be utilized may not adequately protect the environment from hazards arising from this action. The Agency recommends that alternatives to the action be analyzed further (including the possibility of no action at all).

Adequacy of the Impact Statement

Category 1—Adequate

The draft impact statement adequately sets forth the environmental impact of the proposed project or action as well as alternatives reasonably available to the project or action.

Category 2—Insufficient Information

EPA believes that the draft impact statement does not contain sufficient information to assess fully the environmental impact of the proposed project or action. However, from the information submitted, the Agency is able to make a preliminary determination of the impact on the environment. EPA has requested that the originator provide the information that was not included in the draft statement.

Category 3—Inadequate

EPA believes that the draft impact statement does not adequately assess the environmental impact of the proposed project or action, or that the statement inadequately analyzes reasonably available alternatives. The Agency has requested more information and analysis concerning the potential environmental hazards and has asked that substantial revision be made to the impact statement.

If a draft impact statement is assigned a Category 3, no rating will be made of the project or action, since a basis does not generally exist on which to make such a determination.

Water Quality Comments

- 6-1 1. The Draft Environmental Impact Statement (DEIS) states on page 89 that "The primary objective in clearing a channel of vegetation would be the reduction of erosion, flood-water, and sediment damages." Since the effects of the proposed clearing on the study area have not been quantified (page 90), it is unclear if the primary objective of the clearing will be met. The FEIS should compare the reduced sediment and erosion rates expected for the study area with the increased sediment and erosion rates caused by channel clearing.
- 6-2 2. The DEIS should describe the special precautions, referred to on page 124, that will be taken to prevent spillage or leakage of fuel and oil from construction equipment.

Air Quality Comments

- 6-3 1. The discussion of air quality in Section 4.2 should be expanded to include an estimate of the increase in wind-blown particulates which would occur following removal of vegetation. An attempt should be made to quantify this impact. Also, the FEIS should more specifically describe the "dust control measures" discussed in Section 4.13.
- 6-4
- 6-5 2. On page 82 of the DEIS, the discussion seems to emphasize the large particle sizes involved, while on page 92, the DEIS notes that "Soils...are comprised to a large degree of fine sediment." This discrepancy should be resolved in the FEIS.

Responses to comments in Letter 6.

- 6-1 The major objective of the proposed clearing action is to reduce damages due to flooding, erosion, and sedimentation in areas adjoining the river. In section 4.11.1.2.2, Project Benefits, reductions in flood-related damages have been quantified.
- 6-2 Page 124 of the DEIS has been revised.
- 6-3 Pages 81-84 of the DEIS have been revised.
- 6-4 Page 123 of the DEIS has been revised.
- 6-5 Page 92 of the DEIS has been revised.

Mr. Ron McKinstry

- 2 -

September 15, 1981

- 7-2 Existing riffle/pool habitat conditions promote and enhance the present aquatic values within the perennial water segments. However, with project action, it is doubtful whether these same values will be retained; in fact, it is anticipated that they will be significantly reduced.

Regarding the proposed action and alternative actions, the Department favors Alternative 1 as the preferred action to facilitate the flow of floodwaters and to alleviate flood-related damage to public and private property and, at the same time, keep impacts on the fish and wildlife resources to a minimum.

Finally, we have included, for the record, copies of two policies passed by the Arizona Game and Fish Commission in reference to phreatophyte clearing and to the flood control programs for the middle Gila.

We appreciate the opportunity to provide these comments on the subject draft environmental impact statement.

Sincerely,

Bud Bristow, Director



Robert K. Weaver
Habitat Evaluation Coordinator
Planning and Evaluation Branch

RKW:dd
Encl.

cc: Don Wingfield, Supervisor, Yuma Regional Office
Don Turner, Supervisor, Mesa Regional Office
State Clearinghouse #81-80-0035

COMMISSION POLICY

Phreatophyte Clearing Projects

WHEREAS, Arizona is recognized nationally for its superior white-winged and mourning dove populations with an annual harvest of over 1,700,000 birds by over 40,000 sportsmen, and

WHEREAS, future dove populations depend directly on available riparian vegetation located along the rivers and streams of Arizona for nesting habitat, and

WHEREAS, large numbers of other small game, song and insectivorous birds, big game, waterfowl and several rare and endangered species of wildlife depend on these riparian areas for cover, and

WHEREAS, hunting, bird watching and other recreational uses of these areas contribute an appreciable sum to the economy of Arizona, and

WHEREAS, vegetation clearing projects are either completed, authorized, proposed or programmed for every major river supporting noteworthy amounts of such vegetation in Arizona, and

WHEREAS, the Arizona Game and Fish Department has evaluated the impact which some federal vegetation eradication projects have had or will have on wildlife within the State of Arizona and has found that the completed projects and the completion of the proposed projects will result in the elimination of valuable small game, big game and waterfowl habitat, severe reduction of a nationally significant dove population, and the potential elimination of several rare and endangered bird species in Arizona, and

WHEREAS, Federal agencies conducting vegetation eradication projects in Arizona have failed to act on the recommendations made by the Game and Fish Department and the U. S. Fish and Wildlife Service for mitigation of wildlife losses, and

WHEREAS, the Arizona Game and Fish Department is charged with the responsibility of the preservation of Arizona's fish and wildlife resources, and

WHEREAS, control of the Arizona Game and Fish Department is vested in the Arizona Game and Fish Commission.

NOW, THEREFORE, BE IT RESOLVED that the Arizona Game and Fish Commission on January 17, 1969 opposes implementation and authorization of future vegetation eradication programs until such programs are evaluated by the sponsoring agencies, development agencies, and the Arizona Game and Fish Department for the purpose of determining the nature and extent of benefits to be derived therefrom, and the nature and extent of resource losses resulting from the projects, and until appropriate recommendations for mitigation of resource losses resulting from the implementation of a clearing project are incorporated in the project.

COMMISSION POLICY

Flood Control Program for the Middle Gila River 91st Avenue to Gillespie Dam

WHEREAS, Public Law 86-645 authorized a flood control project on the Gila and Salt Rivers from Gillespie Dam to McDowell Dam site (Orme Dam) in accordance with the recommendations of the Chief, Army Corps of Engineers in House Document 279 - 86th Congress; and

WHEREAS, based on changes in planning, those portions of the proposed project lying upstream of 91st Avenue were reclassified to a "deferred" category by the Army Corps of Engineers in July 1964; and

WHEREAS, since various Federal and State agencies and conservation and environmental organizations interested in the project were unable to agree on the merits of the remaining portion of the project, the entire project was reclassified to a "deferred" category by the Army Corps of Engineers in September 1965; and

WHEREAS, water releases from the Salt River Project in 1973 and increased runoff from urbanization in the Salt River Valley metropolitan area has accelerated flows along the Salt and Gila Rivers which have resulted in renewed interest and concern of adjacent landowners and citizens in the affected areas; and

WHEREAS, the Arizona Game and Fish Commission resolved on January 17, 1969 to oppose implementation and authorization of future vegetation eradication programs until such programs are evaluated by the sponsoring agencies, development agencies, and the Arizona Game and Fish Department for the purpose of determining the nature and extent of benefits to be derived therefrom, and the nature and extent of resource losses resulting from the projects, and until appropriate recommendations for mitigation of resource losses resulting from the implementation of a clearing project are incorporated in the project; and

WHEREAS, portions of the Gila River were established by the United States Government as the "Fred J. Weiler Resource Conservation Area" in 1972; and

WHEREAS, 6,896 acres of the Gila River flood plain were withdrawn for wildlife purposes in 1954 under Public Land Order 1015 and by agreement with the Bureau of Sport Fisheries and Wildlife were placed under the jurisdiction of the Arizona Game and Fish Commission; and

WHEREAS, the Maricopa County Board of Supervisors has enacted resolutions calling for reactivation of postauthorization studies relative to a flood control program along the Salt and Gila Rivers from 91st Avenue to Gillespie Dam; and

WHEREAS, the Arizona Game and Fish Commission and Department desire and request that all alternatives to flood control, including but not limited to flood plain zoning and acquisition of flood prone lands be explored,

COMMISSION POLICY

Flood Control Program for the Middle Gila River 91st Avenue to Gillespie Dam

NOW THEREFORE BE IT RESOLVED that the Arizona Game and Fish Commission does not oppose a reactivation of postauthorization studies for flood control from 91st Avenue to Gillespie Dam provided that all alternatives are explored and that the studies are conducted in accordance with the National Environmental Policy Act of 1969, the Fish and Wildlife Coordination Act of 1958, as amended, and all other federal, state, and local laws and ordinances.

Responses to comments in Letter 7.

- 7-1 Construction activities will be limited to the clearing of vegetation and light grading.
- 7-2 Channelization of a low-water channel is not proposed under the proposed action. However, natural degradation of the cleared corridor is anticipated during future flood flows. Under any circumstances, the riffle/pool habitat now characteristic of the project area will continue to persist.

Mr. Ron McKinstry
Page 2

- 4) Page 125 and 126: Mitigation measures for PLO 1015 lands located between Watson Road and Powers Butte include limiting the clearing of vegetation to strips approximately 100 feet wide. In the cleared area between 91st Avenue and 123rd Avenue, the Flood Control District cooperated with the Arizona Game and Fish and Fish and Wildlife Service by selectively avoiding certain beneficial thickets of cottonwoods and willows. Rather than limiting the clearing to 100 foot wide strips and reducing the hydraulic benefits of clearing, selective preservation of beneficial thickets is recommended. As in the past, the Flood Control District will work closely with the Arizona Game and Fish, and Fish and Wildlife Service to designate the thickets to be preserved. In locations where the preserved vegetation will greatly reduce the cross sectional area available to flows, the clearing alignment could be widened beyond 1,000 feet.

Should you have any questions concerning our comments of the clearing project, please feel free to contact Dick Perreault at 262-1501.

Sincerely,

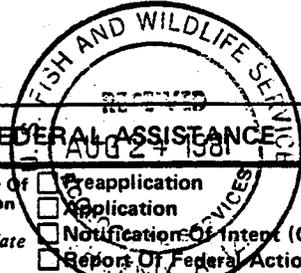


W. D. Mathews, P. E.

Copy to: Mr. Gary Hunt, Benham, Blair and Affiliates

Responses to comments in Letter 10.

- 10-1 Page 7 of the DEIS has been revised.
- 10-2 In Table 3.2-3 of the DEIS, the peak wind speed for the month of October 1978 was incorrectly reported as 94 mph; it should have been reported as 54 mph. This correction has been made in the DEIS.
- 10-3 The references to Tuthill Road Bridge in Table 3.12-1, page 74, and pages 75, 112, and 113 in the DEIS have been revised.



| | | | | | | | |
|---|------------------|---|-------------------|---|--|---|--|
| FEDERAL ASSISTANCE | | 2. Applicant's application | | 3. State application identifier | | Number | |
| 1. Type of Action (Mark appropriate box) <input type="checkbox"/> Preapplication <input type="checkbox"/> Application <input type="checkbox"/> Notification of Intent (Opt.) <input type="checkbox"/> Report of Federal Action | | a. Number | | b. Date 19 <u>1981</u> Year Month Day | | Assigned 19 <u>81</u> <u>07</u> <u>01</u> Year month day | |
| | | Leave Blank AUG 21 1981 | | <i>Palo Liza Leyba</i> | | | |
| 4. Legal Applicant/Recipient | | | | 5. Federal Employer Identification No. | | | |
| a. Applicant Name : Fish And Wildlife Service b. Organization Unit : Ecological Services c. Street/P.O. Box : 2934 West Fairmount Avenue d. City : Phoenix e. County : Maricopa f. State : Arizona g. Zip Code : 85017 h. Contact Person : Ron McKinstry, Wildlife Biologist (Name & telephone no.) (602) 241-2493 | | | | 6. Program (From Federal Catalog) a. Number <u>150999</u> b. Title <u>Unknown</u> DOI, U S. Fish & Wildlife Svc | | | |
| 7. Title and description of applicant's project Clearing of Phreatophytic Vegetation From the Salt and Gila Rivers Ninety First Avenue to Gillespie Dam-Maricopa County, Arizona-Draft Environmental Impact Statement | | | | 8. Type of applicant/recipient A-State G-Special Purpose District B-Interstate H-Community Action Agency C-Substate District I-Higher Educational Institution D-County J-Indian Tribe E-City K-Other F-School District (Specify): <u>Federal Agency</u> Enter appropriate letter <input checked="" type="checkbox"/> | | | |
| This EIS assesses the Environmental consequences of issuing a Certificate of Compatibility for the clearing of a 1,000ft wide corridor of vegetation from the Salt & Gila Rvs between 91st Ave. to Gillespie Dam. Alternatives assessed are: an alternative 1,000ft. wide clearing recommended by the US Fish & Wildlife Svc. & a 2,000 ft wide (over | | | | 9. Type of assistance A-Basic Grant D-Insurance B-Supplemental Grant E-Other C-Loan Enter appropriate letter(s) <input type="checkbox"/> <input checked="" type="checkbox"/> | | | |
| 10. Area of project impact (Names of cities, counties, states, etc.) Maricopa County, Arizona | | 11. Estimated number of persons benefiting | | 12. Type of application A-New C-Revision E-Augmentation B-Renewal D-Continuation Enter appropriate letter <input type="checkbox"/> <input checked="" type="checkbox"/> | | | |
| 13. Proposed Funding | | 14. Congressional Districts Of: | | 15. Type of change For 12c or 12e A-Increase Dollars F-Other Specify: B-Decrease Dollars C-Increase Duration D-Decrease Duration E-Cancellation Enter appropriate letter(s) <input type="checkbox"/> <input type="checkbox"/> | | | |
| a. Federal \$.00 | b. Applicant .00 | a. Applicant mul. | b. Project mul. | | | | |
| c. State .00 | d. Local .00 | e. Other 1 .00 | f. Total \$ 1 .00 | 16. Project Start Date 19 <u>19</u> Year month day | | 17. Project Duration Months | |
| | | 18. Estimated date to be submitted to federal agency 19 | | 19. Existing federal identification number | | | |
| 20. Federal agency to receive request (Name, city, state, zip code) | | | | 21. Remarks added <input type="checkbox"/> Yes <input type="checkbox"/> No | | | |
| 22. The Applicant Certifies That | | a. To the best of my knowledge and belief, data in this preapplication/application are true and correct, the document has been duly authorized by the governing body of the applicant and the applicant will comply with the attached assurances if the assistance is approved. | | b. If required by OMB Circular A-95 this application was submitted, pursuant to instructions therein, to appropriate clearinghouses and all responses are attached: (1) Arizona State Clearinghouse <input type="checkbox"/> <input checked="" type="checkbox"/> (2) Region I Clearinghouse (MAG) <input type="checkbox"/> <input checked="" type="checkbox"/> (3) <input type="checkbox"/> <input type="checkbox"/> | | | |
| 23. Certifying representative | | a. Typed name and title | | b. Signature | | c. Date signed Year month day 19 | |
| 24. Agency name | | 25. Application received 19 | | 26. Organizational Unit | | 27. Administrative office | |
| 28. Federal application identification | | 29. Address | | 30. Federal grant identification | | 31. Action taken | |
| <input type="checkbox"/> a. Awarded <input type="checkbox"/> b. Rejected <input type="checkbox"/> c. Returned for amendment <input type="checkbox"/> d. Deferred <input type="checkbox"/> e. Withdrawn | | 32. Funding | | 33. Action date 19 | | 34. Starting date 19 | |
| | | a. Federal \$.00 b. Applicant .00 c. State .00 d. Local .00 e. Other .00 f. Total \$.00 | | 35. Contact for additional information (Name and telephone number) | | 36. Ending date 19 | |
| 37. Remarks added <input type="checkbox"/> Yes <input type="checkbox"/> No | | 38. Federal agency A-95 action | | a. In taking above action, any comments received from clearinghouses were considered. If agency response is due under provisions of Part 1, OMB Circular A-95, it has been or is being made. | | | |
| | | b. Federal Agency A-95 Official (Name and telephone number) | | | | | |

Section I - Applicant / Recipient Data

Section II - Certification

Section III - Federal Agency Action

TO:

12

State Application Identifier (SAI)

JUL 1 1981

State AZ No. 81-80-0035

Mr. Terry B. Johnson
Arizona Natural Heritage Program
30 North Tucson Boulevard
Tucson, Arizona 85716

Game & Fish Region I
Transportation
Ag. & Hort.
Az. Natural Heritage Prog
Health
Water
AORCC
Land

FROM: Arizona State Clearinghouse
1700 West Washington Street, Room 505
Phoenix, Arizona 85007

OEPAD-P. Bergthold

This project is referred to you for review and comment. Please evaluate as to the following questions. After completion, return THIS FORM AND ONE XEROX COPY to the Clearinghouse no later than 17 WORKING DAYS from the date noted above. Please contact the Clearinghouse at 255-5004 if you need further information or additional time for review.

No comment on this project Proposal is supported as written Comments as indicated below

1. Is project consistent with your agency goals and objectives? Yes No Not Relative to this agency

2. Does project contribute to statewide and/or areawide goals and objectives of which you are familiar? Yes No

3. Is there overlap or duplication with other state agency or local responsibilities and/or goals and objectives? Yes No

4. Will project have an adverse effect on existing programs with your agency or within project impact area? Yes No

5. Does project violate any rules or regulations of your agency? Yes No

6. Does project adequately address the intended effects on target population? Yes No

7. Is project in accord with existing applicable laws, rules or regulations with which you are familiar? Yes No

Additional Comments (Use back of sheet, if necessary):

Reviewers Signature Terry B Johnson

Date July 2, 1981

Title Coordinator / ANHP

Telephone 323-1867

TO:

Art Auerbach, Supervisor
Socio Economic Analysis Section
Dept. of Transportation
206 So. 17th Ave., Rm. 310 B
Phoenix, AZ 85007

13

State Application Identifier (SAI)
JUN 1 1981 State AZ No 81-80-0035

Game & Fish Region I
Transportation
Ag. & Hort.
Az. Natural Heritage Prog
Health
Water
AORCC
Land

FROM: Arizona State Clearinghouse
1700 West Washington Street, Room 505
Phoenix, Arizona 85007

OEPAD-P. Bergthold

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RECEIVED
JUN 30 1981
SOCIO. ANALYSIS

No comment on this project Proposal is supported as written Comments as indicated below

- 1. Is project consistent with your agency goals and objectives? Yes No Not Relative to this agency
- 2. Does project contribute to statewide and/or areawide goals and objectives of which you are familiar? Yes No
- 3. Is there overlap or duplication with other state agency or local responsibilities and/or goals and objectives? Yes No
- 4. Will project have an adverse effect on existing programs with your agency or within project impact area? Yes No
- 5. Does project violate any rules or regulations of your agency? Yes No
- 6. Does project adequately address the intended effects on target population? Yes No
- 7. Is project in accord with existing applicable laws, rules or regulations with which you are familiar? Yes No

Additional Comments (Use back of sheet, if necessary):

Reviewers Signature Paul Hlooy
Title State Planner

Date 7-15-81
Telephone 261-7251

TPC - S... K

State Application Identifier (SAI)

TO:

7/24

14

JUL 1 1981

State AZ No

81-80-0035

John J. DeBoiske, Exec. Dir.
Maricopa Association of
Government
1820 W. Washington St.
Phoenix, AZ 85007 0633

Game & Fish Region I
Transportation
Ag. & Hort.
Az. Natural Heritage Prog
Health
Water
AORCC
Land

FROM: Arizona State Clearinghouse
1700 West Washington Street, Room 505
Phoenix, Arizona 85007

OEPAD-P. Bergthold

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2. Does project contribute to statewide and/or areawide goals and objectives of which you are familiar? Yes No
3. Is there overlap or duplication with other state agency or local responsibilities and/or goals and objectives? Yes No
4. Will project have an adverse effect on existing programs with your agency or within project impact area? Yes No
5. Does project violate any rules or regulations of your agency? Yes No
6. Does project adequately address the intended effects on target population? Yes No
7. Is project in accord with existing applicable laws, rules or regulations with which you are familiar? Yes No

Additional Comments (Use back of sheet, if necessary):

Reviewers Signature Jack Tevlin

Date 7/24/81

Title Staff Assistant

Telephone _____



15

MARICOPA ASSOCIATION OF GOVERNMENTS

1820 WEST WASHINGTON PHOENIX, ARIZONA 85007 (602) 254-6308

July 1, 1981

RECEIVED

TO: Mr. Terry Johnson, MAGTPO
FROM: Clearinghouse Contact: Nanette Grott
SUBJECT: PROJECT NOTIFICATION AND REVIEW

JUL 2 1981

MAGTPO

Applicant: Fish and Wildlife Service

Project Title: CLEARING OF PHREATOPHYTIC VEGETATION FROM
FROM THE SALT AND GILA RIVERS
State Application Identifier: 81-80-0035

MAG Log Number: 0633

Date Due: July 24, 1981

A copy of an A-95 application form AZ-189 along with supporting project documentation is attached for your review and comment in accordance with requirements of OMB Circular A-95. Please review the proposal as it affects the plans and programs of your agency and register your response below. Please return ONLY THIS completed form by the date noted above.

- No comment on the above project Proposal is supported as written Comments as indicated below
1. Is project consistent with your agency goals and objectives? Yes No Not Relative to this agency
 2. Does project contribute to statewide and/or areawide goals and objectives of which you are familiar? Yes No
 3. Is there overlap or duplication with other state agency or local responsibilities and/or goals and objectives? Yes No
 4. Will project have an adverse affect on existing programs with your agency or within project impact area Yes No
 5. Does project violate any rules or regulations of your agency? Yes No
 6. Does project adequately address the intended efforts on target population? Yes No
 7. Is project in accord with existing applicable laws rules or regulations with which your are familiar? Yes No

Additional Comments (Use back of sheet, if necessary)

Reviewers Signature James T. Reynolds

Date 7/9/81

A Voluntary Association of Local Governments in Maricopa County

TO:

State Application Identifier (SAI)

16

State AZ No.

81-00-0035

Department of Water Resources
Mr. Larry Linser
99 E. Virginia
Phoenix, AZ 85004

Game & Fish Region I
Transportation
Ag. & Hort.
Az. Natural Heritage Prog
Health
Water
AORCC
Land

FROM: Arizona State Clearinghouse
1700 West Washington Street, Room 505
Phoenix, Arizona 85007

OEPAD-P. Bergthold

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No comment on this project Proposal is supported as written Comments as indicated below

1. Is project consistent with your agency goals and objectives? Yes No Not Relative to this agency
2. Does project contribute to statewide and/or areawide goals and objectives of which you are familiar? Yes No
3. Is there overlap or duplication with other state agency or local responsibilities and/or goals and objectives? Yes No
4. Will project have an adverse effect on existing programs with your agency or within project impact area? Yes No
5. Does project violate any rules or regulations of your agency? Yes No
6. Does project adequately address the intended effects on target population? Yes No
Unknown
7. Is project in accord with existing applicable laws, rules or regulations with which you are familiar? Yes No

Additional Comments (Use back of sheet, if necessary):

Reviewers Signature Robert L. Ward
Title Chief, Flood Control Branch

Date 7/28/81
Telephone 255-1566

TO:

17

State Application Identifier (SAI)

JUN 11 1981

State AZ No.

81-80-0035

Dr. James Sam, M.D., Director
Department of Health Services
1740 West Adams Street
Phoenix, AZ 85007

Game & Fish Region I
Transportation
Ag. & Hort.
Az. Natural Heritage Prog
Health
Water
AORCC
Land

FROM: Arizona State Clearinghouse
1700 West Washington Street, Room 505
Phoenix, Arizona 85007

OEPAD-P. Bergthold

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2. Does project contribute to statewide and/or areawide goals and objectives of which you are familiar? Yes No

3. Is there overlap or duplication with other state agency or local responsibilities and/or goals and objectives? Yes No

4. Will project have an adverse effect on existing programs with your agency or within project impact area? Yes No

5. Does project violate any rules or regulations of your agency? Yes No

6. Does project adequately address the intended effects on target population? Yes No

7. Is project in accord with existing applicable laws, rules or regulations with which you are familiar? Yes No

Additional Comments (Use back of sheet, if necessary):

Reviewers Signature _____

Date _____

Title _____

Telephone _____

TO:

Mr. James R. Carter, Director
Agriculture & Horticulture Dep
421 Capitol Annex West
Phoenix, Arizona 85007

FROM: Arizona State Clearinghouse
1700 West Washington Street, Room 505
Phoenix, Arizona 85007

State Application Identifier (SAI)

18

JUN 1 1981

State AZ No

81-80-0035

Game & Fish Region I
Transportation
Ag. & Hort.
Az. Natural Heritage Prog
Health
Water
AORCC
Land

OEPAD-P. Bergthold

RECEIVED

JUN 1 1981

ARIZONA COMMISSION OF
AGRICULTURE & HORTICULTURE

This project is referred to you for review and comment. Please evaluate as to the following questions. After completion, return THIS FORM AND ONE XEROX COPY to the Clearinghouse no later than 17 WORKING DAYS from the date noted above. Please contact the Clearinghouse at 255-5004 if you need further information or additional time for review.

No comment on this project Proposal is supported as written Comments as indicated below

1. Is project consistent with your agency goals and objectives? Yes No Not Relative to this agency
2. Does project contribute to statewide and/or areawide goals and objectives of which you are familiar? Yes No
3. Is there overlap or duplication with other state agency or local responsibilities and/or goals and objectives? Yes No
4. Will project have an adverse effect on existing programs with your agency or within project impact area? Yes No
5. Does project violate any rules or regulations of your agency? Yes No
6. Does project adequately address the intended effects on target population? Yes No
7. Is project in accord with existing applicable laws, rules or regulations with which you are familiar? Yes No

Additional Comments (Use back of sheet, if necessary):

ATTACHED SHEET.

Reviewers Signature

D. Countryman

Title

State Reviewer Compliance

Date

7-7-81

Telephone

255-4373



19

Arizona Commission of
Agriculture and Horticulture

1688 WEST ADAMS • PHOENIX, ARIZONA 85007 • (602) 255-4373



July 8, 1981

Arizona State Clearinghouse
1700 West Washington Street, Room 505
Phoenix, AZ 85007

State AZ. No. 81-80-0035

The Native Plant Law (ARS-3901-8) requires the clearer of land to notify the Commission of Agriculture and Horticulture 30 days on private and federal lands and 60 days on state lands before destruction of protected native plants takes place. This is in order to effect the salvaging of these plants. In the above referenced project, there are a number of cacti and mesquite trees in the project area. The mesquite trees would be salvaged as wood, and the cacti removed to other sites for use by tax supported institutions for landscaping purposes.

R.A. Countryman
Director, Division of Compliance

RAC/dc

Mr. Ron McKinstry
Fish & Wildlife Services
September 10, 1981
Page - 2 -

2. We concur with the Alternative 1 (Fish and Wildlife Service) alignment through Sections 34 & 35; T-1N; R-1W as more nearly matching the river's recent tendency. To the extent possible, the clear channel should simply be maintenance of the channel "favored" by the river. This is not only good wildlife policy, it is good hydraulics.

We will be happy to discuss our conclusions & recommendations in more detail if you should want further information. Please contact me at 279-3541 or contact Mr. Bill Jolly our water resources Consulting Engineer at 892-6745, if we can be of further assistance.

Sincerely yours,

ROYDEN ENGINEERING CO.



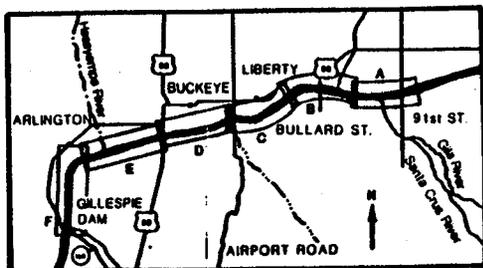
R. M. Moseke

RMM:mmmm

CC: Maricopa County - Phil Epstein



*Proposed
realignment*



Legend

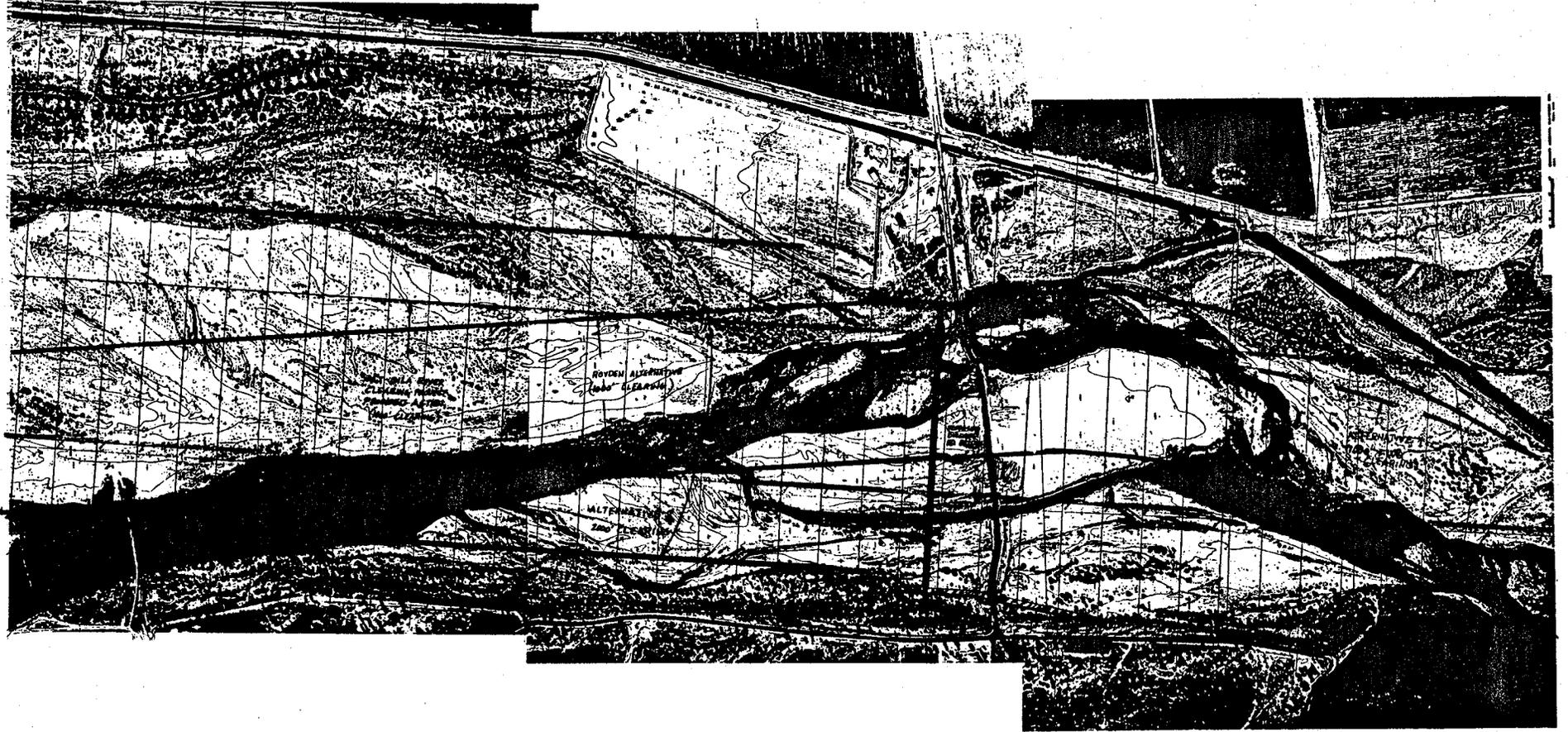
- Proposed action (1,000-foot clearing) —————
- Alternative 1 (1,000-foot FWS clearing) - - - - -
- Alternative 2 (2,000-foot clearing) ······

Source: Arizona Department of Transportation 1980.



PLATE B

**Salt-Gila River
Clearing Project**





4619 EAST ARCADIA LANE • PHOENIX, ARIZONA 85018

September 15, 1981

Ron McKinstry
U.S. Fish and Wildlife Service- Ecological Services
2934 W. Fairmount Ave.
Phoenix, AZ 85017



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Dear Mr. McKinstry:

This chapter of the National Audubon Society wishes to congratulate the USFWS for an effective and useful DEIS on the 91st to Gillespie vegetation clearing project. It is a credit to your office and agency and a benefit to an ecologically diverse and socially complex area. It is a real satisfaction to the 1500 Audubon members residing here in Maricopa County that this document has been so carefully compiled.

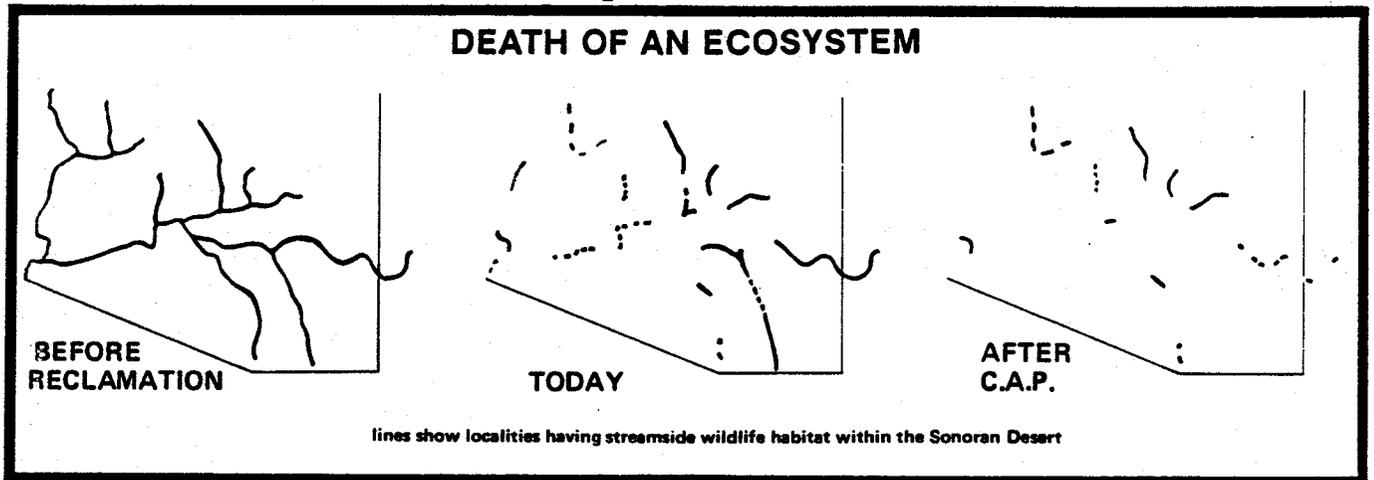
We would also like to congratulate to the Arizona Game and Fish Department, the County Flood Control District, the Phoenix District of the Bureau of Land Management, the impacted residents of this area, and the many other agencies and individuals who provided valuable input in order that the issues at stake could be better delineated.

Before submitting a a page by page commentary, some general comments on the significance of this area should be pointed out.

The attached map titled "DEATH OF AN ECOSYSTEM" places in perspective the attrition of Sonoran Desert riparian habitats from a century of damming, diversion, channelization, and groundwater pumping. As a result one finds much of the Sonoran Desert riparian areas with their cottonwood, willow and mesquite stands and their associated water holes, and marshy areas have been already largely eradicated or degraded. Whether any or all of the four Congressionally authorized CAP dams will be erected is not known, but the final map on the right does show how extremely valuable the few remaining riparian areas would become in that event.

It is one of the blessings of modern society situated in the desert that sewage effluent is being continuously produced and that that effluent can partially replace some of the lost riparian habitat-- as for example, on the Santa Cruz as a result of metropolitan Tucson, and on this stretch of the Salt-Gila as a result of metropolitan Phoenix. A circle has been drawn around these two areas on this map.

DEDICATED TO THE PROTECTION OF NATURAL WETLANDS IN AN ARID ENVIRONMENT



Though the map highlights the scarcity of these areas, it should be pointed out that because of their proximity to urban areas they provide a living classroom of the riparian floodplain and the associated plant and animal communities therein.

Page ix, para. 2: It is a source of pride, satisfaction and delight to members of this society that the area downstream from 91st Ave. has supported Yuma Clapper Rails. This endangered species is known to breed only in a few areas away from the Lower Colorado in Arizona viz. Picacho Reservoir, Tacna and at the Coon Bluff Marsh and the marsh below Granite Reef. Though the cattails in the EIS area are incipient now, there is no question but that in a few years there will be enough to support the species again. These easily accessible marsh habitats are an educational and recreational treasure-trove for the nearby urban wildlife observers.

These may well be remnant populations of earlier times when backwater areas and marshy swales on various points of the Gila provided suitable habitat for this species. Not all cattail marshes are washed out even in the worst floods as the post-1978 and 1980 cattail stands at Coon's Bluff would indicate.

21-1 Page xi, paragraph 1: 3 percent discount rate may be what DWR uses but it is an unrealistic figure used to justify the benefit cost ratio of capital-intensive water project expenditures. Who these days can borrow money at 3%? Certainly not our county, state, or federal governments?

21-2 Page 3, Table 1.2-1: If the flows from 1965 and on were measured at 48th St., where were the preceding flows measured and would they be comparable or would "rout-down" lessen them by some amount to compare with 48th St?

Page 12, paragraph 3: A cross-sectional drawing would make this clearer to those reading the EIS.

- 21-3 Page 13, paragraph 3: The Maricopa County Flood Control District was quoted in the Arizona Republic, Sept. 1981, as having a plan for Holly Acres levees which cost \$1.3 million. That plan should be interfaced and referred in the EIS as it is relevant to this clearing proposal.
- 21-4 Page 31, Table 3.6-2: Why were the March and December 1978 floods some 30,000 cfs lower at 48th Street than at Granite Reef? And why, on the other hand, was the Valentine's Day, 1980 flood greater by 10,000 cfs upstream? Again, there is variance in the 1966 data, What would the peak flows at Holly Acres and downstream? This question is relevant to this EIS because it is important in knowing what the rout-down or increase will be at Holly Acres. Also, it is important in order to compare CAWCS 48th St target figures with this EIS study area's anticipated flows.
- 21-5 Page 34, paragraph 2: Does the Arizona Beagle Club or the Wildlife Preservation Society (Sam Kellsall, Esq. et. al.) have an entitlement to some Gila stream flow? At one time they did-- a few years ago.
- 21-6 Page 36, Table 3.6-4: This table would indicate that new riparian habitat will be developed below the Buckeye heading once BID ties in with PVNGS. Will the Buckeye weir be breached? What a salutary effect this would have upon the beleaguered Sonoran Desert riparian ecosystem. This impact should be considered in the discussion of mitigation for this project. The wildlife respecting public of this area will truly be delighted when surplus flows will no longer be diverted by BID. Taxpaying urbanites would greatly enjoy these wildlife or recreational benefits from their water rather than giving it away free.

Page 50, paragraph 4: The undersigned nostalgically remembers tape recording Clapper rails at "Flushing Meadows" east of 107th Ave. in the early '70's. AZ G&F also photographed them in this area. There is no reason why this sort of habitat will not return in a few years when cattail or bulrush habitat improves.

- 21-7 Page 70, para. 2: Where are the "citrus orchards" which have been

flooded in the project area?

- 21-8 Page 71, para 2: This paragraph mentions how many dairies are in the area. What were the average damages per dairy and where were they located? Also, there should be mention of how many farmer-entrepreneurs were flooded-- as was given for dairy operators-- and to what extent each farmer was flooded (in acres).

Page 86, 87, 88, Tables: Both the depth and flow reductions of the 50,000, 200,000 and 320,000 cfs floods in the Holly Acres reach are practically identical for the no action plan as for the 2000 ft clearing. This illustrates that flood control projects such as this one have a difficult time making economic sense. They are a political solution at the expense of those not situated in a floodplain to assist those who are. This chapter is optimistic that in this case, the mitigation aspects of this project will compensate for these losses. The excellent cooperation and understanding of the MCFCD, FWS, G&F, BLM and the impacted residents should make this project a credit to this community.

Page 89, para. 2: As shall be seen later in the economics section, Alternative 1 in this study is by far the preferable plan of action. This report bears out the point that it has a better b/c ratio, has less environmental impacts, and lastly, has the same flow-reduction capabilities as the non-FWS 1000 ft. clearing.

- 21-9 Page 93, last paragraph: The beneficial effects of floods in depositing alluvial beds, disseminating seeds, providing dissolved nutrients and in elevating the water table should be mentioned in the EIS. Scouring also accelerates groundwater recharge by removing impervious algae and debris which slows infiltration rates. Scouring and removal of vegetation should be considered an important, beneficial part of the natural cycle. New interfaces of deciduous hardwoods will develop with each new meander developed. Stabilization of the floodway may have flood control benefits for human development which has occurred in the floodplain but it definitely diminishes the diversity and quality of the riparian ecosystem. These important natural dynamics of the floodplain are missing from this draft and should be added.

21-10 Page 95, para. 1: Are these HEC-2 50, 100 and 500 yr. flood events with their flows of 50,000, 200,000 and 320,000 cfs measured at the confluence, 48th Street, 115th Avenue or where? Would these figures be the same for all locations? This report should focus on flows in the EIS area when possible.

21-11 Page 111, Table: Rather than listing only total acres of cultivated land, list how many farm families would receive how many average acres. Dairies and feedlots were listed per business enterprise, not per acre. Show by a map and table each farm flooded, where, and how many acres per farm owner. This would give a better idea of the effective placement of the cleared area, the possible effectiveness of the plan and the locality where there are the greatest and fewest beneficiaries.

21-12 Page 116, para. 2: It would be relevant to this EIS to know the amount of dollars spent by federal emergency loans or SCS in restoring flooded farmlands. What were the payments per farm family? What segments or reaches were most involved?

Page 121, para. 3: The b/c ratio for alternative 1 evidences the clear superiority of this plan. This chapter endorses it for it's a plan which is both economically and environmentally superior.

Page 124, Base and Meridian Tract: This area historically had a superb wildlife impoundment. Nesting marsh birds, Cinnamon Teal and Blue-winged Teal were in abundance. It was also surrounded by large cottonwood and willow trees adding diversity to the cattail edges. Mitigation should include about two-acre-sized ponding areas here at "B&M" as have been included in other reaches.

Page 124, Amator Tract: This area should also include ponding areas as well as the segment from 91st Ave. to Bullard Rd. These are the areas with the most ecological diversity perhaps because of the low salt content effluent. Deciduous hardwoods are known to grow well in this area historically and they greatly compliment the cattail-bulrush habitat.

Thank you for this opportunity to respond to the DEIS. If we may be of further assistance in any way please let us know.

Sincerely,

Robert A. Witzeman
Robert A. Witzeman, M.D.

Responses to comments in Letter 21.

- 21-1 See response to Comment 4-11.
- 21-2 The flood peaks quoted for historical floods that occurred between, and including, 1891 and 1940 are based on estimated floods along the Salt and Gila rivers between downstream of the confluence with the Verde River and downstream at the Painted Rock Dam site. These flood peaks are not directly comparable to the flows that have been measured since 1965 at Forty-eighth Street. The historical flood flows are presented only as background information.
- 21-3 The Holly Acres Plan is not part of the proposed action and has not been approved or funded as of October 1981. The plan proposed for Holly Acres is to construct diversion levees parallel to the north bank of the Gila River from One hundred-thirteenth Avenue to One hundred-nineteenth Avenue. The objective of the levees would be to divert low flows away from the north bank.
- 21-4 The peak flows previously reported in the DEIS for Granite Reef Diversion Dam and Forty-eighth Street are not comparable. Page 30 and Table 3.6-2 of the DEIS have been revised to remove reference to these comparisons. Based on information reported in Tables 4.3-1, 4.3-2, and 4.3-3 of the DEIS, the clearing projects would have minimal impact on flooding in the Holly Acres-El Mirage Road area.
- 21-5 According to records of the Arizona Water Resources Department, neither the Arizona Beagle Club nor the Wildlife Preservation Society has entitlement to Gila River waters.
- 21-6 The quantity of excess water released below the Buckeye weir should not change significantly once the Buckeye Irrigation District begins receiving their full-water allotment from the

PVNGS pipeline. No plans have been identified for breaching the Buckeye weir.

- 21-7 Page 70 makes no mention of citrus orchards having been flooded. Croplands damaged by recent floods included cotton, grain crops, and alfalfa.
- 21-8 Flood damage estimates for the various types of real estate improvements due to the 50, 100, and 500-year flood events are presented in Table 4.11-3.
- 21-9 The objective of the proposed clearing alternatives is to reduce the total damages due to flooding by increasing the total cross-sectional area of the stream channel. As shown in Tables 4.3-1, 4.3-2, and 4.3-3, neither of the clearing actions will significantly reduce flooding.
- 21-10 The HEC-2 computer data are based on the assumption that for each flood event, the flow is constant at all points along the project area.
- 21-11 The total number of farmsteads, acres of cultivated land, and dairies and feedlots estimated to suffer flood damage during floods of 50,000, 100,000, and 200,000 cfs can be calculated using data presented in Tables 4.11-2 and 4.11-3. The data presented in Table 4.11-3 are derived from HEC-2 computer model calculations based on a 1976 data base regarding cross-sectional dimensions, percent of vegetative cover, etc. The data presented in Table 4.9-2, therefore, are estimates. Speculating on future damages that would be incurred by each farmer is outside the scope of this report. Flood damages by river section resulting from the February 1980 flood are reported in a report published by the U.S. Army Corps of Engineers, Los Angeles District, entitled Phoenix Flood Damage Survey February 1980.
- 21-12 The requested information can be found in the publication cited in the response for Comment 21-11.

5.3 MODIFICATIONS AND CORRECTIONS TO THE DEIS

5.3.1 ERRATA

The following changes in the DEIS are of an editorial nature and are relatively minor. Consequently, the affected pages have not been reprinted in full. These changes are to be incorporated into the DEIS. References to paragraph 1, etc., indicate the first full paragraph on a page. If no paragraph is cited, the lines containing the change will be found in the first partial paragraph on the page.

Page 7, lines 1-3. Delete reference to additional clearing: rivers between Ninety-first Avenue and One hundred twenty-third Avenue

Page 8, paragraph 2, lines 4-6. Delete reference to long-term alternative flood control measures: problems and is considering both regulatory storage and flood control measures

Page 12, paragraph 3. Add the following sentence at the end of this paragraph: The placement of fill within the Salt and Gila rivers will be subject to the Section 404 permit process.

Page 13, paragraph 2, lines 4-5. Delete lines 4-5: Levees are being considered as long-term solution alternatives for the study area as part of the Central Arizona Water Control Study (CAWCS).

Page 21, Table 3.2-3. Change peak gust speed for October from 94 to 54.

Page 31, Table 3.6-2. Delete column titled Historic Flows Measured at Forty-eighth Street.

Page 31, Table 3.6-2. Revise sources to: Source: Salt River Project 1962-80.

Page 42, paragraph 1, line 6. Add (Prosopis velutina) following the word "mesquite": mesquite (Prosopis velutina).

Page 42, paragraph 1, line 7. Add (Tessaria sericea) following the word "arrowweed": arrowweed (Tessaria sericea).

Page 42, paragraph 2, line 3. Delete (Prosopis juliflora var. velutina).

Page 43, Table 3.7-1. Change Prosopis juliflora var. velutina to Prosopis velutina.

Page 43, Table 3.7-1. Change Larrea tridentata to Larrea divaricata spp. tridentata.

Page 74, Table 3.12-1. Change the present design capacity for Tuthill Road to 200,000.

Page 75, paragraph 4, lines 2-4. Reword sentences: Two new bridges, at Bullard and Tuthill roads, have been designed for a 200,000-cfs flood capacity. The Tuthill Bridge, completed in May 1981, replaced the crossings at Jackrabbit Trail and Airport Road.

Page 84, paragraph 3, line 6. Add this sentence following the sentence ending with the word "river": The surface water quality standard for turbidity, i.e., 50 JTU, would be exceeded temporarily.

Page 92, paragraph 2, line 2. Change fine sediment to gravelly and sandy loam.

Page 95, line 14. Add (Jackson 1981). at the end of the paragraph.

Page 112, paragraph 1, lines 1-3. Reword sentence: The removal of vegetation from the river channel upstream of the bridges at Arizona Highway 85 and Tuthill Road and the proposed bridge at Bullard Avenue would increase the frequency of flooding of the approaches to these

Page 113, paragraph 1, line 5. Reword sentence: The new bridges completed at Tuthill Road and proposed at Bullard

Page 114, paragraph 2, lines 6-9. Delete sentence: It is assumed ... corridor.

References Cited, page 139. In U.S. Fish and Wildlife Service, 1980: change the page number from 33765 to 33767.

5.3.2 TEXT REVISIONS

Extensive changes to pages in the text of the DEIS are included in the following pages. The original DEIS page number is enclosed in parenthesis following the FEIS page number.

Large amounts of water cannot be released until the water level reaches the spillway gates at the top of the dam. At that point the amount of downstream releases is governed by the height of the water above the spillway crest. Outlets at the bottom of the dam are small, sized to release water at a rate sufficient to meet water demands of downstream users.

Recent flow data for the lower Salt River as gauged at the Granite Reef diversion dam illustrate the volume and duration of flooding in the study area (Table 3.6-2). Although flooding occurs at lower flows, the portions of the Salt and Gila rivers in the project area can carry flows up to 50,000 cfs without significant flood damages (Gross 1981). Major floods occur during the winter months when precipitation within the drainage basin is typically widespread. Widespread flooding in the lower reaches is usually the result of rapid melting of the accumulated snowpack in the higher elevations by either unseasonably warm conditions, or more often, rainfall melting the snowpack (EPA 1979a).

3.6.1.1.2 Flows Within the Study Area

Ninety-first Avenue, the upstream boundary of the study area, is located on the Salt River approximately 2 miles upstream from the confluence with the Gila River. Elevations within the study area range from 940 feet at Ninety-first Avenue to 740 feet at Gillespie Dam producing an average river gradient of 5.7 feet per mile.

There are several tributaries to the Gila River within the study area. These include the Agua Fria River, Waterman Wash, Hassayampa River, and Centennial Wash.

The alluvial material in the riverbed contributes to a highly movable channel, resulting in a braided effect characteristic of this type of river substrate.

Several studies provide descriptions of the Salt and Gila rivers from Ninety-first Avenue to Gillespie Dam (Halpenny and Greene 1975; Halpenny and Clark 1977; Management Research, Inc. 1978; U.S. Nuclear Regulatory Commission

(DEIS 30)

2000 minus the above commitments are given in Table 3.6-4. Effluent discharges to the Salt River are projected to be reduced as much as 75 percent by the year 2000.

The estimates are based on two assumptions:

- The Flushing Meadows allocation will not be claimed, and
- ANPP claims only 58 mgd (units 1, 2, and 3 at PVNGS) of their allotted 125 mgd.

Not shown in Table 3.6-4 are the conditions that would develop if the entire 125 mgd of effluent committed to ANPP were used. If this occurred, no effluent would be discharged to the river, with the exception of the commitment to the AGFD. With the reduction in effluent discharged from the Ninety-first Avenue plant, flow within this section of the river will be minimal except during periods of precipitation or when water is released from upstream impoundments.

River flow downstream of Buckeye Heading is not dependent on effluent discharge and should change only as affected by reduced irrigation tailwater discharges, or a decrease in the volume and frequency of floodwater flows.

3.6.1.2 Quality

The Gila River in the project area is classified according to Arizona state water quality standards as an effluent-dominated water with protected uses including partial body contact, agricultural irrigation, and agricultural livestock watering.

Base flows in the study area are of relatively poor quality originating from wastewater treatment plant discharges, irrigation return flow, tailwaters from irrigation canals, and urban runoff. Waters derived from effluent exhibit high biochemical oxygen demand (BOD), elevated levels of ammonia, and -- if disinfected -- chloramine toxicity. Waters originating from irrigation tailwaters are typically high in total dissolved solids (TDS) and total suspended solids and are alkaline (Camp Dresser and McKee, Inc., and Arthur Beard, Inc. 1980).

Data for samples collected from the Salt River 1½ miles downstream of Ninety-first Avenue are presented in Table 3.6-5. Nutrients such as phosphorus and nitrate and fecal coliforms are all high, typical of effluent-laden water. Surface water standards for fecal coliforms (1,000 units/100 mL) and dissolved oxygen (1 mg/L) are probably exceeded periodically.

Water quality data for the Gila River upstream of Gillespie Dam (Table 3.6-6) are more characteristic of irrigation wastewaters. Salinity, as measured by TDS, and sulfate and chloride concentrations were all high. Constituents whose concentrations equaled or exceeded the Arizona maximum contaminant levels or the secondary maximum contaminant levels (Table 3.6-7) on at least one date between 1974 and 1976 included sulfate, chloride, fluoride, TDS, nitrate, arsenic, cadmium, lead, mercury, and selenium.

3.6.2 GROUNDWATER

3.6.2.1 Quantity

The study area historically has been underlain by relatively shallow groundwater levels, compared to other parts of the Salt River Valley (Schmidt 1980). The relatively shallow water table is largely due to the subsurface geology, chemical quality of the groundwater, and the disposal of sewage and irrigation wastewaters. According to Schmidt (1980) groundwater levels beneath the western portion of the study area, west of Monument Hill, have been less than 5 feet since the mid-1960s. East of Monument Hill and to about Ninety-first Avenue, the water table has ranged from 10 to 20 feet beneath the river channel. Subsurface geologic characteristics of the western part favor groundwater levels near or at the channel elevation.

The primary sources of recharge of groundwater in the study area include:

- Seepage of flood flows in the floodplains of the Salt, Gila, Agua Fria, and Hassayampa rivers;
- Seepage of sewage effluent and irrigation tailwater from the channels of the Salt and Gila rivers; and
- Deep percolation of irrigation return flow.

3.7.6 ENDANGERED SPECIES

No endangered plant species have been reported to occur in Maricopa County (U.S. Fish and Wildlife Service 1980). However, two plant species on the Arizona Natural Heritage Program Special Plant List and the BLM Sensitive Species List have been documented near the area (Barker 1981). Disk water hyssop (Bacopa rotundifolia), an aquatic plant, has been collected along the Gila River between Phoenix and Maricopa. Roughseed spurge (Euphorbia trachysperma) has been collected south of Wintersburg. There are no reports of either species within the project area (Butterwick 1981).

3.8 WILDLIFE

3.8.1 BIRDS

Approximately 272 species of birds have been recorded from the Salt-Gila River floodplain between Ninety-first Avenue and Gillespie Dam (Terrill 1980; Dames and Moore 1979, 1980; and Haase 1973). Seventy-four species (27 percent) are known to breed in the study areas.

The total number of species associated in the various habitat types in the study area is shown in Table 3.8-1. The cottonwood-willow series exhibits the greatest species richness with 62 species observed or known to occur. Forty-five and 44 bird species have been observed or are known to occur in the aquatic and mesquite (Prosopis juliflora var. velutina) association habitats, respectively.

Bird densities for representative habitats in the Robbins Butte area have been compiled by Dames and Moore (1979) (Table 3.8-2). Highest densities, i.e., 137 birds per 100 acres, comprised predominantly of white-winged doves and red-winged blackbirds, were observed in the salt cedar (Tamarix chinensis) association. Densities of 61 and 99 birds per 100 acres were observed in the cottonwood-willow and Prosopis juliflora var. velutina associations.

The densities are based upon the Emlen technique (Emlen 1971) transect counts and direct counts. The mesquite (Prosopis juliflora var. velutina

(DEIS-46)

association) and salt cedar (Tamarix chinensis association) transects were both in areas near Robbins Butte, an area where both habitats were considered the finest representatives of their vegetative types in the study area in terms of height and density (Engle-Wilson 1980). Due to the height and densities of the vegetative structure, the bird densities

4.0 ENVIRONMENTAL CONSEQUENCES

4.1 INTRODUCTION

Chapter 4 describes and analyzes the probable environmental impacts of the proposed action and alternatives. The analysis gives special attention to environmental components protected by law and to other resources considered to be of importance to man and his environment. Chapter 4 also discusses mitigating measures that may reduce or eliminate any adverse environmental impacts and identifies adverse impacts that could be avoided should the proposed action or alternatives be implemented.

In addition, Chapter 4 discusses the relationship between the short-term use of man's environment and the maintenance and enhancement of the long-term productivity and identifies any irreversible or irretrievable commitments of resources involved in implementing the proposed action or its alternatives. The proposed action and alternatives are not expected to have any significant impacts on geology, topography, and climate.

4.2 AIR QUALITY

4.2.1 PROPOSED ACTION: 1,000-FOOT CLEARING

4.2.1.1 Clearing Phase

The proposed action would result in a temporary deterioration of air quality due to increases in airborne particulates and construction equipment exhaust emissions produced during the clearing and grading operations and from emissions produced by the open burning of the cleared debris.

The proposed action would require the clearing of approximately 1,510 acres of vegetation from One hundred twenty-third Avenue to Gillespie Dam based on the vegetative conditions of March 1980. Particulates would

(DEIS-81)

be produced during the clearing and grading operations. These operations would require disturbance of the ground surface resulting in conditions suitable for dust formation. However, because the soils within the river channel consist predominantly of gravelly and sandy loam, particulate emissions should be minimal and localized. Also, due to a predominance of larger particles a significant quantity of the particulates would be expected to fall out close to the activity, thus reducing the transport of total particulate matter. The potential annual windblown dust emissions associated with 1,510 acres of cleared area would be approximately 14,043 tons per year (Table 4.2-1). This estimate is high because much of the area would become covered with regenerative growth before the end of one year. Equipment used in the operations would probably be parked near the cleared channel when not in operation; therefore, reentrained dust caused by traffic on access roads would also be minimal.

Exhaust emissions from the equipment used in the clearing and grading operations would produce localized increases in air pollutants including carbon monoxide, exhaust hydrocarbons, nitrogen oxides, sulfur dioxides, and particulates (Environmental Protection Agency 1975); however, the quantities generated during the clearing operations would not be significant.

Emissions from the open burning of the cleared vegetation would cause localized increases in particulates, carbon monoxide, and organics (EPA 1978). A permit from the Maricopa County Health Department will be required for all open burning. According to the health department (Johnston 1980), burning would probably not be allowed during the winter due to the frequency of temperature inversions in the region during that season. However, adverse impacts due to emissions from the open burning should not be significant during other seasons due to the prevailing winds blowing emissions to the west away from the metropolitan Phoenix area (see section 3.2).

TABLE 4.2-1

Estimated Annual Windblown Dust Emissions
Associated with the Proposed Clearing Action

| | Proposed Action 1,000-ft Clearing | Alternative 1 1,000-ft FWS Clearing | Alternative 2 2,000-ft Clearing | Alternative 3 No Action |
|--|---|---|---------------------------------------|----------------------------|
| <u>Construction Phase</u> | | | | |
| Total area to be cleared subject to wind erosion (acres) (1980 conditions) | 1,510 | 990 | 3,280 | 0 |
| Total potential fugitive dust emissions (tons/year) ^a | 14,043 | 9,207 | 30,504 | 0 |
| <u>Maintenance Phase</u> | | | | |
| Total maximum area to be maintained clear of phreatophytic vegetation (acres) | 4,130 | 4,160 | 8,240 | 0 |
| Total potential fugitive dust emissions based on maximum area potentially subject to fugitive dust emissions (tons/year) | 38,409 | 38,688 | 76,632 | Unknown ^b |

Source: Herzing, Cuscino, and Hackney 1981.

^aBased on MRI equation for calculating wind erosion of exposed areas:

$$E = 1.7 \frac{\frac{e}{50} \frac{s}{15} \frac{f}{25}}{\left(\frac{P-E}{50}\right)^2}$$

where E = Emission factor (tons/acre/year).

e = Surface erodibility, estimated to be 86 tons/acre/year for sandy loam.

s = Silt content of aggregate or road surface material (%), estimated to be 26.

f = Percentage of time that wind speed exceeds 12 mph at 1 ft above the ground, estimated to be 6.

P-E = Thornthwaite's Precipitation-Evaporation Index, 18 for the project area.

^bFuture vegetative conditions in project area are unknown.

4.2.1.2 Operation Phase

Air quality would be degraded locally during the maintenance clearing operations scheduled at 2-year intervals. The maintenance operations may require the clearing of the total area within the 1,000-foot-wide corridor from Ninety-first Avenue to Gillespie Dam, a total of 4,130 acres.

The area requiring clearing would be dependent on the extent of vegetative regeneration, future groundwater conditions, and the occurrence of flooding. Assuming the total area consists of exposed sandy loam soils, the maximum potential annual windblown dust emissions would be approximately 38,409 tons per year. However, the total would be considerably less than this due to regenerative growth and large areas of gravel interspersed with soils throughout the area. Emissions from open burning would be lower per acre of cleared vegetation than produced during the initial clearing due to the younger age of the salt cedar stands.

4.2.2 ALTERNATIVE 1: 1,000-FOOT FISH AND WILDLIFE SERVICE (FWS) CLEARING

4.2.2.1 Clearing Phase

Under this alternative approximately 990 acres of vegetation would be cleared between One hundred twenty-third Avenue and Gillespie Dam based on vegetative conditions in March 1980. Quantities of airborne dust and emissions produced during the clearing and grading operations would be less than produced under the proposed action due to the smaller area requiring clearing. Maximum windblown dust emissions due to the clearing would be approximately 9,207 tons per year (Table 4.2-1). Emissions from open burning would be approximately 30 percent less than produced by the proposed action.

4.2.2.2 Operation Phase

Maintenance clearing operations would require the clearing of as much as 4,160 acres, the total area within the 1,000-foot-wide clearing recommended by the FWS. As with the proposed action, the extent of the maintenance clearing actions would be dependent on the area covered by vegetation in future years. Impacts due to airborne dust and emissions from equipment and open burning would be similar to those described under the proposed action. Maximum potential windblown dust emissions would total 38,688 tons per year. However, the actual total would be expected to be considerably

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less than this due to regenerative growth, areas covered by vegetation not requiring clearing, and gravel content of the surface soil.

4.2.3 ALTERNATIVE 2: 2,000-FOOT CLEARING

4.2.3.1 Clearing Phase

Implementation of this alternative would require the clearing of approximately 3,280 acres from Ninety-first Avenue to Gillespie Dam. This includes 3,073 acres from One hundred twenty-third Avenue to Gillespie Dam and 207 acres not previously cleared between Ninety-first and One hundred

twenty-third avenues. Quantities of airborne dust and emissions produced by the clearing operations and open burning of cleared debris would be substantially greater than produced under either the proposed action or alternative 1. Maximum windblown dust emissions would be approximately 30,504 tons per year.

4.2.3.2 Operation Phase

Under this alternative as many as 8,240 acres would require maintenance clearing at 2-year intervals. Quantities of air pollutants produced during the clearing operations and open burning of debris would be perhaps twice as great as produced under either the proposed action or alternative 1. Maximum windblown dust emissions would total approximately 76,632 tons per year.

4.2.4 ALTERNATIVE 3: NO ACTION

Under the no action alternative, alternative 3, air quality within the study area would not be affected.

4.3 HYDROLOGY

4.3.1 PROPOSED ACTION: 1,000-FOOT CLEARING

4.3.1.1 Clearing Phase

Under the proposed action, approximately 1,510 acres of ground surface would be disturbed during the initial clearing operation and as many as 4,130 acres would be disturbed during each maintenance clearing operation, increasing the potential for erosion. The addition of sediment to the waterway would temporarily degrade existing water quality by increasing the turbidity and total suspended solid levels in the river. The surface water quality standard for turbidity, i.e., 50 JTU, would be exceeded temporarily. Considering the sources of flow for the Salt and Gila rivers in the Phoenix area, potential contaminants may exist in the riverbed. Contaminating

sources include effluent from waste water treatment plants (metals, sludges, etc.) and irrigation return flows (pesticides). Erosion of sediments would allow the release of possible contaminants trapped in the soil.

Construction activities will necessitate the use of heavy equipment. Petroleum products will be stored, transferred, and utilized in the area; therefore, the potential for leakage and spills exists. Normal day-to-day operations should create only minimal problems, but local isolated spill events would cause water quality degradation. Groundwater contamination would not be significant.

4.3.1.2 Operation Phase

The removal of vegetation should have beneficial effects on the capacity of the river channel to convey floodwaters. Removal of the vegetation would result in a decrease in mean cross-sectional depth, a decrease in resistance to flow (roughness coefficient), and a corresponding increase in mean cross-sectional velocity (U.S. Geological Survey 1976b). The flow characteristics for three flood levels, i.e., 50,000, 200,000, and 320,000 cubic feet per second (cfs), for the various clearing alternatives are presented in Tables 4.3-1, 4.3-2, and 4.3-3. The data are based on calculations utilizing the HEC-2 computer program (Water Surface Profiles) prepared by the Corps of Engineers (COE) (1980b). Although the channel profile data used in the calculations were collected in 1976 and may not be totally representative of present conditions, relative comparisons between the two clearing widths and the no action alternative should be valid. The effects of obstructions to flow such as bridges, culverts, and other structures are considered in the computations.

Average depth showed a decrease with implementation of the proposed action, i.e., 1,000-foot channel. The increased capacity of the channel to convey flows would result in reduced groundwater recharge. In addition, the increased capacity of the river channel would transport waters downstream of Gillespie more rapidly than if the vegetation were present, resulting in larger peak flows between Gillespie Dam and Painted Rock Reservoir. However, according to the COE data (Gross 1981), additional impacts would not be significant.

The cleared channel also should be more susceptible to erosion, thus perhaps establishing the low-water channel in the cleared corridor. This

development would enhance drainage characteristics during normal low-flow periods, thus enhancing water quality by alleviating extended stagnation. The increased aeration capability of the flowing water would result in increasing dissolved oxygen concentrations and decreasing biochemical oxygen demand (BOD) and ammonia concentrations in effluent-laden low flows.

Removal of the vegetation would result in reduced evapotranspiration, thereby reducing the impact of the vegetation on groundwater level (USGS 1977). However, removal of the shade provided by vegetation would lead to higher water temperatures and lower dissolved oxygen. The surface water standard for dissolved oxygen (1 mg/L) would be exceeded periodically in the effluent-laden waters. Improved groundwater may result from the removal of vegetation as evapotranspiration has a concentrating action on the total dissolved solids (TDS) of groundwater (USGS 1977).

4.3.2 ALTERNATIVE 1: 1,000-FOOT FWS CLEARING

Those impacts identified for the proposed action including flow characteristics also are applicable to this alternative.

4.3.3 ALTERNATIVE 2: 2,000-FOOT CLEARING

Those impacts identified for the proposed action also are applicable to this alternative. The removal of vegetation would increase the conveyance capacity even greater than the proposed action, further reducing the impacts of flooding of adjacent floodplains but increasing peak flows below Gillespie Dam. Average depth of flow within the project area would decrease, and mean channel velocity would increase.

4.3.4 ALTERNATIVE 3: NO ACTION

Under the no action alternative the conveyance capacity of the channel would not be improved and flooding would not be alleviated.

Evapotranspiration perhaps would increase as areas now barren of vegetation would regenerate plant cover resulting in greater losses of groundwater. These losses would be partially offset by increased groundwater recharge due to the meandering nature of the stream channel.

4.4 SEDIMENTATION

The primary objective in clearing a channel of vegetation would be the reduction of erosion, floodwater, and sediment damages. The removal of

vegetation and continued maintenance of these cleared sections would allow swifter passage of floodwaters through the study area and reduce the probability and extent of flooding.

Under this alternative approximately 595 acres of salt cedar, 179 acres of mesquite, 72 acres of creosote/bursage, 46 acres of desert saltbush, 46 acres of blue paloverde/ironwood/smoke thorn, and 96 acres of common seepweed communities would be removed from inundation by a 100-year flood. Corresponding acres per community that would be removed from inundation by a 500-year flood include 466 acres of salt cedar, 19 acres of mesquite, 72 acres of creosote/bursage, 92 acres of desert saltbush, and 46 acres of blue paloverde/ironwood/smoke thorn.

4.5.4 ALTERNATIVE 3: NO ACTION

Under the no action alternative, no clearing would be conducted in the river channel other than those sections already approved, i.e., Ninety-first Avenue to One hundred twenty-third Avenue. In the absence of clearing or additional scouring of the river channel in future years, vegetative regeneration, predominantly salt cedar, would revegetate much of the channel cleared by the February 1980 flood.

Under current conditions, without clearing, a 100-year flood would inundate approximately 8,045 acres of salt cedar, 763 acres of mesquite, 112 acres of cottonwood/willow, 6 acres of paloverde/mixed cactus, 101 acres of creosote/bursage, 115 acres of desert salt cedar, 55 acres of the blue paloverde/ironwood/smoke thorn, and 500 acres of common seepweed. The corresponding acreage for the 500-year flood would be 8,138 acres of salt cedar, 809 acres of mesquite, 207 acres of desert saltbush, and 551 acres of common seepweed. The acreage for cottonwood/willow, paloverde/mixed cactus, creosote/bursage, and blue paloverde/ironwood/smoke thorn would be the same as for the 100-year flood.

4.6 WILDLIFE

4.6.1 PROPOSED ACTION: 1,000-FOOT CLEARING

4.6.1.1 Clearing Phase

The most significant adverse impact of the clearing project on wildlife

would be the loss of 1,510 acres of vegetation as described in section 4.5.1. Displaced wildlife would move to adjoining vegetated areas, adding to the competition for resources within those areas.

Among the impacts of lost habitat would be the effect on breeding white-winged doves and mourning doves due to a reduction of breeding habitat. Of the major habitat types, 1,450 acres of salt

cedar, 55 acres of mesquite, and 5 acres of cottonwood/willow would be lost. Based on the number of dove nests found per acre in salt cedar, productivity per nest, and the number of acres of salt cedar habitat removed, the loss in dove productivity can be estimated (Table 4.6-1). Utilizing nest density data reported by Shaw (1961) and productivity data reported by Brown (1980), white-winged dove annual production would be reduced by approximately 29,000 young and mourning dove annual production would be reduced by approximately 24,650 young for the lifetime of the project. These are conservative estimates and do not consider the increased frequency of nesting by displaced birds that would occur in vegetated areas outside of the clearing.

The proposed action would have no impact on any threatened or endangered species (Jackson 1981).

4.6.1.2 Operation Phase

A total of 4,130 acres of river channel would be maintained free of tree and shrub growth for the lifetime of the project. Vegetation consisting of annuals and perennials would develop where surface water is available or where subsurface water is present near the surface. Salt cedar would continue to flourish in these areas. Wildlife species restricted to the large stands of trees such as perching birds and larger mammals would be displaced by species adapted to open areas.

4.6.2 ALTERNATIVE 1: 1,000-FOOT FWS CLEARING

4.6.2.1 Clearing Phase

Based on the vegetative conditions within the study area in March 1980, implementation of this alternative would result in the loss of 955 acres of salt cedar, 30 acres of mesquite, and 5 acres of cottonwood-willow habitat. Wildlife dependent on these habitats would be displaced. White-winged dove productivity would be reduced by 19,100 young, and mourning dove productivity would be reduced by 16,235 young (Table 4.6-1).

Alternative 1 would have no impact on any threatened or endangered species (Jackson 1981).

4.6.2.2 Operation Phase

Under this alternative approximately 4,160 acres of river channel would be maintained free of tree and shrub growth. Impacts would be as described for the proposed action.

4.6.3 ALTERNATIVE 2: 2,000-FOOT CLEARING

4.6.3.1 Clearing Phase

Under this proposal approximately 3,180 acres of salt cedar, 85 acres of mesquite, and 15 acres of cottonwood-willow habitat would be lost. Wildlife species associated with this habitat would be displaced to suitable habitat in adjoining areas. This would result in lost dove productivity of 63,600 white-winged doves and 54,060 mourning doves.

Alternative 2 would have no impact on any threatened or endangered species (Jackson 1981).

4.6.3.2 Operation Phase

A total of 8,240 acres of river channel would be maintained free of tree and shrub growth for the lifetime of the project. Impacts would be as described for the proposed action.

4.6.4 ALTERNATIVE 3: NO ACTION

The no action alternative would result in no project-related impact on wildlife habitats and, subsequently, wildlife productivity. It is assumed that much of the area within the river channel that was scoured free of vegetation during the February 1980 flood would again become vegetated by salt cedar.

Alternative 3 would have no impact on any threatened or endangered species (Jackson 1981).

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TABLE 4.11-4

Damage Reduction Estimates for Three Flood Events
following Implementation of the Alternative Clearing Plans

| Percent Chance of Occurrence | $\frac{\Delta \%}{100}$ | 1,000-ft Clearing | | | 2,000-ft Clearing | | |
|----------------------------------|-------------------------|----------------------------------|---|--|----------------------------------|---|--|
| | | Damage ^a (\$1,000) | Average Damage ^b (\$1,000) | Average Annual Damage ^c | Damage ^a (\$1,000) | Average Damage ^b (\$1,000) | Average Annual Damage ^c |
| | .002 | | 2,776 | 5,552 | | 3,084 | 6,168 |
| 0.2 (500-year flood event) | | 2,776 | | | 3,084 | | |
| | .008 | | 3,498 | 27,984 | | 3,743.5 | 29,948 |
| 1.0 (100-year flood event) | | 4,220 | | | 4,403 | | |
| | .01 | | 2,505.5 | 25,055 | | 2,605.5 | 26,025 |
| 2.0 (50-year flood event) | | 791 | | | 802 | | |
| | .18 | | 395.5 | 71,190 | | 401 | 72,180 |
| 20 | | 0 | | | | | |
| Total Benefit | | | | \$129,781 | | | \$134,321 |

Note: Procedure established by U.S. Department of Agriculture, Soil Conservation Service 1972.

^aDerived from Table 4.11-3, the reduction in damages resulting from each clearing alternative.

^bEstimate of average damage reductions expected for all intermediate flood frequencies.

^cAverage annual damage reduction based on the change in the percent chance of occurrence/100 multiplied by the average damage reduction.

life of the project were ascertained. The difference between the no action alternative and the proposed action would indicate the "damages prevented" or benefits of the project. The annual benefits for the proposed action are projected to be \$129,781 (Table 4.11-4).

When annual benefits are compared to annual costs, the resultant difference would be the net benefit. For the 1,000-foot clearing action, the following presents the benefit/cost comparison:

| | |
|--------------------|-----------|
| Annual benefits | \$129,781 |
| Annual costs | 236,791 |
| Net benefits | -107,010 |
| Benefit/cost ratio | 0.55 |

Actual construction of the proposed project would be expected to have little impact upon the economy or lives of the area residents. The men and machines required for construction would have an imperceptible effect upon employment and income of the local economies. Attempts to quantify the actual impacts were unsuccessful due to the relative magnitude of the expenditures as compared with the strong economic influence of the metropolitan area. No impacts were discernible upon schools and public facilities or upon the need for services and consumer goods.

A survey was conducted of businesses that could be economically affected by both flooding and hunters drawn to the area. The types of businesses questioned were restaurants, cafes, service stations, country stores, grocery stores, sporting goods stores, hardware stores, motels, liquor stores, and fast food eating places. The results showed that the economic impact of hunters in the area was negligible.

Flooding events, on the other hand, had a varied effect on establishments within the same line of business. For example, some restaurants suffered a very noticeable loss of business that could not be reclaimed, while others flourished because area residents were flooded out of their homes and sought alternative eating arrangements. The same situation generally held true for almost all businesses interviewed. Overall the flood events appeared to depress business substantially.

4.11.1.3 Health Hazards and Danger to Life

The reduction in the number of residences, roads, and land area affected by flooding would result in a corresponding decrease in health hazards experienced by local residents. However, these hazards would continue to be significant, depending on the volume of peak flows.

4.11.3.2 Economic Impacts

4.11.3.2.1 Project Costs

The present value of the project costs for alternative 2 is \$7,530,222, with an annual equivalent cost of \$432,461 (Table 4.11-1).

4.11.3.2.2 Project Benefits

The same procedure for calculating potential property damage incurred by varying flood events for the 1,000-foot action was used to project damage for alternative 2 (Tables 4.11-3 and 4.11-4). Based on the field inventory, slightly more area would be protected by the increased clearing. The benefit/cost comparison for the 2,000-foot clearing is indicated below.

| | |
|--------------------|-----------|
| Annual benefits | \$134,321 |
| Annual costs | 432,461 |
| Net benefits | -298,140 |
| Benefit/cost ratio | 0.31 |

4.11.3.3 Health Hazards and Danger to Life

Under alternative 2, the reduction in health hazards due to flooding would correspond to the total number of homes and land area removed from the effect of a specific flood. However, as described for the proposed action, the hazards would continue to be significant.

4.11.4 ALTERNATIVE 3: NO ACTION

The no action alternative proposes no clearing action be undertaken in the Salt and Gila rivers. This would save more than \$12 million of local and state funds that would be expended for construction and maintenance of a 1,000-foot clearing for a 25-year period. These funds could then be used for alternative purposes. Implementation of alternative 2 would result in no reduction of flood losses totaling more than 22 and 23 million dollars for the 100- and 500-year flood events, respectively

(Table 4.11-3). Under this alternative the health hazards associated with flooding would continue unabated.

4.12 ENERGY

4.12.1 PROPOSED ACTION: 1,000-FOOT CLEARING

Implementation of the proposed action would require the expenditure of

fuel required for the clearing and grubbing operations for approximately 1,510 acres during the initial clearing operation and for a maximum of 4,130 acres at 2-year intervals. Use of this fuel for the clearing operations would prevent its availability for other uses.

4.12.2 ALTERNATIVE 1: 1,000-FOOT FWS CLEARING

Under this alternative, fuel will be required for the clearing of approximately 990 acres during the initial clearing operations. Maintenance clearing at 2-year intervals will involve a maximum of 4,160 acres.

4.12.3 ALTERNATIVE 2: 2,000-FOOT CLEARING

Fuel requirements for clearing and grubbing of vegetation within the 2,000-foot-wide channel would be approximately twice that required for either the proposed action or alternative 1. Approximately 3,280 acres would be cleared during the initial clearing and a maximum of 8,240 acres would require clearing at 2-year intervals.

4.12.4 ALTERNATIVE 3: NO ACTION

No fuel requirements would be required for clearing operations. Greater fuel requirements would be required to repair damages to farmlands, roads, and structures due to the greater area of land affected by floods.

4.13 MITIGATING MEASURES

4.13.1 AIR QUALITY

Confine all open burning activities to summer periods when the wind is from the east or northeast to allow smoke to drift away from urban development. Open burning must be confined only to vegetative debris.

Dust control measures such as periodically wetting the surface may be necessary on heavily used dirt access roads near populated areas. The need for such controls would be determined on an as needed basis.

4.13.2 WATER RESOURCES

Special precautions should be taken during clearing and grading activities to minimize siltation and the disturbance of substrates within existing water bodies along the channel corridor. Construction equipment would be restricted to designated stream crossings. Contractors employed to perform the clearing operations will be required to prevent spillage or leakage of fuel and oil from construction or service equipment.

4.13.3 WILDLIFE

Because of the designation of much of the study area as wildlife management areas, various mitigation plans have been discussed by the FWS (Metz 1981) in cooperation with the AGFD, Bureau of Land Management, Maricopa Audubon Society, FCD, Arlington Canal Company, Buckeye Irrigation Company, Arizona Wildlife Federation, and the Citizens for Water Control Development. The plans, if implemented, would adequately compensate for wildlife habitat lost as a result of the proposed clearing project.

Lost wildlife habitat due to either of the proposed clearing plans would be mitigated by implementing various improvements to the existing habitat after the areas had been cleared. Habitat improvements would be accomplished by implementing one or more of the following steps, depending on local conditions.

Replant with trees of greater value to wildlife.

Plant food crops where soil conditions are suitable.

Develop ponding areas.

Limit clearing of vegetation to strips approximately 100 feet wide.

(DEIS 124-127)

The following tree species would be planted in predesignated areas at the rate of 50 to 75 trees per acre, in 5-acre thickets at least 200 feet wide.

Fremont cottonwood (Populus fremontii)
Texas mulberry (Morier microphylla)
Mesquite (velvet) (Prosopis velutina)
Blue paloverde (Cercidium floridum)
Athe1 tamarisk (Tamarix aphylla)
Sycamore (Platanus wrighti)

Willows (Chilopsis linearis) would be planted in strips 10 to 15 feet wide at the rate of about 400 to 500 trees per mile.

All trees would be started from 4- to 5-foot high cuttings or rooted trees. Before planting, an 8-inch auger would be used to break up the soil layers down to the water table if possible, or at least 5 feet in depth.

Food crops would include grains such as sorghum, barley, and wheat and the following grass species:

Blue panic grass (Panicum antidotale)
Alkali sacaton (Sporobolus airoides)
Lahmann lovegrass (Eragiostis leimanniana)

Grass would be seeded to obtain a distribution of approximately 60 seeds per square foot (about 6 to 10 pounds per acre).

Ponding areas would be dug during the clearing operation with bulldozers or draglines. Although most ponds would be placed where a flow through is possible, some ponds would be excavated in high-groundwater areas to create open water. Ponds would be at least 4 feet in depth, cover about 1 to 2 acres, and have gently sloping banks.

(DEIS 124-127)

4.13.4 CULTURAL RESOURCES

Appropriate mitigation measures for the identification and preservation of cultural resources within the proposed channel clearing should be formulated and undertaken in consultation with the Arizona State Historic Preservation Officer and the Arizona Advisory Council on Historic Preservation pursuant to the 36 CFR Part 800 procedures (Ramnes 1981).

4.14 UNAVOIDABLE ADVERSE IMPACTS

Unavoidable adverse impacts are the adverse impacts of the proposed action or alternative that would not be mitigated. They are unavoidable mainly because either (1) the proposed action directly conflicts with a value or values, or (2) the cost of mitigation would be prohibitively high.

ADDENDUM TO REFERENCES CITED

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