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In Reply Refer To:
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22410-2008-F-0195
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March 3, 2008

Mr. James T. Shoaff
Field Manager
Bureau of Land Management
Yuma Field Office
2555 East Gila Ridge Road
Yuma Arizona 85365-2240

Re: Biological Opinion for the Proposed Right-of-Way for Vegetation Treatment Program in the Limitrophe Division for Safety and Law Enforcement, Lower Colorado River, Yuma County, Arizona

Dear Mr. Shoaff:

Thank you for your request for formal consultation with the U.S. Fish and Wildlife Service (USFWS) pursuant to section 7 of the Endangered Species Act of 1973 (16 U.S.C. 1531-1544), as amended (ESA). Your initial request was dated and received by us on October 19, 2007. Your amended Biological Assessment (BA) and request was dated and received by us electronically on February 18, 2008. At issue are impacts that may result from the proposed Right-of-Way for Vegetation Treatment Program in the Limitrophe Division for Safety and Law Enforcement, Lower Colorado River, Yuma County, Arizona. The proposed action would grant a right-of-way to the Army Corps of Engineers (ACOE), acting on behalf of the Border Patrol, for vegetation treatments to improve visibility and discourage crime in the Limitrophe area (that portion of the Colorado River from the Northerly International Boundary [NIB] to the Southerly International Boundary [SIB]) in Yuma County, Arizona for 10 years. At issue are impacts from the proposed vegetation treatments that may affect the endangered southwestern willow flycatcher (*Empidonax traillii extimus*) and the endangered Yuma clapper rail (*Rallus longirostris*). You also requested recommendations for the candidate yellow-billed cuckoo (*Coccyzus americanus*). We will provide technical assistance on this species to you through separate correspondence.

This biological opinion is based on information provided in the February 15, 2008 BA, February 14, 2008 Environmental Assessment (EA), documents in our files, a November 16, 2007 site visit, and other sources of information. Literature cited in this biological opinion is not a complete bibliography of all literature available on the species of concern, vegetation clearing and its effects, or on other subjects considered in this opinion. A complete administrative record

of this consultation is on file at this office. In keeping with our trust responsibilities to American Indian Tribes, by copy of this memorandum, we notify the Cocopah and Quechan Tribes, which may be affected by the proposed action. We encourage you to invite the Bureau of Indian Affairs to continue participating in the review of this action. We also encourage you to coordinate this project with the Arizona Game and Fish Department.

CONSULTATION HISTORY

- June 8, 2007. Received a draft BA from your office.
- September 20, 2007. Received a revised draft BA.
- September 25, 2007. Provided comments on the draft BA, including comments regarding the development of the Limitrophe Mitigation Plan.
- January 11, 2008. Staff participated in a meeting with BLM, Customs and Border Protection (CBP or Border Patrol), Bureau of Reclamation (USBR), and ACOE to discuss information needs and the schedule for completion. During this meeting, the following changes were made to the project: a) the width of treatment area was reduced from 900 to 600 feet in the southernmost part of the project making the width of the entire project area no greater than 600 feet and reducing the total number of acres to be treated, b) the treatment area was eliminated as a potential mitigation site for replacement habitat because it would be subject to future vegetation treatment. It was agreed that the project would adhere to best management practices developed for use in all CBP projects and that mitigation criteria would be developed as a conservation measure. ACOE agreed to provide a description of future CBP projects to be proposed.
- January 17 and 18, 2008. We met with your staff to develop mitigation criteria.
- January 25, 2008. We discussed project status and information needs with your staff.
- January 28 through February 8, 2008. We worked with your staff to refine draft mitigation criteria and conservation measures.
- January 25, 2008. We discussed information needs with ACOE.
- February 8, 2008. We received the information requested from ACOE.
- February 14, 2008. We received the final EA and the revised mitigation criteria via electronic mail.
- February 15, 2008. We received a final BA via electronic mail. Formal consultation was initiated with a request for expedited completion of the BO.
- February 15, 2008. We sent questions to BLM on the final BA regarding mitigation acreage calculations and mitigation criteria via electronic mail.

- February 19, 2008. We received clarification on mitigation acreage calculations and mitigation criteria via electronic mail.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

The BLM proposes to authorize the ACOE, acting on behalf of the Border Patrol- Yuma Sector, hereinafter identified as "the proponent," to alleviate the border security and public health and safety threat through a series of targeted vegetation treatments via a grant of a right-of-way (ROW) on public lands suitable for treatment under specific prescriptions, for a period of 10 years. The International Boundary and Water Commission (IBWC), USBR, and Yuma County Sheriff's Office (YCSO) are also partners. As BLM must ultimately approve the ROW, BLM is the lead Federal agency for purposes of this section 7 consultation under the ESA. The proposed action and detailed project description are described in detail in the February 2008 BA, prepared by the Yuma Field Office of BLM (Bureau of Land Management 2008), and are summarized below.

The action area for the proposed project includes approximately 23.7 linear miles of riparian land along and bordering the Colorado River, Yuma County, Arizona. This river reach, known as the Limitrophe Division, forms the border between the United States and Mexico and includes 1,392 acres of BLM-administered public land. Proposed vegetation treatment sites and vegetation types are mapped in Appendix A of the BA and are included in this document.

The YCSO, U.S. Border Patrol – Yuma Sector (Border Patrol), and Cocopah Indian Tribe have characterized the Limitrophe as extremely dangerous due to the high incidence of illicit activity and border crossings. An increase in violent criminal acts such as assault, rape, and murder are occurring in the Limitrophe area. These crimes target both Mexican and American citizens. Additionally, firefighters and law enforcement officials in the above agencies and in BLM are put at higher risk from ambushes or sniper attack due to the dense cover provided by vegetation in this highly dangerous area. The proposed vegetation treatments would remove cover to expose high-crime areas and help to protect law enforcement officials, illegal immigrants, firefighters, and the general public.

The proponent would be responsible for coordinating the proposed project with the ACOE Regulatory Branch. The ACOE would provide guidance and permits related to project implementation due to proximity to the river, wetlands, floodplain management, and Clean Water Act restrictions. Agency Coordination would be performed through regular meetings of the Border Management Task Force (BMTF). Interested stakeholders, including USBR, IBWC, Arizona Game and Fish Department (AGFD), Border Patrol, and YCSO would address project implementation during BMTF meetings.

BLM's ROW (BLM Case number AZA 34173) would grant Border Patrol the approval to conduct vegetation treatments, maintenance, and mitigation for the proposed project. It would be

the responsibility of the proponent to adhere to guidance detailed in BLM's EA for this project, and subsequent decision record, concerning implementation, maintenance, and mitigation for the proposed project. It would also be the responsibility of the proponent to provide funding, labor, and materials to implement the mitigation plan and ensure the survivorship of plants within the mitigation areas. Border Patrol would fund and ensure implementation of the proposed action. The BLM would be responsible to ensure that the Border Patrol complies with the proposed action including the mitigation.

Vegetation treatment prescriptions, maintenance of the treatment areas for the term of the 10-year ROW permit, and conservation measures to minimize the impacts to riparian habitats and endangered species are components of the proposed action.

Vegetation Treatments

The proposed action would create an enforcement zone through the application of four different vegetation treatment prescriptions along a 600-foot wide corridor west of the USBR levee road (see maps in Appendix A). In some locations, the treatment areas may be less than 600 feet if it meets the purpose of the proposed action.

Vegetation treatments are assigned to lower Colorado River (LCR) vegetation classifications developed by Anderson and Ohmart (1984), which are still used today. This methodology categorizes vegetation according to dominant species and structure type and was used in mapping the riparian corridor in 2004 (BIO-WEST 2006). Each vegetation type is characterized by dominant tree species and percent composition. The vegetation types present in the project area are: Agriculture, Arrowweed, Cottonwood-Willow, Marsh, Open Water, Saltcedar, Saltcedar-Mesquite, Structured Open Water, and Undetermined (Table 1).

Prescriptions
A total of 560.8 acres is proposed for treatment. Over half of these treatment acres are in saltcedar vegetation and just over 68 acres are in cottonwood-willow vegetation (Table 2). The four vegetation prescriptions, as presented in the BA for this project, are described below:

Prescription A - In areas of dense stands of saltcedar, rubber tired or tracked vehicles such as bullhog, hydro-ax, or similar equipment would be used to mechanically mulch, chip, or shred vegetation to ground level. Bulldozers or other bladed equipment would not be used. Native tree species, such as cottonwood or mesquite, would be avoided.

Prescription B - Hand removal (hand tools or chain saw) of vegetation would occur in areas of cottonwood and willow or mixed trees and shrubs where proximity of species prevents the use of heavy equipment. Edges of community types are included in this prescription. Vegetation would be removed to ground level and native tree species such as cottonwood, willow, and mesquite, as well as non-native athel tamarisk (*Tamarix aphylla*) would be left and pruned where necessary. Hand cleared vegetation would be chipped by using a portable mulcher or scattered evenly throughout the project area as directed by project monitors. Proponent would prune native trees and athel tamarisk using approved horticultural practices including proper sanitizing techniques to prevent the potential spread of disease. No more than one-third of each individual

tree would be pruned from ground level up to a maximum of 8 feet. For example, on an 18 foot tall cottonwood tree the lowest 6 feet would be pruned, from the ground to a height of 6 feet. Pruning would only affect those trees where increased visibility is needed to achieve safety objectives.

Prescription C - Mechanical and hand removal of vegetation would occur along levees and steep banklines. Treated vegetation would be mulched and left on site. Native trees such as cottonwood, willow, and mesquite, as well as athel tamarisk, identified in these areas would be treated as described in prescription B. Other native species, such as arrowweed or saltbush, would be treated as necessary to meet the purpose and need.

Prescription D - Mechanical treatment using bullhog would occur in patchy stands dominated by shrubs. Standing dead material would be mulched, and live plants would be thinned as needed to maintain visibility.

Because the treatments would vary in size and prescription for each site, the time spent on each treatment area would vary. Each treatment would require approximately one day for staking and flagging and one day for follow-up monitoring to document as-built conditions. Mechanical treatments by rubber-tired or tracked vehicles such as bullhog, hydro-ax, or similar equipment, as described for prescriptions A, some aspects of C, and D, can average 10 acres per day. Once treated and reduced to mulch in a single pass, the machinery does not revisit the same spot, but continues on. Therefore, time spent treating any given acre would be transitory. The amount of time required for mechanical maintenance treatments would be similar for initial treatments. Hand treatment times would be the most variable, but would occur over smaller areas. Herbicidal maintenance treatments may require half the time, or less, than mechanical and hand treatments.

Maintenance of Treatment Areas for 10 Years

The proponent would maintain the project site to the extent required to meet the purpose of the proposed action. Follow-up treatment could use mechanical or hand treatments, following one of the four prescriptions described above, or include using herbicides. Herbicides would not be used to maintain pruned trees. The proposed project incorporates BLM Programmatic EA-AZ-320-2005-0026, by reference, which outlines specific procedures for herbicide applications using a variety of Integrated Pest Management techniques. The application techniques will be followed for this project. Herbicide application would employ a combination of spot, cut-stump, foliar, broadcast, and hand-wipe types of treatment. Only BLM-approved Environmental Protection Agency-listed herbicides would be used, and application would follow guidelines in approved Pesticide Use Proposals. At this time, the herbicides with active ingredients of imazapyr, triclopyr, and glyphosate are being analyzed. Additional herbicide formulations would require additional NEPA analysis. A list of BLM-approved herbicides and Pesticide Use Proposals detailing herbicide application methods for the proposed action are found in Appendix C of the project EA.

An exception to BLM Programmatic EA-AZ-320-2005-0026 is that tractor or vehicle mounted spray rigs would be permissible at any time of the year. This additional flexibility would allow for greater efficacy of spray treatments. Herbicide treatments would require the proponent to

adhere to wind and temperature restrictions to reduce drift. Specifically, the use of triclopyr would only be allowed to be used when daytime temperatures are not forecast to rise above 85 degrees. At this temperature, the triclopyr volatilizes and treatments have decreased success and a greater chance of causing mortality to non-target species.

Conservation Measures

The proposed action contains the following conservation measures that would minimize the adverse effects to the flycatcher and clapper rail. The following practices would be applied to all four prescriptions.

- BLM would identify an agency representative familiar with the area and with knowledge of the vegetation community types to delineate the project area prior to clearing and trimming activities.
- Vegetation targeted for retention would be flagged to reduce the likelihood of being treated.
- Periodic visits by the agency representative would ensure that prescriptions are followed and performed in the appropriate community types.
- The proponent would be responsible for having a biological monitor present on-site during initial treatments and follow-up maintenance work. The biological monitor will provide the BLM with monthly reports summarizing work progress and immediately notify BLM if the proponent does not comply with the proposed action.
- The proponent would notify BLM 10 days prior to implementing retreatments.
- Where vegetation to be cleared is on the levee, the method of removal would ensure that the integrity of the levee is maintained.
- Athel tamarisk and native trees would be left onsite with no more than one-third of each individual tree being pruned from the ground up to a maximum of 8 feet. For example a 24-foot tree could be pruned 8 feet up from the ground.
- Where practical, stands of arrowweed, which have traditional value for several Native American tribes, would be left onsite and avoided by project activities.
- A 10-foot wide no-treatment buffer would be implemented around wetland habitats (including marsh), areas within the high water line, and the edge of saturated soils.
- Plants occurring in river channels, such as bulrush (*Scirpus californicus* or *Scirpus* spp.) and cattail (*Typha* sp.), would not be treated.
- Project operations, including both initial treatment and subsequent maintenance, would be timed to avoid the migration, breeding, and nesting timeframe of special status species.
- Mechanical vegetation treatment and re-treatment would occur between October 1 and March 31.
- Herbicide re-treatments would occur throughout the year.

Proposed "Mitigation" for BLM Right of Way Permit

As described in the BA, BLM is "requiring mitigation" from the project proponents for the vegetation treatments (Bureau of Land Management 2008). To offset or minimize effects for reduced endangered species habitat value and to conform with the 1987 Yuma District Resource Management Plan and BLM policy, the proponents would be responsible for replacing lost habitat as part of the ROW grant. Best management practices developed by BLM for revegetating riparian habitats in this region are provided in Appendix D in the BA for this project. In accordance with the revegetation enhancement calculations published in A Vegetation Management Study for the Enhancement of Wildlife Along the Lower Colorado River (Anderson and Ohmart 1984) and ongoing restoration projects conducted along the Colorado River under the Multispecies Conservation Plan (Bureau of Reclamation 2004), BLM and USFWS developed mitigation criteria cooperatively that the proponent is required to follow for cottonwood-willow, saltcedar, and arrowweed habitat removed (see BA, Appendix B, entitled "Steps for Evaluating, Creating, and Maintaining Replacement Habitat"). The criteria specify that the proponent must replace treated habitat with higher quality replacement habitat outside the treatment area (600 foot wide corridor), either within the Limitrophe or as close to the Limitrophe as possible. If saltcedar or other vegetation is removed from the mitigation site (site to be revegetated) to accommodate plantings, the mitigation ratios would be adjusted to account for the extra vegetation loss. Mitigation within the treatment area is not acceptable because vegetation would have to be planted at such low densities to maintain visibility it would have little benefit to wildlife.

In determining how to mitigate the impacts of the proposed action, Table 3, taken from Table 13-2 of Chapter 13 of Anderson and Ohmart (1984) was used to calculate the value of the treated and replacement habitats. Vegetation structure types along the LCR are described in Table 4 (Anderson and Ohmart 1984). In Table 3, the numbers in the second column labeled "Average number of wildlife categories ranking in top three" represent the wildlife habitat value of each riparian vegetation community type. Multiplying the number of acres by the habitat value of the community type gives an index of relative worth. The number of replacement acres can be calculated by using the following formula for a different habitat of equal value. The number of acres of replacement habitat = (number of acres of the vegetation community type to be treated multiplied times the value of the community type to be treated in column two of Table 3) divided by the value in column two for the replacement habitat type for CW or HMIII. For treated SC and SH, the value "4" is used based on the acreages BLM calculated for the actual structure types mapped in 2004. Structure type III and a value of "20" is used for HM because it is identified as the goal for HM revegetation projects in Anderson and Ohmart (1984). For CW replacement habitat, the value "23" is used because it is the median for the structure types used by flycatchers (CW II, CW III, CW IV) and the goal of the replacement habitat. The number of mitigation acres and methods for calculating mitigation acres for each habitat type treated are shown in Table 5.

Approximately 68.2 acres of cottonwood-willow, 377.8 acres of saltcedar or saltcedar-mesquite, and 70.4 acres of arrowweed habitat will be removed or pruned, reducing the amount of avian feeding, breeding, sheltering, and migration habitat within a 23 mile, 600 feet, corridor along the LCR (Table 5). Although the proponent would be responsible for establishing 134-144 acres of

higher quality cottonwood-willow and honey mesquite habitat offsite, 417-427 more acres will be removed or pruned than will be revegetated. Given that the replacement acreage is only a fraction of the treated acreage, adherence to criteria that maximize the probability of successful revegetation is crucial. The proponents would be responsible for developing a final mitigation plan based on these criteria under the approval and oversight of BLM and USFWS, with assistance from AGFD. Additional Section 7 consultation will be conducted on potential revegetation sites as part of the evaluation process in the Steps for Evaluating, Creating, and Maintaining Replacement Habitat (see BLM's BA, Appendix B, for this project).

The steps for evaluating, creating, and maintaining replacement habitat are discussed in detail in Appendix B in the BA for this project. The proponent would be required to monitor and maintain the mitigation areas for a minimum of 10 years from the time of planting or until the trees are surviving on their own without maintenance. Site-specific mitigation plans would be designed to maximize the benefits to wildlife. BLM, as the authorizing agency, would be responsible for oversight and accounting for these mitigation prescriptions. If the mitigation does not meet the standards as described in these mitigation plans, the proponent would be required to re-plant vegetation and the monitoring period would be extended.

Mitigation Objectives

The purpose of the mitigation required in BLM's ROW permit to the project proponent is to offset treatment effects by creating and maintaining replacement habitat. Replacement habitat would be a mix of cottonwood-willow and honey mesquite types, with as much cottonwood and willow planted as the site can support. Successful replacement habitat would have the characteristics of CW II, CW III, CW IV, and HM III (Anderson and Ohmart 1984). Sites that can provide replacement habitat to support willow flycatchers are of the greatest priority (Table B2 in Appendix B in BA). The habitat characteristics of flycatcher replacement habitat include patch width greater than 32 feet, patch size greater than 10 acres, canopy height averaging greater than 13 feet, canopy closure averaging greater than 70% total from the ground to the canopy, vertical foliage density greatest between 3 and 13 feet above ground, mean diurnal temperature between 79° F and 91° F, mean maximum diurnal temperature averaging between 90° F and 113° F, mean diurnal relative humidity greater than 33%, and mean soil moister minimum of 17% and average of 23% (Table B2 in BA; McLeod *et al.* 2005, Koronkiewicz *et al.* 2005).

The desired goal would be to create cottonwood-willow stands that exceed the habitat value of existing cottonwood-willow stands on the LCR by supporting:

- Greater density of cottonwood and willow trees than the minimum 10 percent density that constitutes cottonwood-willow land cover under the Anderson and Ohmart classification system (1984). In the Anderson and Ohmart (1984) study, diversity and abundance of wildlife tended to increase with increasing proportions of cottonwood and willow trees (Bureau of Reclamation 2004).
- Greater diversity of plant species than are typically associated with existing stands.
- Greater structural diversity associated with creation of multiple layers of vegetation and seral stages than existing cottonwood-willow stands on the LCR.

- Saltcedar that would likely become established on its own and can be an important component of wildlife habitat, including flycatcher habitat (U.S. Fish and Wildlife Service 2002). Creation of patches of honey mesquite in and adjacent to patches of cottonwood-willow to more closely approximate the distribution of riparian vegetation that was present along the historical gradient of the LCR floodplain (Bureau of Reclamation 2004).

Monitoring
The proponent would monitor mitigation sites and provide reports annually to ensure plantings are progressing toward the desired habitat conditions, until the mitigation obligation is complete. The mitigation plan will include measurable requirements for achieving CW II, CW III, CW IV, and HM III replacement habitat. The annual reports will include evaluation of habitat monitoring data based on thresholds and trigger points identified in the mitigation plan. Thresholds would be included in the monitoring plan to signal that conditions are appropriate and to continue current management practices. Trigger points would be included in the monitoring plan that signal the need to alter current management activities to achieve goals for the restoration site. The trigger points include:

- Microclimate, water, and vegetation conditions have not achieved the desired results of replacement patch size and width; density of cottonwood, willow, and mesquite; canopy height; canopy closure; and vertical foliar density.
- Habitat conditions (as determined by microclimate, soil moisture, vegetation measures) are declining, which are likely to result in a subsequent decline in replacement habitat quality.
- Habitat needs exceeded water availability.
- If after year 1 the foliage density is less than 95% of the goal density and after year 3 is less than 90% of the goal density, dead trees would be replaced.
- Time required to maintain the site would be extended beyond 10 years if thresholds are consistently not being met and trigger points are reached or exceeded.
- If trees (seedlings and saplings) are surviving, but not growing, additional measures, such as providing additional irrigation or removing limiting factors should be implemented.

Schedule of Tasks
A schedule of tasks, excerpted from Appendix B in the BA, was developed jointly by USFWS and BLM (Table 6). If the proponent does not make acceptable progress towards mitigation objectives by meeting these timelines, or does not ensure the maintenance and stabilization of these vegetation resources, BLM would consider the ROW grant in non-compliance and begin administrative actions to resolve the non-compliance, which could include suspension of work.

Required Stipulations as per BLM's BA

Physical Stipulations
Existing access roads approved by the BLM agency representative and roads on the Colorado River levee and bankline structures would provide access to the work sites and provide staging

areas. No new roads would be authorized under this right-of-way grant. Repetitive routine administrative vehicle use would be discouraged or minimized in treatment areas. Large boulders or other means of restricting motorized access into treated areas may be used to protect habitat in fuel breaks and treatment areas following conservation measure number WF-5 in Arizona Statewide Land Use Plan Amendment for Fire, Fuels, and Air Quality Management (Bureau of Land Management 2004).

All fuels, waste oils, and solvents would be collected and stored in tanks or drums and removed immediately from the site. The refueling of machinery would be completed following accepted guidelines, and all vehicles would have drip pans during storage to contain minor spills and drips. Any spill of five gallons or more would be contained immediately within an earthen dike, and the application of an absorbent (e.g., granular, pillow, sock, etc.) would be used to absorb and contain the spill. Any spill of five gallons or more of a hazardous or regulated substance would be reported immediately to on-site environmental personnel who would notify appropriate Federal and state agencies. A Spill Prevention, Containment, and Countermeasures Plan would be in place prior to the start of construction and all personnel would be briefed on the implementation and responsibilities of this plan. All waste oil and solvents would be recycled. All non-recyclable hazardous and regulated wastes would be collected, characterized, labeled, stored, transported, and disposed of in accordance with all Federal, state, and local regulations, including proper waste manifesting procedures.

Enclosed solid waste receptacles would be maintained at staging areas. Non-hazardous solid waste (trash) would be collected and deposited in the on-site receptacles. Solid waste would be collected and disposed of by a local waste disposal contractor.

Any illegal dumps discovered during clearing operations would be reported to the BLM to make a determination of whether hazardous materials are present and the appropriate site-specific mitigation needed to alleviate the problem.

Biological Stipulations
The Biological Monitor would periodically perform site visits to ensure compliance with the Biological Opinion.

Construction or development of a crossing for motorized vehicles across a perennial stream would not be permitted, unless an established road already exists. Access to project sites would not cross marsh habitat, unbridged structured open water, or open water. Crossings of dry or intermittent reaches would be allowed. Surface disturbance of channel banks adjacent to open water or structured open water would be avoided. Flagging and monitors would mark routes away from such areas.

Herbicide application would not occur in clapper rail habitat (marsh or adjacent open water) and drift-inhibiting agents would be used to assure that the herbicide does not enter adjacent marsh areas.

STATUS OF THE SPECIES
Southwestern willow flycatcher

Listing history

The southwestern willow flycatcher was listed as endangered, without critical habitat on February 27, 1995 (U.S. Fish and Wildlife Service 1995). Critical habitat was later designated on July 22, 1997 (U.S. Fish and Wildlife Service 1997a). A correction notice was published in the Federal Register on August 20, 1997 to clarify the lateral extent of the designation (U.S. Fish and Wildlife Service 1997b). On May 11, 2001, the 10th Circuit Court of Appeals set aside designated critical habitat in those states under the 10th Circuit's jurisdiction (New Mexico). The USFWS decided to set aside critical habitat designated for the flycatcher in all other states (California and Arizona) until it could re-assess the economic analysis. On October 19, 2005, the USFWS re-designated critical habitat for the flycatcher (U.S. Fish and Wildlife Service 2005). A total of 737 river miles across southern California, Arizona, New Mexico, southern Nevada, and southern Utah were included in the final designation. The lateral extent of critical habitat includes areas within the 100-year floodplain. The primary constituent elements of critical habitat include riparian plant species in a successional riverine environment (for nesting, foraging, migration, dispersal, and shelter), specific structure of this vegetation, and insect populations for food. A variety of river features such as broad floodplains, water, saturated soil, hydrologic regimes, elevated groundwater, fine sediments, etc. help develop and maintain these constituent elements (U.S. Fish and Wildlife Service 2005).

A final recovery plan for the flycatcher was signed by the USFWS's Region 2 Director on August 30, 2002, and was released to the public in 2003 (U.S. Fish and Wildlife Service 2002). The Plan describes the reasons for endangerment, current status of the flycatcher, addresses important recovery actions, includes detailed issue papers on management issues, and provides recovery goals. Recovery is based on reaching numerical and habitat related goals for each specific Management Unit established throughout the subspecies range and establishing long-term conservation plans (U.S. Fish and Wildlife Service 2002).

Species Description

The flycatcher is a small grayish-green passerine bird (Family Tyrannidae) measuring approximately 5.75 inches. It has a grayish-green back and wings, whitish throat, light gray-olive breast, and pale yellowish belly. Two white wingbars are visible (juveniles have buffy wingbars). The eye ring is faint or absent. The upper mandible is dark, and the lower is light yellow grading to black at the tip. The song is a sneezy fitz-bew or a fit-a-bew, the call is a repeated whitt.

Reasons for endangerment
Reasons for decline have been attributed to primarily loss, modification, and fragmentation of riparian breeding habitat, along with a host of other factors including loss of wintering habitat and brood parasitism by the brown-headed cowbird (Sogge *et al.* 1997, McCarthey *et al.* 1998). Habitat loss and degradation are caused by a variety of factors, including urban, recreational, and agricultural development, water diversion and groundwater pumping, channelization, dams, and past excessive livestock grazing. Fire is an increasing threat to willow flycatcher habitat (Paxton *et al.* 1996), especially in monotypic saltcedar vegetation (DeLoach 1991) and where water diversions and/or groundwater pumping desiccates riparian vegetation (Sogge *et al.* 1997).

Brood parasitism
Willow flycatcher nests are parasitized by brown-headed cowbirds (*Molothrus ater*), which lay their eggs in the host's nest. However, in many parts of the range where flycatchers and cowbirds coexist, parasitism is low (less than 10%) (U.S. Fish and Wildlife Service 2002, Rothstein *et al*. 2003). Feeding sites for cowbirds are enhanced by the presence of livestock and range improvements such as waters and corrals; agriculture; urban areas; golf courses; bird feeders; and trash areas. In some parts of the range, when these feeding areas are in close proximity to flycatcher breeding habitat, especially coupled with habitat fragmentation, cowbird parasitism of flycatcher nests may increase. Increased parasitism does not necessarily result in reduced flycatcher productivity, especially if renesting occurs (U.S. Fish and Wildlife Service 2002). The Recovery Plan recommends cowbird trapping and removal only when nest parasitism is greater than 20-30%.

Habitat
The flycatcher breeds in dense riparian habitats from sea level in California to approximately 8'500 feet in Arizona and southwestern Colorado. Historic egg/nest collections and species' descriptions throughout its range, describe the flycatcher's widespread use of willow (*Salix* spp.) for nesting (Phillips 1948, Phillips *et al.* 1964, Hubbard 1987, Unitt 1987, San Diego Natural History Museum 1995). Currently, flycatchers primarily use Geyer willow (*Salix geyeriana*), coyote willow (*Salix exigua*), Goodding's willow (*Salix gooddingii*), boxelder (*Acer negundo*), saltcedar (*Tamarix* sp.), Russian olive (*Elaeagnus angustifolio*), and live oak (*Quercus agrifolia*) for nesting. Other plant species less commonly used for nesting include: buttonbush (*Cephalanthus* sp.), black twinberry (*Lonicera involucrata*), cottonwood (*Populus* spp.), white alder (*Alnus rhombifolia*), blackberry (*Rubus ursinus*), and stinging nettle (*Urtica* spp.). Based on the diversity of plant species composition and complexity of habitat structure, four basic habitat types can be described for the flycatcher: monotypic willow, monotypic exotic, native broadleaf dominated, and mixed native/exotic (Sogge *et al.* 1997).

Saltcedar is an important component of the flycatchers's nesting and foraging habitat in Arizona and other parts of the bird's range. In 2001 in Arizona, 323 of the 404 (80 percent) known flycatcher nests (in 346 territories) were built in saltcedar trees (Smith *et al.* 2002). Saltcedar had been believed by some to be a habitat type of lesser quality for the flycatcher, however comparisons of reproductive performance (U.S. Fish and Wildlife Service 2002), prey populations (Durst 2004) and physiological conditions (Owen and Sogge 2002) of flycatchers breeding in native and exotic vegetation found no difference (Sogge et *al.* 2005).

Open water, cienegas, marshy seeps, or saturated soil are typically in the vicinity of flycatcher territories and nests; flycatchers sometimes nest in areas where nesting substrates were in standing water (Maynard 1995, Sferra *et al.* 1995, 1997). However, hydrological conditions at a particular site can vary remarkably in the arid Southwest within a season and among years. At some locations, particularly during drier years, water or saturated soil is only present early in the breeding season (i.e., May and part of June). However, the total absence of water or visibly saturated soil has been documented at several sites where the river channel has been modified (e.g. creation of pilot channels), where modification of subsurface flows has occurred (e.g. agricultural runoff), or as a result of changes in river channel configuration after flood events (Spencer *et al.* 1996).

The flycatcher's habitat is dynamic and can change rapidly: nesting habitat can grow out of suitability; saltcedar habitat can develop from seeds to suitability in five years; heavy runoff can remove/reduce habitat suitability in a day; or river channels, floodplain width, location, and vegetation density may change over time. The flycatcher's use of habitat in different successional stages may also be dynamic. For example, over-mature or young habitat not suitable for nest placement can be occupied and used for foraging and shelter by migrating, breeding, dispersing, or non-territorial flycatchers (McLeod *et al.* 2005, Cardinal and Paxton 2005). That same habitat may subsequently grow or cycle into habitat used for nest placement. Because of those changes, flycatcher "nesting habitat" is often described as occupied, suitable, or potential (U.S. Fish and Wildlife Service 2002). Areas other than locations where nests are located (foraging, sheltering, territory defense, singing, etc.) can also be "occupied flycatcher habitat," and as a result, essential to the survival and recovery of the flycatcher (U.S. Fish and Wildlife Service 2002). The development of flycatcher habitat is a dynamic process involving, maintenance, recycling, and regeneration of habitat. Flycatcher habitat can quickly change and vary in suitability, location, use, and occupancy over time (Finch and Stoleson 2000).

Migration habitat is believed to primarily occur along riparian corridors (U.S. Fish and Wildlife Service 2007b). Migrating flycatchers use a variety of riparian habitats, including ones dominated by natives or exotic plant species, or mixtures of both. Where native and non-native habitats co-occur, preliminary evidence suggests that migrating flycatchers favor native habitats, especially willow (Yong and Finch 1997), possibly because of higher insect availability (Moore *et al.* 1993, DeLay *et al*. 1999). Migrant flycatchers are also found, though less commonly, in non-riparian habitats (U.S. Fish and Wildlife Service 2002). Many of the willow flycatchers found migrating through riparian areas are detected in riparian habitats or patches that would be unsuitable for breeding (*e.g.*, the vegetation structure is too short or sparse, or the patch is too small). Such migration stopover areas, even though not used for breeding, are critically important resources affecting productivity and survival (U.S. Fish and Wildlife Service 2002).

Continuing Threats

Continuing threats rangewide include development, urbanization, grazing, recreation, native and non-native habitat removal, dam operations, river crossings, and ground and surface water extraction, etc. Stochastic events also continue to change the distribution, quality, and extent of flycatcher habitat.

Past Consultations
Since listing in 1995 to 2005, at least 154 Federal agency actions have undergone (or are currently under) formal section 7 consultation throughout the flycatcher's range

The most comprehensive section 7 consultation on the LCR, the biological and conference opinion on operations and maintenance, dated April 30, 1997, directed USBR to implement Reasonable and Prudent Alternatives (RPAs) to: 1) protect approximately 1,400 acres of currently unprotected occupied or potential flycatcher habitat through acquisition, easements, partnerships, and other means; 2) provide protective management for willow flycatchers and suitable habitat on the LCR through fire prevention planning, fencing, cowbird control, public education; 3) conduct five years of willow flycatcher research and monitoring on the LCR, and conduct other studies or projects that contribute to willow flycatcher conservation; 4) identify historical willow flycatcher habitat on the LCR that no longer exists and is unrestorable, and develop management recommendations for the MSCP to compensate for loss of habitat, through acquisition, easements; and 5) evaluate effectiveness of modified or removed channels on comparable river systems, assess how and where to modify or remove channels to restore riparian habitat on the LCR, and evaluate the success of different habitat restoration demonstration projects on the LCR (U.S. Fish and Wildlife Service 1997). Implementation of the RPAs to create and restore flycatcher habitat is being carried out through the LCR Multi-species Conservation Plan (Bureau of Reclamation 2004). To the extent practicable, these habitats are to be distributed throughout the LCR to maintain or establish connectivity and to integrate with wet sloughs and marshes. The MSCP establishes that the vegetative composition of created cottonwood-willow land will exceed the proportion of native plant species described in, and the vegetative structure will be consistent with, Anderson and Ohmart (1984) vegetation classification types. The diversity and abundance of wildlife along the LCR is known to increase with increasing proportions of cottonwood and willow trees, based on the studies conducted by Anderson and Ohmart.

Recovery Goal
The recovery goal of the Lower Colorado Recovery Unit, composed of 7 Management Units, is 525 territories (U.S. Fish and Wildlife Service 2002). The 164 territories documented as of year 2006 are far below the goal of 525 territories for this recovery unit (Durst et *al.* 2008). Although this is a main corridor for migrating willow flycatchers, few of these migrants remain to establish territories during the breeding season within the Parker-SIB Management Unit in recent years. Based on flycatcher and habitat records from the early 1900s, this area supported a greater amount of suitable habitat and breeding willow flycatchers prior to dam construction and water management activities (U.S. Fish and Wildlife Service 2002). The flycatcher was once abundant near the confluence of the Gila and Colorado rivers (T. Huels in litt., transcripts of H.Brown's 1902 field notes).

Yuma Clapper Rail

Listing History
The Yuma clapper rail was listed as an endangered species on March 11, 1967 under endangered species legislation enacted in 1966 (Public Law 89-669). Only populations found in the United States were listed as endangered; those in Mexico were not listed under the 1966 law or the

subsequent Endangered Species Act of 1973 (as amended). Critical habitat has not been designated for the clapper rail. The Yuma Clapper Rail Recovery Plan was completed in 1983 (U.S. Fish and Wildlife Service 1983). A five-year status review was completed in 2006 (U.S. Fish and Wildlife Service 2006).

Species Description
The clapper rail is a 14-16 inch long marsh bird with a long, down-curved beak. Both sexes are slate brown above, with light cinnamon underparts and barred flanks. The Yuma clapper rail is distinguished from other clapper rail subspecies using distributional data, plumage color, and wing configurations (Banks and Tomlinson 1974). The clapper rail is a secretive species and is not often seen in the wild. It does have a series of distinctive calls that are used to identify birds in the field. Frequency of calls or responsiveness to taped calls varies seasonally.

Habitat
Habitat for the clapper rail is freshwater and brackish marshes with dense vegetation, dominated by cattail (*Typha spp.*) that includes both mats of old material and more open stands. The most productive areas consist of uneven-aged stands of cattails interspersed with open water of variable depths (Conway *et al.* 1993). Other important factors in the suitability of habitat include the presence of vegetated edges between marshes and shrubby riparian vegetation (saltcedar or willow thickets) (Eddleman 1989), and the amount and rate of water level fluctuations within the habitat (Todd 1971; Tomlinson and Todd 1973). Clapper rails will use quiet backwater ponds, flowing stream or riverside areas, irrigation canals and drainage ditches, reservoirs and small lakes, or other small marshlands where cattail habitat is available. Natural and artificially constructed marshes can provide suitable habitat.

In Arizona, habitat studies determined that sites with high coverage by surface water, low stem density, and moderate water depth were used for foraging during the nesting season, while sites with high stem density and shallower water, near shorelines, were used for nesting (Conway 1990, Conway *et al*. 1993). Habitat used in early winter (November-December) is characterized by lower emergent stem density, basal coverage, and ground coverage; less distance to water; greater overhead coverage by vegetation, distance to adjacent uplands, distance to vegetation edges, water depth and water coverage; and taller emergent plants than randomly selected sites (Eddleman 1989, Conway *et al*. 1993).

Breeding
The breeding season for the clapper rail is from February though early July (Eddleman 1989). Nests are placed in dense vegetation near water's edge or, if available, on high sites within marshes; e.g. where banks are slightly higher than adjacent marshes (Zeiner *et al.* 1990).

Males begin advertising in February in Arizona and pair formation begins shortly afterward (Eddleman and Conway 1998). Nests were recorded in Arizona on March 13 (Eddleman 1989). Records from the University of California's Museum of Vertebrate Zoology and nest cards from the Cornell Laboratory of Ornithology indicate the mean date for first brood in southwestern Arizona and southeastern California is May 1 ± 24.8 days (Eddleman and Conway 1998). Mean clutch size is 6.8, ranging from 6 to 8 eggs (Eddleman 1989). In southwestern Arizona, egg

laying and caring for young begins in mid-March and occurs through early September (Eddleman and Conway 1998).

Eddleman (1989) measured nest diameters in Arizona ranging between 8.7-9.1 inches, nest depth ranging between 0-3.2 inches, and nest height between 2.5-36 inches. Nests were found in the base of living clumps of bulrush, cattail, or saltcedar, under wind-thrown bulrush, and within or on top of dead cattail remaining from previous years. Half of these nests lacked ramps (elevated entrances from substrate or water surface to nest rim) and all lacked canopies. Clapper rail nests were found near shore, in shallow water, and in marsh interiors over deep (>3.2 feet) water (Eddleman 1989, Conway *et al* 1993).

Diet

Non-native (introduced) crayfish (*Procamberus clarki*) form the primary prey base for clapper rails today (Todd 1986). Prior to the introduction of crayfish, isopods, aquatic and terrestrial insects, clams, plant seeds, and small fish dominated the diet. Ohmart and Tomlinson (1977) collected clapper rail specimens from Topock Marsh to Imperial Reservoir, the confluence of the Gila River and Colorado River, and the Colorado River Delta in Sonora, Mexico. Crayfish (*Procambarus clarki* and *Orconectes sp*.) were the dominant (95%) food item, followed by weevils (Curculionidae), unidentified beetles (Coleoptera), spiders, damselfly nymphs (Zygoptera), grasshoppers (Orthoptera), insect eggs, ground beetles (Carabidae), plant seeds, an unidentified mammal bone, and an introduced freshwater clam (*Corbicula sp*.), in rails from Topock Marsh to Imperial Reservoir. The rails at the confluence of the Gila River and the Colorado River were feeding upon *Corbicula* (50%), isopods (48.5%), and unidentified insects. Rails at the Colorado River Delta in Mexico were consuming water beetles (Hydrophilidae) (56.5%), unidentified fish (32%), leeches, plant matter (seeds and twigs), damselfly nymphs, dragonfly nymphs (Anisoptera), and shrimp (*Palaemonidae sp*.). Ohmart and Tomlinson (1977) observed that, despite a great abundance and variety of invertebrate food species available to the rails in the mangrove swamps, crabs (87% and 98%) were selected in preference to the other available foods. They concluded that, within the limits of their investigations, "Clapper Rails were selective, opportunistic, or limited in the variety of foods eaten depending upon habitat type."

Distribution, Abundance, and Status (Rangewide)

Once believed to be highly migratory (with most birds thought to spend the winter in Mexico), telemetry data showed most rails do not migrate (Eddleman 1989). Very little is known about the dispersal of adult or juvenile birds, but evidence of populations expanding northward along the LCR, the Salton Sea, and central Arizona over the last 80 years indicates that clapper rails can effectively disperse to new habitats provided that habitat corridors exist between the old and new sites. The availability of nearby habitats is important for individual birds to use as refuges when disturbances occur within their home range.

The clapper rail primarily inhabits salt marshes and mangrove swamps throughout its range; the Yuma clapper rail subspecies inhabits freshwater marshes in the southwestern United States and northern Mexico (Eddleman and Conway 1998, Hinojosa-Huerta *et al*. 2001). The clapper rail has two major population centers in the United States; the Salton Sea and surrounding wetlands in California, and the LCR marshes from the border with Mexico to Havasu National Wildlife

Refuge (Hinojosa-Huerta *et al* 2001, Wise-Gervais 2005). Smaller numbers of clapper rails are found along the lower Gila River in Yuma County, the Phoenix metropolitan area (including portions of the Gila, Salt and Verde rivers) in Maricopa County, Roosevelt Lake in Gila County, Picacho Reservoir in Pinal County, and the Bill Williams River in La Paz County, Arizona (Hinojosa-Huerta *et al* 2001, Wise-Gervais 2005, U.S. Fish and Wildlife Service annual survey data). Clapper rails have also recently been documented from southern Nevada in Clark County (McKernan and Braden 2000; Tomlinson and Micone 2000) and the Virgin River in Washington County, Utah and Mohave County, Arizona (McKernan and Braden 2000).

Annual survey data compiled by USFWS for the period 2000 through 2006 documented between 503 and 890 rails observed (via calls or visual observation) at the survey sites. Declines or increases in actual numbers heard or seen on survey transects have not been positively connected to any event on the LCR or Salton Sea; however, changes in habitat quality caused by overgrown marsh vegetation is suspected of influencing rail numbers in those areas. From 35 to 55% of the clapper rails detected in the United States annually are on the LCR. The unlisted clapper rail population in Mexico was estimated to contain 6,300 birds in the late 1990s (Hinojosa-Huerta *et al*. 2000 and 2003), and the amount of movement between the two populations is unknown. The stability of the Cienega de Santa Clara, Mexico, population is important for the subspecies as a whole because it is 2-6 times the United States population (U.S. Fish and Wildlife Service 2006).

Continuing threats

Concentrations of selenium in crayfish, the primary prey species for most populations, may be within the range that could cause adverse effects on reproduction (Eddleman 1989, King *et al*. 2000).

Fire during the breeding season (mid March to early September) can cause loss of eggs, young, and some adults (Todd 1986). After breeding, adults go through a prebasic molt, lose their tail and flight feathers, and remain flightless for 3 to 5 weeks (Eddleman and Conway 1998). This flightless period can occur through mid-September (Eddleman 1989) and fires during this time could severely impact rails.

Degradation of habitat is thought to be a factor contributing to declines in rail populations (Conway and Nadeau 2005). The lack of stochastic events that would scour and rejuvenate wetlands has allowed encroachment by woody vegetation and buildup of large amounts of decadent vegetation (Conway and Nadeau 2005). Clapper rails are threatened by river management activities that are detrimental to marsh formation, such as dredging, channelization, bank stabilization, and other flood control measures (Bureau of Reclamation 2004). Drying or drainage of managed wetlands can result in nest abandonment (Johnson and Dinsmore 1985, Bennet and Ohmart 1978 *in* Eddleman 1989). Conversely, rising water levels from dam operations force rails to higher grounds where they become predisposed to predation (Eddleman 1989). Prolonged higher water levels can cause abandonment of territories (Smith 1975).

The clapper rail populations in the United States remain small and little is known about their demographic stability. Protections for United States populations against habitat loss from river development actions have increased, as have conservation programs and management techniques to provide for habitat creation and maintenance over the long-term. However, the lack of

protection for the existing water source and subsequent habitat loss to the Cienega de Santa Clara population in Mexico remains a significant threat, and the continuing accumulation of selenium in the environment represents a currently unquantified risk to all clapper rail populations that may undermine other habitat improvements (U.S. Fish and Wildlife Service 2006).

Recovery Goals

According to the 1983 Recovery Plan, the Yuma clapper rail could be considered for delisting when 1) its breeding and wintering status in Mexico is clarified, 2) surveys for the species and its habitat are established, 3) management plans are developed for important Federal and State controlled breeding areas, and 4) written agreements are made with agencies having control or responsibility over Yuma clapper rail habitat in the United States and Mexico to protect sufficient wintering and breeding habitat to support a population of 700-1,000 breeding birds in the United States.

Effects of Federal Actions on the Species

Past Federal actions to construct dams, diversion structures, and other management actions have increased the amount and longevity of marsh habitats in several locations on the LCR. These same actions eliminate the variable physical conditions that provide for marsh regeneration, and habitat quality is reduced over time. Measures are in place under biological opinions issued for USBR's maintenance activities to reduce or eliminate adverse effects of current management on remaining marshes. Changes to water releases in the LCR are in part subject to USBR oversight and are also addressed for reduction of effects and replacement of lost habitat. Effects to the Salton Sea clapper rail habitats from changes in water flow to the Sea of Cortez that have a Federal nexus are being addressed under section 7 consultation.

Habitat conservation planning requires the USFWS to consult under section 7 prior to issuing a section 10 permit allowing take of species by non-Federal parties. Conservation for clapper rails at Roosevelt Lake and on the LCR is included in approved HCPs for those areas.

ENVIRONMENTAL BASELINE

The environmental baseline includes past and present impacts of all Federal, state, or private actions in the action area; the anticipated impacts of all proposed Federal actions in the action area that have undergone formal or early section 7 consultation; and the impact of state and private actions which are contemporaneous with the consultation process. The environmental baseline defines the current status of the species and its habitat in the action area to provide a platform from which to assess the effects of the action now under consultation.

Action Area

The "action area" means all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action. The action area is limited in extent to the floodplain of the LCR within the Limitrophe Division from the NIB to the SIB, and from the LCR levee west to the international boundary that follows the 1973 river channel (Appendix A). Land ownership in the action area is primarily BLM public land.

Southwestern willow flycatcher
Status of the species within the action area

The flycatcher was once abundant near the confluence of the Gila and Colorado rivers (T. Huels in litt., transcripts of H.Brown's 1902 field notes), but is now rare (McKernan and Braden 1999 and 2001; U.S. Fish and Wildlife Service 2002; Koronkiewicz 2004, 2005, 2006; McLeod 2007). No critical habitat has been designated for the flycatcher in or near the action area.

The action area has a documented history of use by flycatchers. Survey data (Tables 7-11) show recent results from annual surveys along the Colorado River in the vicinity of the action area. The lower Colorado River has been long recognized as an important migration corridor (Rosenberg *et al*. 1991). The southwestern subspecies of the willow flycatcher migrates earlier than the subspecies that breed farther north, and because studies do not begin until mid May on the LCR, the timing and number of migrant southwestern willow flycatchers moving through is unknown (Tom Koronkiewicz, SWCA, pers. comm.). Most birds detected in the Limitrophe over the past 15 years are believed to be migrants, but it is possible some birds detected after the spring migration period may have been residents. Survey results after mid June are generally negative, suggesting the birds do not stay to breed, but are rather using the river corridor to migrate to their breeding grounds elsewhere. Breeding has not been confirmed for any of these recently detected birds. The closest survey points in the Limitrophe Division proximal to the project area are Morelos Dam, Hunter's Hole, Gadsden, and Gadsden Bend. Within or near the Limitrophe in 2006, migrating flycatchers were documented from the confluence of the Gila River south to the SIB on or prior to June 15(McLeod *et al*. 2007). Koronkiewicz documented migrating willow flycatchers (identification only to species) being detected in the Gadsden-Hunter's Hole area in May-June, 2007, with 38 detections on June 3 at Hunter's Hole (SWCA unpubl.data). This represents the best information available about the presence of flycatchers in the action area.

During surveys in 1999, McKernan and Braden (2001) documented four birds at two sites in the action area and determined there were 19 acres of suitable breeding habitat present within an overall area of 45 acres. Most of the habitat burned in the fire during 2001 (approximately 40 acres). The habitat present until 2001 had developed in response to the 1993 high water event and conditions after the fire were less conducive to native riparian tree establishment due to a greater depth to the water table after the high flows subsided. Currently in the project area there are fewer acres of suitable breeding habitat, based on land cover types known to be used along the LCR (Bureau of Reclamation 2004).

The 1993 high water events flooded the action area and provided suitable conditions for recruitment of native cottonwoods and willows that developed into the suitable breeding habitat seen in 1999. Flows reached over 10,000 cfs in December 1998 and January 1999 (U.S. Geological Survey 2000) and may have assisted in the maintenance of the cottonwood-willow habitats. In general, moderate flood flows tend to irrigate and invigorate existing riparian stands; whereas very high flows (~30,000 cfs or greater) tend to scour out riparian vegetation. However, following scouring floods, conditions are often suitable for regeneration of cottonwood-willow and other native plant communities.

Brown-headed cowbirds occur all along the Limitrophe, are detected at flycatcher survey sites (McLeod 2007), and their numbers are subsidized by agricultural areas on both sides of the border. As no nesting flycatchers are known from the Limitrophe, brood parasitism is not known, but could become a problem if birds attempted to breed there.

Yuma Clapper Rail

Status of the species within the action area

Within the Limitrophe, available habitat for the clapper rail is patchily distributed. There are 54 acres of marsh habitat that could be used by this species in the action area. Most of this suitable marsh is along the river corridor between river miles 3 and 6, with the remainder at Hunter's Hole (near river mile 3). No suitable habitat would be treated. A 10-foot buffer would remain untreated around the marshes.

A significant record of survey and use data for the clapper rail exists for the action area. Table 12 shows survey results starting in 1979 for Hunter's Hole and continued on a rotational basis to the present date (L. Piest, Arizona Game and Fish Department, unpubl.data). Clapper rail numbers in the Limitrophe ranged from 0 to 17 during surveys conducted from 1995 through 2005 (U.S. Fish and Wildlife Service 2006). The Limitrophe is not surveyed every year. Surveys were completed in 1999 (no birds found), 2002 (three birds found) and 2005 (nine birds found). Due to security concerns, no surveys were conducted in 2006 or 2007 (Bureau of Land Management 2008). The birds found in 2005 were all in the river channel marshes.

Data compiled between 1995 and 2005 show that the Limitrophe clapper rails comprised from 0 to 2% of all the rails detected in the United States during those years (U.S. Fish and Wildlife Service 2006). Years of higher flows may tend to coincide with greater contributions to the clapper rail population, as the Limitrophe is normally a dry reach for most of its length (Bureau of Reclamation 1996) and the clapper rail is dependent on aquatic habitat. The nearest likely source population of these birds is outside of the action area in the Laguna Division, north of Yuma, which typically supports one to two orders of magnitude more detectable birds than the Limitrophe.

Large flood events occurred in 1983 and 1993 that changed the location of the river between the levees in the Limitrophe. Survey results show that habitat is readily colonized in this area after floods subside and habitat redevelops. Surveys in 2002 showed that the Hunter's Hole area was still used by clapper rails. In October 2007, most of the vegetation at Hunter's Hole was destroyed by fire. Although vegetation appears to be regenerating, it is unknown what the effects on clapper rails will be. This site was unoccupied in 2005. In 2005, AGFD surveyed between County 10th Street to Gadsden and found nine rails within the Limitrophe but outside the treatment area (Arizona Game and Fish Department, unpubl. data). Currently the Limitrophe has a variable capacity to support clapper rail habitat. The only water that enters the system is either unaccounted for or excess water that cannot be captured by the United States or Mexico. High water demand is dictating strict controls on the flows and releases by both countries, therefore conditions in the Limitrophe are less than desirable for the expansion of clapper rail habitat

Southwestern willow flycatcher and Yuma clapper rail
Factors affecting species environment within the action area

Environmental Setting
Appendix B provides a geographical reference, using River Miles, to the maps in Appendix A and features found along the Limitrophe of the LCR. For purposes of orientation, Hunter's Hole is at River Mile 2.4 and Gadsden is at River Mile 6.1. Much of the land between River Mile 6.5 and River Mile 17 is Cocopah Tribal land where no treatments are proposed. A levee on the east side of the floodplain, which protects USBR's Main Outlet Drain (M.O.D.E.) canal and adjacent farm fields, limits brush and dense tree development. Any effects to listed species and their habitat would occur west of the levee or downstream from vegetation treatment areas all the way to the SIB at River Mile 0.0. To the north, Morelos Dam, approximately one mile south of the NIB and at River Mile 22.1, is both a physical barrier, changing and limiting aquatic habitat development, and is the northern extent of the action area. To the west, the International Boundary runs roughly down the center of the 1973 Colorado River channel (Treaty of November 23, 1970, between United States and Mexico). This boundary roughly laterally bisects the floodplain of the Limitrophe Division.

Vegetation change
The biotic communities of the LCR have undergone dramatic changes and loss since the first dam was built in 1907 (Laguna Dam). The massive floods that regularly scoured, but then provided the conditions for, regeneration of riparian woodlands ceased with the completion of Hoover Dam in 1935 and Parker Dam in 1938. Introduction of saltcedar occurred about 1920, and this exotic tree thrived under the altered hydrological regime established by the series of LCR dams. The river was also contained by the geographical extent of high flows, and bankline structures, including jetties and low parallel "levees", that tend to contain lower flows and direct scouring and potentially damaging floods away from the levees. Flood control allowed for development of the river floodplain, and much of the historical floodplain has been converted to agriculture. The river and its floodplain now constitute one of the most highly managed waterways in North America (Ohmart *et al.* 1988).

Vegetation structure types for cottonwood-willow, saltcedar-honey mesquite, saltcedar, and arrowweed are described in Anderson and Ohmart (1984) and excerpted in Table 4. Field visits performed in 2007 documented a diverse mix of species within the action area including cottonwood (*Populus fremontii*), Goodding's willow (*Salix gooddingii*), coyote willow (*Salix exigua*), seep willow (*Baccharis emoryi*), honey mesquite (*Prosopis glandulosa* var. *torreyana*), screwbean mesquite (*Prosopis pubescens*), saltcedar (*Tamarix chinensis*), athel (*Tamarix aphylla*), and common reed (*Phragmites australis*) (Bureau of Land Management 2008). On drier sites are found a variety of growth forms including shrubs, grasses, and forbs such as arrowweed (*Pluchea sericea*), quailbush (*Atriplex lentiformis*), saltbush (*Atriplex canescens*), and creosote (*Larrea tridentata*).

Like many other riparian corridors in the Southwestern United States where water management actions have reduced the water table, the action area is dominated by non-native saltcedar. Native riparian habitat has declined and saltcedar has increased where the natural hydrograph has been altered and instream flows have been reduced. Yet, saltcedar provides habitat for many

riparian obligate wildlife species in the Limitrophe, including the endangered flycatcher, and is recognized as a valuable substitute where high salinity and lack of water no longer allow native woodland habitat to survive (U.S. Fish and Wildlife Service 2002). Saltcedar is often characterized as using more water than native riparian habitat, but several studies refute this claim and provide data that document water use roughly equivalent to native riparian habitat (Shafroth *et al.* 2005). However, because of its dense growth and resinous outer cambium, management agencies actively remove saltcedar to reduce fire risk. Two species of *Tamarix* occur in the Limitrophe – saltcedar and athel. The latter is evergreen, grows to a larger size, and is generally considered to be less invasive than saltcedar.

Terrestrial invasive plants within the action area include Sahara mustard (*Brassica tournefortii*), puncture vine (*Tribulus terrestris*), and Russian thistle (*Salsola spp.*). These plants often thrive in disturbed, loose sandy soils. Giant salvinia (*Salvinia molesta*), a noxious, non-native aquatic weed, is present within the open-water habitat of the proposed project area. This plant grows prolifically in slow moving, nutrient-rich waters and has been known to completely cover entire water bodies.

Despite water management constraints, conditions following the Gila River flood of 1992-93 facilitated natural regeneration of over 300 acres of cottonwood and willow habitat in the confluence area, indicating that future potential of habitat creation by flood events exist (Bureau of Reclamation 1999).

Morelos Diversion Dam

Morelos Diversion Dam, operated by Mexico under the US-Mexican Water Treaty of 1944, provides water for the Mexican canals, leaving little or no water flowing to the river downstream of the dam. The majority of river baseflow is diverted at Morelos Dam into the Alamo Canal in Baja California, Mexico. Periodic flood flows pass through Morelos Dam and on occasion invigorate or scour out the riparian habitats in the Limitrophe Division. Currently, water can flow past Morelos Diversion Dam under three circumstances; (1) Morelos Dam gate leakage (Bureau of Reclamation 2004); (2) as a result of over deliveries by the United States that Mexico is unable to divert at Morelos Diversion Dam; and (3) during flood flows on either the Gila River or along the mainstem Colorado River. Flows arriving at Morelos Dam normally range from about 750 to over 3,000 cfs during the year, but have exceeded 40,000 cfs in some flood events (Bureau of Reclamation 2004). As part of its normal water order Mexico typically diverts between 900–5,500 cfs at Morelos Dam (Bureau of Reclamation 2004). During those times that Mexico's water order is below 5,500 cfs, they can divert water arriving at Morelos Diversion Dam above their water order. During periods when only gate leakage contributes water past Morelos Dam, surface water is found for 3-4 miles downstream of the dam (Bureau of Reclamation 1996). From 2000 and 2004 no flows passed below Morelos Dam on more than 80% of the days in that period (Pacific Institute *et al*. 2007). USBR does not have control of Colorado River water once it is diverted at Morelos Dam. Thus, much of the Limitrophe's water and riparian vegetation is dependent a series of legally mandated diversions and withdrawals, designed to use and divert as much as possible before it gets into the action area (Bureau of Land Management 2008). There is apparently some subsurface flow, probably from high ground water in irrigated agriculture adjacent to the levee, as exhibited by wetland areas that have formed at Hunter's Hole in 2008 in areas that were dry in late 2007.

Most of the vegetation between the levees in the Limitrophe is within the riparian zone of the Colorado River. The lowest elevations of the river are generally open water, marsh, or undetermined vegetation. Marshland occurs surrounding the main channel of the river or in backwaters or low spots along the levees. Cottonwood and willow vegetation occurs in low side channels or along the river. A high bench near the levees is generally covered by solitary or mixed stands of quailbush (a saltbush), arrowweed, or creosote bush. The latter plant (creosote) is not a riparian species.

The present conditions in the action area have been influenced by past water management, channel dredging, vegetation clearing, and restoration projects. The current proposed action is an expansion of smaller vegetation removal projects conducted in 2007 to address safety and illegal immigration traffic.

Past Vegetation Treatments in Action Area
Some of the proposed treatment areas within the 600 foot corridor lie within locations that were previously treated under four different BLM hazardous fuels treatment projects. Due to current regrowth of up to three feet in these treatment locations and expected continued growth, these areas, when overlapping with this proposed action, would need the same initial mechanical treatment. The four recently completed vegetation treatment projects within the proposed vegetation treatment sites are listed below and shown in Appendix A.

- South Limitrophe Hazardous Fuels Reduction Project, Yuma County, Arizona. Approximately 257 acres in three different areas of xeric, scrubby saltcedar were treated for hazardous fuels reduction and safety. Consultation No. AESO/SE 22410-2007-I-0212.
    - March 6, 2007. Request for concurrence from BLM to USFWS.
    - March 14, 2007. Concurrence from USFWS to BLM concluding informal consultation.
    - March 29, 2007. Memorandum from BLM to USFWS on revised South Limitrophe Hazardous Fuel Reduction Project, Yuma County, Arizona.
    - April 5, 2007. Concurrence from USFWS to BLM concluding informal consultation for the revised South Limitrophe Hazardous Fuel Reduction Project.
- Hazardous Fuel Reduction and Emergency Safety Hazard Removal dated December 17, 2004. Action defined by Border Patrol as an emergency for safety of agents. Approximately 200 acres were treated. Consultation No. AESO/SE 02-21-05-I-0349.
    - April 12, 2005. Concurrence from USFWS to BLM concluding informal consultation.
- Hazardous Fuel Reduction and Emergency Safety Hazard Removal – supplemental to project described above, dated March 12, 2007. Approximately 210 acres were re-treated.

Consultation No. AESO/SE 22410-2007-I-0249.

- April 11, 2007. Request for concurrence from BLM to USFWS.

- April 12, 2007. Concurrence from USFWS to BLM concluding informal consultation.

- North Limitrophe Fuel Breaks dated January 18, 2006. Six fuel breaks of various lengths, which consisted of approximately two acres total with each fuel break measuring between 30 and 90 feet wide. Consultation No. AESO/SE 02-21-05-I-0817

Fire management
In June, 2001, a wildfire destroyed 40 acres of mostly cottonwood-willow community at Morelos Dam. Subsequently, the BLM revegetated approximately 17 acres with cottonwood and willow poles to mitigate for the loss of trees due to the fire. This revegetation had limited success (15%) largely because the depth to the water table was too deep across most of the area (Repass 2006). In 2005, BLM cleared a limited amount of vegetation in the action area as part of a program to create fire breaks in the Limitrophe and Yuma Divisions to assist in wildfire management. Three of these fire breaks are in the action area. The BLM fuel break project removed approximately one acre of vegetation within the action area from the total of two acres for the entire project. This was not a significant loss of riparian habitat, and may assist in controlling future wildfires.

Recently completed Section 7 consultations within Limitrophe
The following recently completed Section 7 consultations in or near the action area cover vegetation treatment, dredging, water storage, and water operation projects in or near the action area. These projects have reduced vegetation cover and water availability within the Limitrophe.

- Morelos Diversion Dam Channel Capacity Restoration Project Biological Opinion. Arizona Ecological Services Field Office, Phoenix. Consultation No. 22410-2006-F-0360. This project will clear 38.4 acres of brush and trees (U.S. Fish and Wildlife Service 2006).

- Lower Colorado River Drop 2 Storage Reservoir Project, Imperial County, California. 2007. USBR, Yuma Area Office. Arizona. Consultation conducted by California Ecological Services Field Office, Carlsbad. This project, proposed by USBR and Imperial Irrigation District, will provide additional water supply storage in a 450 acre reservoir at or near the All American Canal 25 miles west of Yuma (Bureau of Reclamation 2007). It would save approximately 70,000 acre-feet of Colorado River water per year from being released below Morelos Dam. This project also includes 6.5 miles of new canal to connect the Coachella Valley Canal to the reservoir and from the reservoir to the All-American Canal. The reduced flow is likely to exacerbate the already water-stressed riparian and wetland habitat along the river within the action area, potentially resulting in further decline in plant vigor, regeneration, and value to wildlife.

Vegetation clearing projects
Currently, the Border Patrol is working with county and local law enforcement entities and the Cocopah Tribe to clear dense vegetation from trouble spots between the NIB and SIB. Several such projects have been completed near San Luis, Gadsden Bend, County 13th Street, and County 14 ½ Street. Border Patrol and local entities are considering additional clearings to provide lines-of-sight for law enforcement personnel. The total number of acres cleared or planned for clearing is unknown, but the additive effect of these completed or ongoing projects is that the amount of shrub and tree vegetation available for breeding, feeding, sheltering, and migration will be substantially reduced.

Additional ongoing or planned border enforcement zone related projects
The following border related projects are in various stages of NEPA and ESA compliance (information provided by ACOE as the agent for CBP):

- Vegetation Clearing along the Colorado River. CBP is proposing to perform the same types of vegetation treatment along the LCR in the Limitrophe Division on lands not managed by BLM. The areas include lands within the Cocopah and Quechan nations as well as state and private lands. The entire area under consideration outside of BLM managed lands would be approximately 600 acres. Some of these areas are adjacent to this proposed action and, if implemented, will lengthen and widen the treated vegetation corridor along the LCR.
- Vehicle Fence. CBP is planning to construct approximately 13.5 miles of vehicle fence on the bankline structure parallel to the Colorado River between Gadsden and Morelos Dam in conjunction with current and future vegetation treatment. The vehicle fence would be placed adjacent to areas where vegetation treatments are proposed, and would require additional vegetation clearing. The vehicle fence is typically constructed of 4-6 foot high posts placed 4 feet apart with a cable, rail, or other type of cross member. While the vehicle fence acts as a barrier to vehicles, wildlife and pedestrians can easily pass through the barrier. It is anticipated that construction would begin in year 2008.

- Lighting. Stadium style lighting will illuminate a treated area of the on the top of the levee adjacent to the river corridor at the extreme southern end of the Limitrophe.

- Primary Pedestrian Fence. Primary pedestrian fencing has been completed along the levee road from San Luis north to 21 ½ Street. CBP is planning to construct approximately 3.6 miles additional of pedestrian fence proposed from the termination of existing fence at County 21 ½ Street north to Gadsden. This fence would be constructed on the top of the levee adjacent and parallel to the LCR corridor and would be of 15 to 18 foot high steel construction designed to impede pedestrian traffic and stop vehicular traffic. Unknown is whether these fencing and lighting projects will result in illegal traffic shifting farther north into new areas, where pedestrian fence is lacking. Whether or how much vegetation would be cleared to construct the fence is also unknown.

Native American use
The Colorado River corridor, including the Limitrophe, is a landscape of importance to Native Americans for traditional uses. A portion of the Cocopah Indian Tribe reservation is within the Limitrophe area, and there are several other Native American tribes and groups that are documented as having cultural ties to these lands. Tribal members are known to collect small amounts of traditional plant materials from the riparian zone for religious rites, cultural ceremonies, and other traditional uses, such as the collection of mesquite wood for funerary and construction purposes and the collection of willow for basket materials.

Overall, the future availability and condition of suitable habitat for the flycatcher in the action area is likely to decline over the term during which the proposed action would occur. No critical habitat has been designated for the flycatcher in or near the action area.

EFFECTS OF THE ACTION

Effects of the action refer to the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated and interdependent with that action that will be added to the environmental baseline. Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration. Indirect effects are those that are caused by the proposed action and are later in time, but are still reasonably certain to occur.

The previously treated acres that would be maintained through re-treatment within the 600 foot corridor under this proposed action are shown in Table 13. The last column indicates the acres that would be newly treated within the 600 foot corridor. Almost all of the cottonwood-willow habitat type will be newly treated and almost half of the combined 380 acres of saltcedar and saltcedar-mesquite habitat will be newly treated.

The Limitrophe, even with reduced flows and vegetation quality, is an important reach for wildlife on the LCR. In a comparison of bird densities upstream and downstream of Morelos Dam, which is the northern boundary of the action area, bird densities were estimated to be 10 times greater downstream than upstream (Hinojosa-Huerta 2006, Hinojosa-Huerta *et al.* 2006). The presence of standing water in the free-flowing portion was found to be a more important habitat factor than the presence of native vegetation. The Limitrophe provides habitat, especially for birds, that has largely disappeared from upstream river segments. Native trees make up about 10% of the flora downstream of Morelos Dam, compared to 1% upstream of Morelos Dam (Nagler *et al.* 2005). Large and small releases into the river downstream of Morelos Dam have recreated a semblance of a natural flow regime that has generated native trees in some areas of the Limitrophe. The northern segment of the Limitrophe, extending for approximately six miles below Morelos Dam, is very narrow (< 0.6 mi wide) and contains the highest proportion of native tree cover of any segment of the LCR, in either the United States or Mexico. Large (> 20 feet tall) willow and cottonwood trees constitute 18% of the vegetation in this segment. The southern segment is wider and less heavily vegetated, but still supports significant stands of trees in local areas (Glenn *et al.* 2007).

The proposed action would result in habitats of much reduced quality in the action area; however, those effects will be offset through establishment of riparian vegetation outside the treatment area but within or near the Limitrophe. Approximately 68.2 acres of cottonwood-willow habitat will be treated and replaced with 68.2 acres of cottonwood-willow habitat. Approximately 377.8 acres of saltcedar and saltcedar-mesquite habitat will be treated and replaced with 134-144 acres of cottonwood-willow and mesquite habitat. These habitats will be replaced with higher quality cottonwood-willow or mesquite habitats. Those potential restoration sites where willow flycatcher habitat can be created will be given a higher priority. Approximately 70.4 acres of arrowweed habitat will be thinned.

Southwestern Willow Flycatcher

Initial treatment of the action area will avoid the breeding seasons for the flycatcher (May – September) and most of the migration period. However, disruption to early migrants would occur in March, and when later migrants arrive, they will find much less habitat than in previous years. Shrub clearing, saltcedar removal, and tree pruning from the ground to up to eight feet in height would reduce the quality of existing suitable migratory and nesting flycatcher habitat. Subsequent maintenance and herbicide retreatment, which could be conducted year round within the action area, may occur during the migration and breeding seasons for the flycatcher. No flycatcher critical habitat occurs within the action area, thus none will be affected.

Direct effects to flycatchers could include survey and design teams marking the treatment areas and flushing of flycatchers by equipment or manual laborers during herbicidal maintenance or on-site revegetation activities. Whether maintenance or revegetation treatment activities would actually flush a flycatcher at any particular treatment location during the life of the project is uncertain, but within the realm of possibility

Although no known nesting pairs have been documented, migrants and birds of unknown status have been detected within the Limitrophe in recent years. Once initial vegetation treatment is completed, the treated areas (560.8 treated acres) will be unlikely to support breeding flycatchers in the future. Though willow trees would not be removed, trimming/pruning would likely cause them to be unsuitable for nesting flycatcher because most birds nest low in the canopy in dense, thickets (the opposite of trimmed and pruned). Approximately 68.2 acres in the cottonwood-willow type that would be pruned could provide for some use during migration, but not for nesting. However, flycatcher migration habitat will also be compromised. The lower Colorado River, especially within the Limitrophe, is a major migratory corridor for the flycatcher.

Incidence of fire in the Limitrophe is likely to decline with the treatments, and the threat to flycatcher mortality from fires will decline, as well. However, increased open areas and habitat edges in the action area could expose migrant flycatcher to additional predation, particularly from raptors specializing passerine prey. The likelihood of increased predation is unknown, and a result, incidental take due to increased predation is not reasonably certain to occur. Flycatchers could probably avoid cleared areas by traversing untreated patches in the United States or crossing the river into riparian stands in Mexico.

Following recent periodic large flood events, suitable habitat within the action area has developed and persisted for several years before gradually declining to its current state. The 1993 flood is one such event that created large expanses of suitable habitat that persisted for several years. Suitable habitat that would develop following future flood events would be precluded from developing through maintenance activities in the action area. Loss of this habitat reduces the geographical area where recovery of this species can occur within the Parker-Southerly International Boundary Management Unit.

To minimize this loss, habitat being compromised will be replaced with higher quality habitat offsite, but within or near the Limitrophe, using the habitat equivalent standards created by Anderson and Ohmart (1984). Revegetated habitat will be managed and protected for at least 10 years from the time it is planted. Approximately 68.2 acres of cottonwood-willow habitat treated will be replaced offsite with 68.2 acres of cottonwood-willow habitat. Approximately 377.8 acres of saltcedar or saltcedar-mesquite habitat will be replaced with 75.4 acres of mesquite 65.7 acres of cottonwood-willow habitat, or a combination of both. Approximately 70.4 acres of arrowweed habitat will be thinned. Restored habitat is likely to be a mosaic of cottonwood-willow and mesquite habitat. Sites that can support breeding flycatcher habitat are the highest priority for replacement habitat. They will be designed with the appropriate patch size and width, density of cottonwood and willow, canopy height, canopy closure, vertical foliar density, soil moisture, temperature, and humidity to support willow flycatchers. Flood irrigation may be required to grow and sustain replacement habitat. Once established, the restored habitats should provide higher quality and a greater acreage of potential breeding habitat than what is proposed for vegetation treatments. However, there will be a time lag of probably at least five or six years between when the treatments occur and when the restored habitats attain suitability, and the location of the restored habitats will be outside of and probably largely upstream of the treated areas.

Yuma Clapper Rail

No project activities will occur directly within clapper rail habitat. A 10-foot-wide no-treatment buffer will be placed around moist soils at the periphery of marshes, ponds, or active river channel to minimize disturbance when treatment occurs. With the exception of treatments in March 2008, initial vegetation treatments will occur outside of the rail breeding season (February though early July). Disturbance to individuals may occur from subsequent maintenance treatment activities in the form of short-term disruption of breeding or feeding activities. A maximum of 17 clapper rails have been detected in the action area since surveys began in 1995. This represents a small percentage (0% - 2%) of all Yuma clapper rails censused in the United States.

Incidence of fire and the associated threat to clapper rail mortality in the Limitrophe is likely to decline. Nest failure from fires during breeding season would diminish by an unquantifiable degree. In time, avian, reptilian, and mammalian predators will likely experience population adjustments due to the change in woody plant cover, structure, and habitat edges from the project. With a reduction of woody structure and cover, predators such as coyotes and hawks could increase in numbers or use of treated areas adjacent to clapper rail habitat. Conversely, reduction in structure and cover could result in declines of some predators such as skunk, raccoon, great horned owl, and kingsnake, thus reducing the potential for predation on clapper

rails. Though floods are infrequent in the Limitrophe, the proposed treatments would remove some of the channel and floodplain "roughness" that is a factor in slowing stream velocity and thus ameliorating flood flows. A loss in roughness can be assumed to increase velocity and the effects on channel morphology (Mutz 2000) and, thus, more vegetation loss through scouring. The marshland habitats of the clapper rail are in the lowest portions of the channel and would be the first areas to experience the effects of scouring floods. Affected adult or mobile, juvenile rails would likely relocate, but any nests, eggs, or nestlings would be lost. The last large floods in this area, in 1983 and 1993, changed the character of the Limitrophe channel and clapper rails recolonized within a few years of each event in concordance with resurgence of the disturbed vegetation. The degree to which the treatments would alter channel morphology and subsequently affect clapper rails and their habitat is unknown.

Fuels treatment projects undertaken in 2005 and April of 2007 would be maintained under this project and would have the same effects as maintenance of the proposed vegetation treatments for human health and safety. Law enforcement actions would be more easily undertaken and possibly fewer actions would be needed due to the exposed nature of the treatment areas, likely reducing the opportunity for clapper rail breeding, feeding, or sheltering activities to be disturbed by illegal activities or law enforcement response.

CUMULATIVE EFFECTS

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

Nonfederal activities in the action area are limited due to the size of the action area, the extent of Federal lands, and the number of Federal jurisdictions, resulting in a Federal nexus for most activities. County Sheriff law enforcement activities, undocumented immigration, drug smuggling, and hunting, primarily dove hunting, occur within the Limitrophe Division. An unknown acreage between the levee and the bankline structure is in agricultural production. Some of this is under BLM leases, but probably most is privately owned or on Cocopah tribal lands. Effects of agricultural activities on BLM leases are not cumulative; however, effects on private and Cocopah lands are, unless there is a Federal nexus. The Colorado River corridor, including the Limitrophe, is also of importance to Native Americans for traditional uses. A portion of the Cocopah Indian Tribe reservation is within the Limitrophe area, and there are several other Native American tribes and groups that are documented as having cultural ties to these lands. Tribal members are known to collect small amounts of traditional plant materials from the riparian zone for religious rites, cultural ceremonies, and other traditional uses, such as the collection of mesquite wood for funerary and construction purposes and the collection of willow for basket materials.

When taken together, these cumulative effects are expected to continue to reduce the quantity and quality of riparian and wetland habitats for the flycatcher and clapper rail as compared to the environmental baseline.

CONCLUSION

After reviewing the current status of the southwestern willow flycatcher and the Yuma clapper rail, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is our biological opinion that the Proposed Right-of-Way for the Vegetation Treatment Program in the Limitrophe Division for Safety and Law Enforcement, Lower Colorado River, Yuma County project, including the proposed conservation measures, is not likely to jeopardize the continued existence of the flycatcher or the clapper rail. Critical habitat for the flycatcher does not occur in the action area, therefore none will be affected. No critical habitat has been designated for the clapper rail, therefore none will be affected. We present these conclusions for the following reasons:

1) No known flycatcher nesting pairs and a maximum of four resident flycatchers have been documented within the Limitrophe since year 2000. This represents a very small percentage (< 1%) of all flycatchers surveyed in the United States (Durst *et al.* 2008).

2) Initial treatment of the action area will avoid the breeding season for the flycatcher (May - September).

3) No project activities will occur within clapper rail habitat. A 10-foot-wide no-treatment buffer will be placed around clapper rail habitat to minimize disturbance.

4) With the exception of treatments in March 2008, initial vegetation treatments will occur outside of the clapper rail breeding season (February though early July).

5) A maximum of 17 Yuma clapper rails have been detected in the action area since surveys began in 1995. This represents a very small percentage (0-2%) of all Yuma clapper rails censused in the United States (U.S. Fish and Wildlife Service 2006).

6) Replacement habitat will be a mix of 134-144 acres of higher quality cottonwood-willow and honey mesquite habitat types, with as much cottonwood and willow planted as the site can support (Table 5). Of the acres to be treated, the 68.2 acres of cottonwood-willow habitat will be replaced 1:1 with higher quality habitat. Replacement habitat will be within or near the Limitrophe. Successful replacement habitat would have the characteristics of CW II, CW III, CW IV, and HM III (Anderson and Ohmart 1984). CW II, CW III, and CW IV are the cottonwood-willow communities suitable for flycatcher nesting. Sites that can provide replacement habitat to support breeding willow flycatchers are of the greatest priority (Table B2 in Appendix B in BA). Where site conditions are appropriate, replacement habitat will be designed with the appropriate patch size and width, density of cottonwood and willow, canopy height, canopy closure, vertical foliar density, soil moisture, temperature, and humidity to support breeding willow flycatchers.

7) The proponent would be required to monitor and maintain the mitigation areas for a minimum of 10 years from the time of planting or until the trees are surviving on their own without maintenance.

8) Revegetated habitat will be monitored annually, with annual reports and work plans submitted to BLM and the USFWS.

The conclusions of this biological opinion are based on full implementation of the project as described in the Description of the Proposed Action section of this document, including any Conservation Measures that were incorporated into the project design.

INCIDENTAL TAKE STATEMENT

Section 9 of the ESA and Federal regulations pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined (50 CFR 17.3) to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined (50 CFR 17.3) as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. "Incidental take" is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the ESA provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

AMOUNT OR EXTENT OF TAKE

The USFWS does not anticipate the proposed action will result in incidental take of any flycatchers or clapper rails**.** Nesting flycatchers have not been found in the Limitrophe recently, although birds of unknown status have been detected. Marsh habitat surrounded by a 10-foot buffer will not be treated, minimizing the likelihood of take for clapper rails. Initial mechanical treatment activities would be undertaken during the season when flycatchers are absent and only during the early part of the breeding season for clapper rails.

A logical case can be made that incidental take may occur due to subsequent maintenance activities, but the likelihood is very low. Maintenance treatments could occur at any time of the year and equipment and personnel activities could disturb individuals within or at the edge of treatment areas during migration or breeding season of both species. Some potential breeding, feeding, and sheltering habitat for migrant and potentially breeding flycatchers would be affected, but the small amount of cottonwood, willow, and saltcedar vegetation to be treated is unlikely to reach the threshold of take. Predation risk could increase for both the flycatcher and the clapper rail due to treatments, but flycatchers could minimize that risk by migrating through untreated vegetation patches, and the likelihood of increased predation for either species does not rise to the level of reasonable certainty (see Effects of the Proposed Action). Similarly, clapper rails and their nests could be subjected to different and more extreme flooding regimes in the Limitrophe Division due to the proposed action, but the likelihood of incidental take does not rise to reasonable certainty.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

We recommend that the BLM consider the following recommendations:

1) Ensure the restoration habitat created will be maintained beyond the duration of the ROW Permit.

2) Conduct willow flycatcher and clapper rail surveys in suitable habitat within the project area and in any restored habitat according to established protocols (Sogge *et al.* 1997, Conway 2005).

3) Participate with the USFWS in the implementation of the Southwestern Willow Flycatcher Recovery Plan (U.S. Fish and Wildlife Service 2002) to achieve a recovery goal of 150 territories within the Parker-Southerly International Border Management Unit.

4) Assist in the implementation of the Yuma Clapper Rail Recovery Plan and recommendations in Five-year Review for the Yuma Clapper Rail (U.S. Fish and Wildlife Service 1983 and 2006).

5) Document abundance and subspecies identity of willow flycatchers to help assess the importance of the Colorado River corridor to southwestern willow flycatcher migration. Determine timing of spring and fall southwestern willow flycatcher migration through genetic and colorimeter comparisons of mist netted birds in the Parker-Southerly International Border Management Unit. The southwestern subspecies (*E. t. extimus*) may be moving through the Colorado River corridor earlier in the spring than the other subspecies.

6) If greater than 25% of the arrowweed vegetation type is selectively thinned, replacement habitat is recommended in proportion to the amount removed. The same method for calculating replacement habitat for saltcedar and saltcedar-honey mesquite vegetation treatment is recommended for arrowweed vegetation treatment (See Proposed "Mitigation" for BLM ROW Permit and Tables 3-5).

The number of acres of replacement habitat = (number of acres of the vegetation community type to be treated multiplied times the value of the community type to be treated in column two of Table 3) divided by the value in column two for the replacement habitat type for CW or HMIII

Example 1: (70.4 acres x 1) ÷ 20 = 3.5 acres of HM III. If 70.4 acres of arrowweed is removed, it equals 3.5 acres of replacement honey mesquite (HM III).

Example 2: (70.4 acres x 1) ÷ 23 = 3.1 acres of CW. If 70.4 acres of arrowweed is removed, it equals 3.1 acres of replacement CW.

In order for the USFWS to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, the USFWS requests notification of the implementation of any conservation recommendations.

REINITIATION NOTICE

This concludes formal consultation on the action(s) outlined in the request. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

The conservation measure to replace the treated vegetation has not been fully developed as of the date of this biological opinion. The effects of the action and our conclusions herein are based in part on full implementation the conservation measures. If the mitigation criteria and schedule developed as part of this consultation are not followed, this would constitute a modification to the proposed action. If this modification changes the effects of the action in a manner or extent not considered in this opinion, reinitiation of consultation would be required (50 CFR 402.16[c]).

The USFWS appreciates the BLM's efforts to identify and minimize effects to listed species from this project. For further information please contact Susan Sferra (602) 242-0210 (x208) or Jim Rorabaugh (520) 670-6155 (x230). Please refer to the consultation number, 22410-2008-F-0195, in future correspondence concerning this project.

Sincerely,

/s/
Steven L. Spangle
Field Supervisor

cc: Assistant Field Supervisor, U.S Fish and Wildlife Service, Tucson, AZ

Honorable Mike Jackson, Sr., President, Quechan Tribe, Yuma, AZ
Yuma County Sheriff's Office, Yuma, AZ
U.S. Army Corps of Engineers, Phoenix, AZ

Chief, Habitat Branch, Director, Arizona Game and Fish Department, Phoenix, AZ
Regional Supervisor, Arizona Game and Fish Department, Yuma, AZ
Field Manager, Bureau of USBR, Yuma, AZ
Commissioner, International Boundary and Water Commission, El Paso, TX
Honorable Sherry Cordova, Chairwoman, Cocopah Tribe, Somerton, AZ

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LITERATURE CITED

Anderson, B.W., and R.D. Ohmart. 1984. A vegetation management study for the enhancement of wildlife along the lower Colorado River. Final Report. Bureau of Reclamation. Lower Colorado Region. Boulder City, NV.

Banks, R.C. and R.E. Tomlinson. 1974. Taxonomic status of certain clapper rails of southwestern United States and northwestern Mexico. Wilson Bulletin. 86(4):325-335.

Bennett, W.W., and R.D. Ohmart. 1978. Habitat requirements and population characteristics of the Clapper Rail in the Imperial Valley, California. Unpubl. rep., Univ. Calif. Lawrence Livermore Lab, Livermore, California.

BIO-WEST. 2006. 2004 Lower Colorado Region vegetation type mapping, backwaters delineation, orthophotography, and GIS development. Prepared for Bureau of Reclamation, Boulder City, Nevada

Bureau of Land Management. 2008. Amended Biological Assessment and request for formal consultation and technical assistance, Right-of-Way in Limitrophe Division, Yuma County, Arizona. Phoenix, AZ

Bureau of Land Management. 2004. Arizona Statewide Land Use Plan Amendment for Fire, Fuels and Air Quality Management. Arizona State Office, Phoenix.

Bureau of Reclamation. 1996. Biological Assessment on operations, maintenance and sensitive species of the lower Colorado River . Appendices C and D. Lower Colorado Regional Office, Boulder City, Nevada.

Bureau of Reclamation. 1999. Long-term restoration program for the historical Southwestern Willow Flycatcher (*Empidonax traillii extimus*) habitat along the lower Colorado River. Lower Colorado Region, Boulder City, Nevada.

Bureau of Reclamation. 2004. Lower Colorado River Multi-Species Conservation Program. 2004. Volume II: Habitat Conservation Plan. Final. December 17. (J&S 00450.00) Sacramento, CA.

Bureau of Reclamation. 2007. Lower Colorado Drop 2 storage reservoir project. Imperial County, California. Final Environmental Assessment. Prepared by Science Applications International Corporation, Yuma Area Office, Yuma Arizona. Santa Barbara, California.

Cardinal S.N. and E. H. Paxton. 2005. Home range, movement, and habitat use of the southwestern willow flycatcher at Roosevelt Lake, AZ – 2004. U.S. Geological Survey Report to the Bureau of Reclamation, Phoenix, AZ.

Conway, C. J., W.R. Eddlemen, S.H. Anderson, and L.R. Hanebury. 1993. Seasonal changes in Yuma clapper rail vocalization rate and habitat use. J. Wildl. Manage. 56: 282-290.

Conway, C.J., and C.P. Nadeau. 2005. Effects of fire on Yuma clapper rails and California black rails, 2004 Annual Report. Wildlife Report Number 2005-01. Arizona Cooperative Fish and Wildlife Research Unit, Tucson, AZ. 14 p.

Conway, C.J. 2005. Standardized North American marsh bird monitoring protocols. Wildlife Research Report #2005-04. U.S. Geological Survey, Arizona Cooperative Fish and Wildlife Research Unit, Tucson, AZ.

Conway, C.J. 1990. Seasonal changes in movements and habitat use by three sympatric species of rails. M.S. thesis, Univ. of Wyoming, Laramie.

DeLay, L, D.M. Finch, S. Brantley, R. Fagerlund, M.D. Means and J.F. Kelley. 1999. Arthropods in native and exotic vegetation and their association with Willow Flycatchers and Wilson's Warblers. Pages 216-221 in Finch, D.M., J.C. Whitney, J.F. Kelley and S.R. Loftin (eds). Rio Grande ecosystems: linking land, water, and people. USDA Forest Service Rocky Mountain Research Station Proceedings RMRS-P-7.

DeLoach, C.J. 1991. Saltcedar, an exotic weed of western North American riparian areas: A review of its taxonomy, biology, harmful and beneficial values, and its potential for biological control. Report to the Bureau of Reclamation, Boulder City, Nevada, Contract No. 7-AG-30-04930.

Durst, S.L. 2004. Southwestern willow flycatcher potential prey base and diet in native and exotic habitat. Masters Thesis. Northern Arizona University, Flagstaff, AZ.

Durst, S.L., M.K. Sogge, S.D. Stump, S.O. Williams, B.E. Kus, and S.J. Sferra. 2007. Southwestern willow flycatcher breeding site and territory summary - 2006: USGS Open File Report 2007-1391

Eddleman, W.R. 1989. Biology of the Yuma clapper rail in the Southwestern U.S. and Northwestern Mexico. Report tot U.S. Fish and Wildlife Service and Bureau of Reclamation. Interagency Agreement 4-AA-30-02060. Wyoming Cooperative Research Unit, University of Wyoming, Laramie.

Eddleman, W.R., and C.J. Conway. 1998. Clapper rail (*Rallus longirostris yumanensis*). In The Birds of North America, No. 340 (A. Poole and F. Gill eds.) The Birds of North America, Inc., Philadelphia, PA.

Finch, D.M. and S.H. Stoleson, eds. 2000. Status, ecology, and conservation of the southwestern willow flycatcher. Gen. Tech. Rep. RMRS-GTR-60. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 131 p.

Glenn, E.P., K. Hucklebridge, O. Hinojosa-Huerta, P.L. Nagler, and J. Pitt. 2007. Reconciling environmental flood control goals on an arid-zone river: case study of the Limitrophe

Region of the lower Colorado River in the United States and Mexico. Environmental Management

Harris, J. H. 1991. Effects of brood parasitism by brown-headed cowbirds on willow flycatcher nesting success along the Kern River, CA. Western Birds 22:13-26.

Hinojosa-Huerta, O. 2006. Conservation of birds in the Colorado River Delta, Mexico. Dissertation for the University of Arizona, Tucson.

Hinojosa-Huerta, O., S. DeStefano, and W.W. Shaw. 2000. Abundance, distribution and habitat use of the Yuma clapper rail (*Rallus longirostris yumanensis*) in the Colorado River Delta, Mexico. Arizona Cooperative Fish and Wildlife Research Unit, University of Arizona, Tucson. 77 pp.

Hinojosa-Huerta, O., S. DeStefano, and W.W. Shaw. 2001. Distribution and abundance of the Yuma clapper rail (*Rallus longirostris yumanensis*) in the Colorado River delta, México. J. Arid Environments 49: 171-182.

Hinojosa-Huerta, O., J. Garcia-Hernandez, Y. Carillo-Guerrero, E. Zamora-Hernandez.. 2006. Hovering over the Alto Golfo: status and conservation of birds from the Rio Colorado to the Gran Desierto. In: Felger, R., R. Broyles (eds). Dry Borderlands: Great Natural Areas of the Gran Desierto and Upper Gulf of California. University of Utah Press, Salt Lake City, UT.

Hubbard, J.P. 1987. The status of the willow flycatcher in New Mexico. Endangered Species Program, New Mexico Department of Game and Fish, Sante Fe, NM. 29 pp.

Johnson, R. R., and J. J. Dinsmore. 1985. Broodrearing and postbreeding habitat use by Virginia Rails and Soras. Wilson Bull. 97: 551-554.

King, K. A., A. L. Velasco, J. Garcia-Hernandez, B. J. Zaun, J. Record, and J. Wesley. 2000. Contaminants in potential prey of the Yuma clapper rail: Arizona and California, USA, and Sonora and Baja, Mexico, 1998-1999. U.S. Fish and Wildlife Service, AZ. Eco. Ser. Field Off., Phoenix, AZ. 22 p.

Koronkiewicz, T J., M.A. McLeod, B.T. Brown, and S.W. Carothers. 2004. Southwestern willow flycatcher surveys, demography, and ecology along the lower Colorado River and tributaries, 2003. Annual report submitted to Bureau of Reclamation, Boulder City, NV by SWCA Environmental Consultants, Flagstaff, AZ. 125 pp.

Koronkiewicz, T.J., M.A. McLeod, BT. Brown, and S.W. Carothers. 2005. Southwestern willow flycatcher surveys, demography, and ecology along the lower Colorado River and tributaries, 2005. Draft annual report submitted to Bureau of Reclamation, Boulder City, NV. SWCA Environmental Consultants, Flagstaff, AZ. [p175]

Koronkiewicz, T.J., M.A. McLeod, B.T. Brown, and S.W. Carothers. 2006. Southwestern willow flycatcher surveys, demography, and ecology along the lower Colorado River and tributaries, 2005. Annual report submitted to Bureau of Reclamation, Boulder City, NV by SWCA Environmental Consultants, Flagstaff, AZ. 176 pp.

Maynard, W.R. 1995. Summary of 1994 survey efforts in New Mexico for southwestern willow flycatcher (*Empidonax traillii extimus*). Contract # 94-516-69. New Mexico Department of Game and Fish, Sante Fe, New Mexico. 48 pp.

McCarthey T.D., C.E. Paradzick, J.W. Rourke, M.W. Sumner, and R.F. Davidson. 1998. Arizona Partners in Flight, southwestern willow flycatcher survey: 1997 survey and nest monitoring report. Arizona Game and Fish Department Technical Report. Nongame Branch, Phoenix.

McKernan, R.L. and G. Braden. 1999. Status, distribution, and habitat affinities of the southwestern willow flycatcher along the lower Colorado River: Year 3 - 1998. Report to Bureau of Reclamation. San Bernardino County Museum. Redlands, CA. 71 pp.

McKernan, R.L. and G. Braden. 2001. Status, distribution, and habitat affinities of the southwestern willow flycatcher along the lower Colorado River. Year 4 - 1999. Report to Bureau of Reclamation. San Bernardino County Museum. San Bernardino County Museum, Redlands, CA..

McKernan, R.L. and G.T. Braden. 2000. The status of Yuma clapper rail and yellow-billed cuckoo along portions of Virgin River, Muddy River and Las Vegas Wash, Southern Nevada, 2000. Report from San Bernardino County Museum, Redlands, California to U.S. Fish and Wildlife Service, Southern Nevada Field Office, Las Vegas and Southern Nevada Water Authority, Las Vegas, NV. 20 pp.

McLeod, M.A., T.J. Koronkiewicz, B.T. Brown, and S.W. Carothers. 2005. Southwestern willow flycatcher surveys, demography, and ecology along the lower Colorado River and tributaries. Annual report to Bureau of Reclamation, Boulder City, NV, by SWCA Environmental Consultants, Flagstaff, AZ.

McLeod, M.A., T.J. Koronkiewicz, B.T. Brown, and S.W. Carothers. 2007. Southwestern willow flycatcher surveys, demography, and ecology along the Lower Colorado River and tributaries, 2006. Annual report submitted to Bureau of Reclamation, Boulder City, NV by SWCA Environmental Consultants, Flagstaff, AZ. 194 pp.

Moore, F.R., S.A. Gauthreaux Jr., and T.R. Simons. 1993. Stopover habitat: management implications and guidelines. Pp. 58-63. In: Finch, D.M. and P.W. Stengel (eds). Status and management of neotropical migratory birds. USDA Forest Service General Technical Report RM-299.

Mutz, M. 2000. Influences of woody debris on flow patterns and channel morphology in a low energy, sand-bed stream reach. International Review of Hydrobiology. 85(1):107-121.

Nagler, P., O. Hinojosa-Huerta, E. Glenn, J Garcia-Hernandez, R. Romo, C. Curtis, A. Huete, S. Nelson. 2005. Regeneration of native trees in the presence of invasive saltcedar in the Colorado River delta, Mexico. Conservation Biology 19:1842-1852.

Ohmart, R.D., B.W. Anderson, and W.C. Hunter. 1988. The ecology of the lower Colorado River from Davis Dam to the Mexico-United States international boundary: A community profile. U.S. Fish and Wildlife Service, Biological Report 85(7.19):1-296

Ohmart, R.D., and R.E. Tomlinson. 1977. Foods of western clapper rails. Wilson Bull. 89: 332-336.

Owen, J.C. and M.K. Sogge. 2002. Physiological condition of southwestern willow flycatchers in native and saltcedar habitats. U.S. Geological Survey report to the Arizona Department of Transportation.

Pacific Institute, Center for Biological Diversity, Defenders of Wildlife, Living Rivers, National Wildlife Federation, Sierra Club, and Yuma Audubon Society. 2007. February 15, 2007 Letter to Bureau of USBR. http://www.pacinst.org/topics/water_and_sustainability/colorado_river/what_would_plan_look_like.pdf

Paxton, E., J. Owen, and M.K. Sogge. 1996. Southwestern willow flycatcher response to catastrophic habitat loss. Colorado Plateau Research Station. U.S. Geological Survey Biological Resources Division. Northern Arizona University, Flagstaff, AZ. 12 pp.

Phillips, A.R. 1948. Geographic variation in *Empidonax traillii*. *The Auk* 65:507-514.

Phillips, A.R., J. Marshall, and G. Monson. 1964. The Birds of Arizona. University of Arizona Press, Tucson, Arizona. 212 pp.

Piest, L. 2006. Report of marsh bird surveys conducted by Arizona Game and Fish Department, Region 4, 2006. Arizona Game and Fish Department unpublished report. 12 pp.

Pollard, E. 1977. A method for assessing changes in the abundance of butterflies. Biological Conservation. 12:115-134.

Repass, D. 2006. Morelos Dam Fire. Email to Lesley Fitzpatrick, USFWS from Yuma Field Office, Bureau of Land Management, Yuma, Arizona.

Roberts, C.L. 1996. Trace element and organochlorine contamination in prey and habitat of the Yuma clapper rail in the Imperial Valley, California. U.S. Fish and Wildlife Service, Carlsbad Field Office, Carlsbad, California. 24 pp.

Rosenberg, K.V., R.D. Ohmart, W.C. Hunter, and B.W. Anderson. 1991. Birds of the Lower Colorado River valley. University of Arizona Press, Tucson. 416 pp.

Rothstein, S.I., B.E. Kus, M. J. Whitfield and S.J. Sferra. 2003. Recommendations for cowbird management in recovery efforts for the Southwestern Willow Flycatcher. pp. 157-167 *In*: Ecology and Conservation of the Willow Flycatcher (M.K. Sogge, BA. Kus, S.J. Sferra, M.J. Whitfield eds.). Studies in Avian Biology. No. 26.

San Diego Natural History Museum. 1995. *Empidonax traillii extimus* in California. The willow flycatcher workshop. 17 November 1995. 66 pp.

Sferra, S.J., R.A. Meyer, and T.E. Corman. 1995. Arizona Partners in Flight 1994 southwestern willow flycatcher survey. Final Technical Report 69. Arizona Game and Fish Department, Nongame and Endangered Wildlife Program, Phoenix, Arizona. 46 pp.

Sferra, S.J., T.E. Corman, C.E. Paradzick, J.W. Rourke, J.A. Spencer, and M.W. Sumner. 1997. Arizona Partners in Flight southwestern willow flycatcher survey: 1993-1996 summary report. Arizona Game and Fish Department Technical Report 113. 104 pp.

Shafroth, P.B., Cleverly, J.R., Dudley, T.L., Stuart, J., Taylor, J.P., van Riper, C., and Weeks, E.P., 2005, Control of Tamarix in the western U.S. - Implications for water salvage, wildlife use, and riparian restoration: Environmental Management, v. 35, p. 231-246. Stromberg, J.C., 2001, Restoration

Smith, P. M. 1975. Habitat requirements and observations of the Yuma clapper rail. M.S. thesis, Univ. of Arizona, Tucson.

Sogge, M. K., E.H. Paxton, and A.A. Tudor. 2005. Saltcedar and southwestern willow flycatchers: lessons from long-term studies in central. .*In*: Aguirre-Bravo, Celedonio, et. al. Eds. 2004. Monitoring Science and Technology Symposium: Unifying knowledge for sustainability in the Western Hemisphere; 2004 September 20-24; Denver, CO. Proceedings RMRS-P-37-CD. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.

Sogge, M.K., R. Marshall, S. Sferra, and T. Tibbitts. 1997. A Southwestern willow flycatcher natural history summary and survey protocol. National Park Service. Technical Report NPS/NAUCPRS/NRTR-97/12. 37 pp.

Spencer, J A., S.J. Sferra, T.E. Corman, J.W. Rourke, and M.W. Sumner. 1996. Arizona Partners In Flight 1995 southwestern willow flycatcher survey. Technical Report 97, March 1996. Arizona Game and Fish Department, Phoenix. 69 pp.

Todd, R.L. 1986. A saltwater marsh hen in Arizona: A history of the Yuma clapper rail (*Rallus longirostris yumanensis*). Completion Report. Arizona Game and Fish Department, Federal Aid Project W-95-R. Phoenix. 290 p.

Todd, R.L. 1971. Report on the study of the Yuma clapper rail along the Colorado River. Unpublished report for the Colorado River Wildlife Council Meeting, April 5-6, 1971 at Las Vegas, Nevada. 16 pp.

Tomlinson, C.R. and K. Micone. 2000. Breeding status of the southwestern willow flycatcher and initial surveys for the Yuma clapper rail at various sites in southern Nevada. Program Activities Report, January 1, 1999 through December 31, 1999. Nevada Division of Wildlife, Las Vegas. 20 pp.

Tomlinson, R.E. and R.L. Todd. 1973. Distribution of two western clapper rail races as determined by responses to taped calls. Condor. 75(2):177-183.

Unitt, P. 1987. *Empidonax traillii extimus*: An endangered subspecies. *Western Birds* 18:137-162.

U.S. Fish and Wildlife Service. 2005. Designation of Critical Habitat for the Southwestern Willow Flycatcher: Final Rule. *Federal Register* 70 (201): 60886.

U.S. Fish and Wildlife Service. 1997a. Final determination of critical habitat for the southwestern willow flycatcher. *Federal Register* 62(140):39129-39146.

U.S. Fish and Wildlife Service. 1997b. Correction; final determination of critical habitat for the southwestern willow flycatcher. *Federal Register* 62 (161): 44228.

U.S. Fish and Wildlife Service. 1995. Final rule determining endangered status for the southwestern willow flycatcher. *Federal Register* 60:10694-10715.

U.S. Fish and Wildlife Service. 2006. Five-year review for the Yuma clapper rail (*Rallus longirostris yumanensis*). USFWS-Arizona Ecological Services Office, Phoenix, AZ

U.S. Fish and Wildlife Service. 2000. Southwestern Willow Flycatcher protocol revision Correction; final determination of critical habitat for the southwestern willow flycatcher. *Federal Register* 62 (161): 44228.

U.S. Fish and Wildlife Service. 2002. Southwestern Willow Flycatcher Recovery Plan. Albuquerque, New Mexico. i-ix + 210 pp., Appendix E.

U.S. Fish and Wildlife Service. 1983. Yuma Clapper Rail Recovery Plan. Albuquerque, New Mexico. 51 pp.

U.S. Geological Survey. 2000. Water Resources Data Arizona, Water Year 1999. Water Data Report AZ-99-1. USGS, Tucson, Arizona.

U.S. International Boundary and Water Commission. 2001. Morelos Dam Channel Capacity Restoration Plan. Provided to U.S. Fish and Wildlife Service with initial request for informal consultation on July 31, 2001. USIBWC, El Paso, Texas.

Wise-Gervais, C. 2005. Clapper Rail (*Rallus longrirostris*). *In* Arizona Breeding Bird Atlas (T. E. Corman and C. Wise-Gervais, eds.). Univ. of New Mexico Press, Albuquerque, NM. 636 p.

Yong, W. and D.M. Finch. 1997. Migration of the willow flycatcher along the Middle Rio Grande. Wilson Bulletin 109:253-268.

Zeiner, D.C., W.F. Laudenslayer and K.E. Meyer. 1990. California's Wildlife Volume II: Birds. State of California Department of Fish and Game.

Table 1. Description of vegetation types in project area along Lower Colorado River, Arizona (Anderson and Ohmart 1984).

Vegetation type	Description
Cottonwood-willow (CW)	*Salix gooddingii* and *Populus fremontii* (the latter in extremely low densities), constituting at least 10% of total trees.
Saltcedar-honey mesquite (SH)	*Prosopis glandulosa* constituting at least 10% total trees: rarely found constituting greater than 40% of total trees.
Saltcedar (SC)	*Tamarix chinensis* constituting 80 - 100% of total trees
Arrowweed (AW)	*Tessaria sericea* constituting 90 -100% of total vegetation in area

Table 2. Vegetation types, prescriptions, and proposed treatment acres. Vegetation types are based on a 2004 vegetation survey of the Limitrophe, which delineated both plant community and structure type classification according to Anderson and Ohmart (1984) (BIO-WEST 2006). The following acres were calculated using Geologic Information System.

Vegetation Type	Vegetation Treatment Prescription	Acres Proposed for Treatment
Arrowweed (including creosote, saltbush)	Prescription C, D	70.4
Cottonwood/Willow	Prescription B	68.2
Marsh	None	0
Open Water	None	0
Saltcedar	Prescription A	329.9
Saltcedar/Mesquite (determined to be 95% saltcedar, 5 % mesquite)	Prescription A, B, C	47.9
Structured Open Water	None	0
Undetermined (Undetermined includes saltcedar, creosote, saltbush, roads, and open ground)	Prescription C	44.4
All	Total Acres	560.8

Table 3. Wildlife habitat value for habitat types found in project area based on vegetation classification developed by Anderson and Ohmart (1984) for the Lower Colorado River Valley. CW = cottonwood-willow, HM = honey mesquite, SC = saltcedar, SH = saltcedar-honey mesquite, AW = arrowweed.

Habitat Type	Habitat Value Average number of wildlife categories ranking in top three	Contribution by CW or HM	Trees/acre of CW or HM (0.4 ha)
CW I	17	17	146
CW II	23	23	87
CW III	26	21	83
CW IV	19	12	29
CW V	5	0	17
CW VI	6	0	2
SC I	4	0	0
SC II	8	0	0
SC III	5	0	0
SC IV	3	0	0
SC V	5	0	0
SC VI	7	0	0
SH IV	8	1	35
AW VI	1	0	0
HM III	20	20	93
HM IV	21	12	31
HM V	10	1	12
HM VI	9	0	9

Table 4. Description of vegetation structure types along lower Colorado River, Arizona (Anderson and Ohmart 1984).

Structure Type	Description
I	45% of stand in overstory (>15 ft); 30% in intermediate story (2-15 ft); 10% in understory (< 2 ft).
II	60% of stand in overstory (>15 ft); 30% in intermediate story (2-15 ft); 10% in understory (< 2 ft).
III	25% of stand in overstory (> 15 ft); 50% in intermediate story (2-15 ft); 25% in understory (< 2 ft).
IV	15% of stand in overstory (> 15 ft); 45% in intermediate story (2-15 ft); 40% in understory (< 2 ft).
V	5% of stand in overstory (>15 ft); 35% in intermediate story (2-15 ft); 60% in understory (< 2 ft).

Table 5. Mitigation for habitat type treated in the Limitrophe area. Wildlife values of habitat types for treated and replacement habitat are based on Table 13-2, p. 503 - 504 in Appendix 13.1 (Anderson and Ohmart 1984). See Table 3 above for wildlife values by habitat type.	
Habitat Type Treated	Mitigation Proposed
CW I, CW II, CW III, CW, IV	For every acre treated, 1 acre will be restored offsite of the treatment area with CW habitat types that qualify as suitable willow flycatcher breeding habitat. As habitat develops, it is likely to succeed from CW VI through CW II or I over time. 68.2 acres to be treated and replaced
SC and SH	The number of replacement acres can be calculated by using the following formula for a different habitat of equal value. The number of acres of replacement habitat = (number of acres of the vegetation community type to be treated multiplied times the value of the community type to be treated in column two of Table 3) divided by the value in column two of Table 3 for the replacement community type. For SC and SH habitat types to be treated, the value "4" is used based on the acreages BLM calculated for the actual structure types mapped in 2004. Structure type III and a value of "20" is used for HM habitat types because it is identified as the goal for HM habitat types in Anderson and Ohmart (1984). For CW replacement habitat, the value "23" is used because it is the median for the structure types used by flycatchers (CW II, CW III, CW IV) and the goal of the replacement habitat. A total of 377.8 acres of SC and HM will be treated, which results in the following habitat replacement formulas: (377.8 acres x 4) ÷ 23 = 65.7 acres of CW or (377.8 acres x 4) ÷ 20 = 75.4 acres of HM III Ideally, restoration would be a mix of these types, with as much CW planted as the site can support. Higher priority sites are those where wet soil conditions can be created on at least part of the restoration site for willow flycatcher habitat.
AW	70.4 treated. No replacement habitat.
Undetermined	44.4 treated. No replacement habitat.
TOTALS	***560.8 acres treated, 134-144 acres revegetated***

Table 6. Schedule of tasks for evaluating, creating, and maintaining replacement habitat.	
Task	Schedule
Identify sites, conduct site visits, prepare site reports	Within 3 months for first revegetation site, within 12 months for all revegetation sites
Submit site assessments and cost estimates	Within 3 months for first revegetation site, within 12 months for all sites
Submit habitat creation opportunity rating	Within 3 months for first revegetation site, within 12 months for all revegetation sites
Complete environmental compliance, if necessary	Within 6 months for first revegetation site, within 18 months for all revegetaion sites
Submit mitigation and monitoring plan	Within 6 months for first revegetation site, within 18 months for all revegetaion sites
Implement mitigation plan (site preparation, and planting vegetation, maintenance)	Begin within 12 months for first revegetation site, within 24 months for all revegetaion sites
Annually monitor mitigation sites to ensure plantings are progressing to desired habitat conditions until mitigation obligation is complete	As per monitoring plan and established protocols
Submit annual report and work plan	September 30 annually
Submit final report	Within 180 days of completion of project

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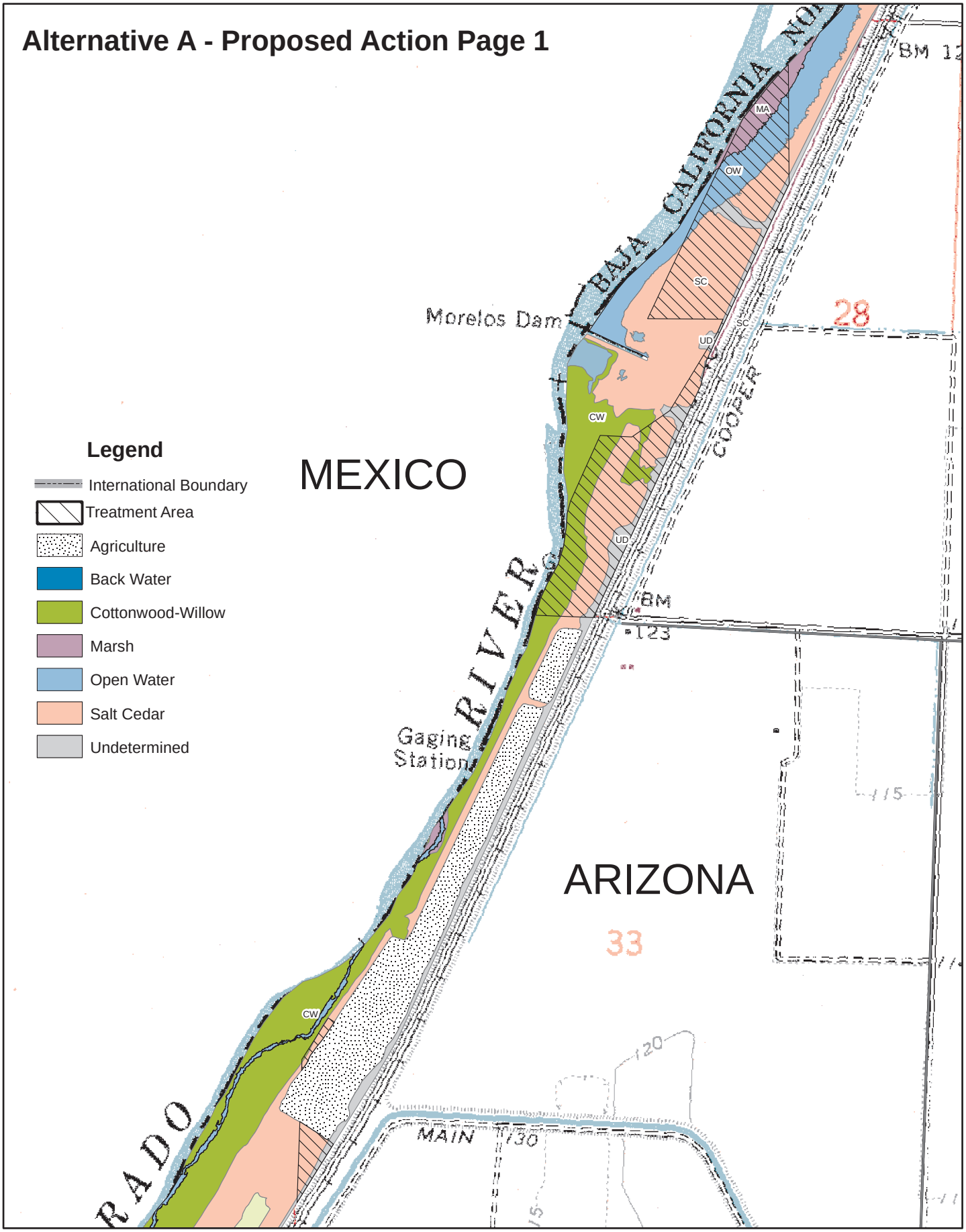


Table 7. Migratory willow flycatcher detections for County 11th to 12th (compiled by Arizona Game and Fish Department, summarized by Jim Rorabaugh, USFWS, Arizona Ecological Services). Subspecies unknown.

Year	Survey Status	Number Flycatchers Detected by Date	Breeding?
2006	No Surveys	No Data	No Data
2005	No Surveys	No Data	No Data
2004	No Surveys	No Data	No Data
2003	Surveyed	1 (May 31)	No
2002	Surveyed	0	No
2001	Surveyed	1 (May 23)	No
2000	Surveyed	2 (May 30)	No

Table 8. Migratory willow flycatcher detections for County 12th to 13th (compiled by Arizona Game and Fish Department, summarized by Jim Rorabaugh, USFWS, Arizona Ecological Services). Subspecies unknown.

Year	Survey Status	Number Flycatcher Detected by Date	Breeding?
2006	No Surveys	No Data	No Data
2005	No Surveys	No Data	No Data
2004	No Surveys	No Data	No Data
2003	Surveyed	2 (May 31)	No
2002	Surveyed	1 (May 29)	No
2001	Surveyed	4 (May 23)	No
2000	Surveyed	1 (May 30)	No

Table 9. Migratory willow flycatcher detections for Gadsden Bend (compiled by Arizona Game and Fish Department, summarized by Jim Rorabaugh, USFWS, Arizona Ecological Services, and modified with 2006 data from McLeod *et al.* [2007]). Subspecies unknown.

Year	Survey Status	Number Flycatcher Detected by Date	Breeding?
2006	Surveyed	4, 24, 2, 3, 1 (May 15 - June 15)	No
2005	Surveyed	6, 2, 2, 1, 1 ,3, 2, 3 (May 17- June 17)	No
2004	Surveyed	8, 8, 1, 2, 1, 1 (May 18 – July 23)	One bird detected 23 July could have been an early south-bound migrant or a breeding bird.
2003	Surveyed	9, 8, 4, 4, 2 (May 18 – June 17)	No
2002	Surveyed	2, 6, 5, 4, 2 (May 20 – June 19)	No
2001	Surveyed	1, 3, 5, 5, 3 (May 21 – June 15)	No
2000	No Surveys	No Data	No Data

Table 10. Migratory willow flycatcher detections for Gadsden Pond (compiled by Arizona Game and Fish Department, summarized by Jim Rorabaugh, USFWS, Arizona Ecological Services and modified with 2006 data from McLeod *et al.* [2007]). Subspecies unknown.

Year	Survey Status	Number Flycatchers Detected by Date	Breeding?
2006	Surveyed	9, 19, 7, 2, 11, 2 (May 15 – June 15)	No
2005	Surveyed	7, 7, 1, 2, 2 (May 17- June 12)	No
2004	Surveyed	4, 22, 3 (May 18 – June 9)	No
2003	Surveyed	25, 2, 3 (May 19 - June 16)	No
2002	No Surveys	No Data	No Data
2001	No Surveys	No Data	No Data
2000	Surveyed	6, 3, 2, 3, 5 (May 22 – June 6)	No

Table 11. Migratory willow flycatcher detections for Hunter's Hole (compiled by Arizona Game and Fish Department, summarized by Jim Rorabaugh, USFWS, Arizona Ecological Services and modified with 2006 data from McLeod *et al.* [2007]). Subspecies unknown.

Year	Survey Status	Number Flycatchers Detected by Date	Breeding?
2006	Surveyed	10, 11, 1, 26, 1 (May 13 - June 15)	No
2005	Surveyed	6, 2, 1, 2, 1 (May 18- June 17)	No
2004	Surveyed	5, 37 ,4 (May 18 - June 9)	No
2003	Surveyed	16, 1, 8, 2, 1, 2 (May 18 - June 16)	No
2002	Surveyed	2, 4, 4, 2 (May 20 – June 12)	No
2001	Surveyed	4, 5, 5, 3 (May 22 – June 15)	No
2000	Surveyed	2, 2, 3, 2 (May 23 – June 14)	No

Table 12. Yuma clapper rail survey results from the lower Colorado River near Yuma, Arizona (Lin Piest, Arizona Game and Fish Department, unpubl. data 2006).

Year	79	80	81	82	83	84	85	86	87	88	89	90	91	92
Hunter's Hole			3	11	1	3	6				3	2	1	2
Other			0		4								6	25
Total			3	11	5	3	6				3	2	7	27

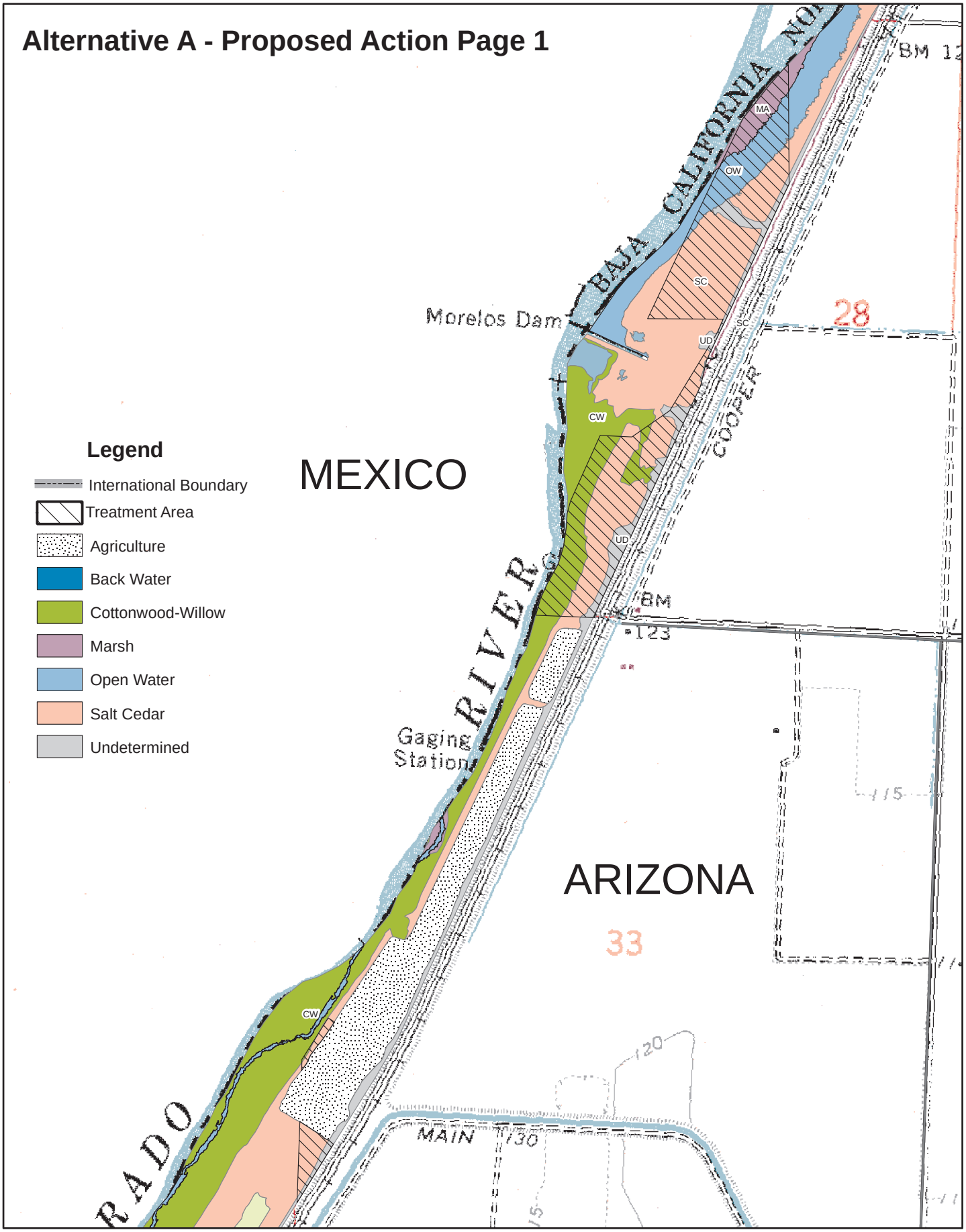
Year	93	94	95	96	97	98	99	00	01	02	03	04	05	06
Hunter's Hole	5	3	3	5	4		0			3			0	0
Other	8	0	1	12	2		0			0			9	0
Total	13	3	4	17	6		0			3			9	0

Table 13. Acres in action area by vegetation type, proposed action, and previously treated acres.

Vegetation Type	Total Acres in Action Area (all ownerships)	Acres of Public Land Proposed for Treatment (600 ft. Strip)	Previously Treated Acres of Public Land Within 600 ft. Strip to be Re-treated	Remaining Acreage of Public Land Within 600 ft. Strip to be Newly Treated
Agriculture	214.5	0.0	0.0	0.0
Arrowweed	179.5	70.4	22.3	48.1
Cottonwood-Willow	264.7	68.2	2.9	65.3
Marsh	53.8	0.0	0.0	0.0
Open Water	64.6	0.0	0.0	0.0
Saltcedar	2,554.9	329.9	162.3	167.6
Saltcedar-Mesquite	62.4	47.9	37.1	10.8
Undetermined	140.9	44.4	17.6	26.8
Total	3,535.3	560.8	242.2	318.6

Appendix B. River miles and locations, cross-referenced to maps. Source: USBR. (R) indicates River Right facing downstream, (L) indicates River Left facing downstream.	
River Miles	Location
0.0	Southerly International Boundary (L)
0.2	Stream gage, IBWC- 09522200, Colorado River at Southerly International Boundary near San Luis, Arizona (R)
2.4	Outlet of Hunter's Hole and Twenty-One Mile Mile Wasteway (L)
6.1	Gadsden, Arizona (L)
21.6	Cooper Wasteway (old location) (L)
22.0	Main Outlet Drain-M.O.D.E. No. 3 (L)
22.1	Morelos Dam; Alamo Canal (R)
22.7	Cooper Wasteway (new location) (L)
23.1	Stream Gage, IBWC- 09522000, Colorado River at Northerly International Boundary above Morelos Dam, near Andrade, California (L); Northerly International Boundary (R)

Alternative A - Proposed Action Page 1



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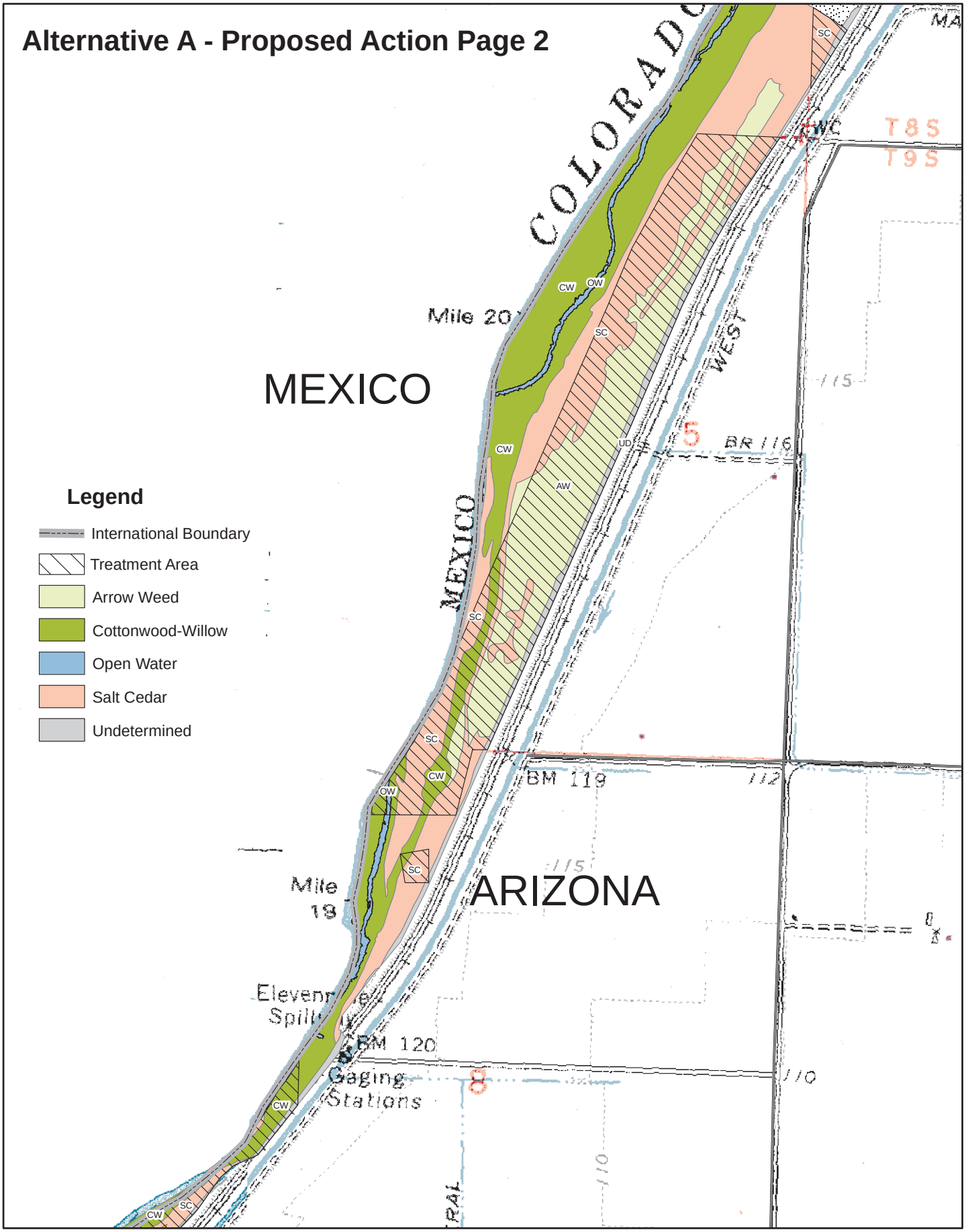

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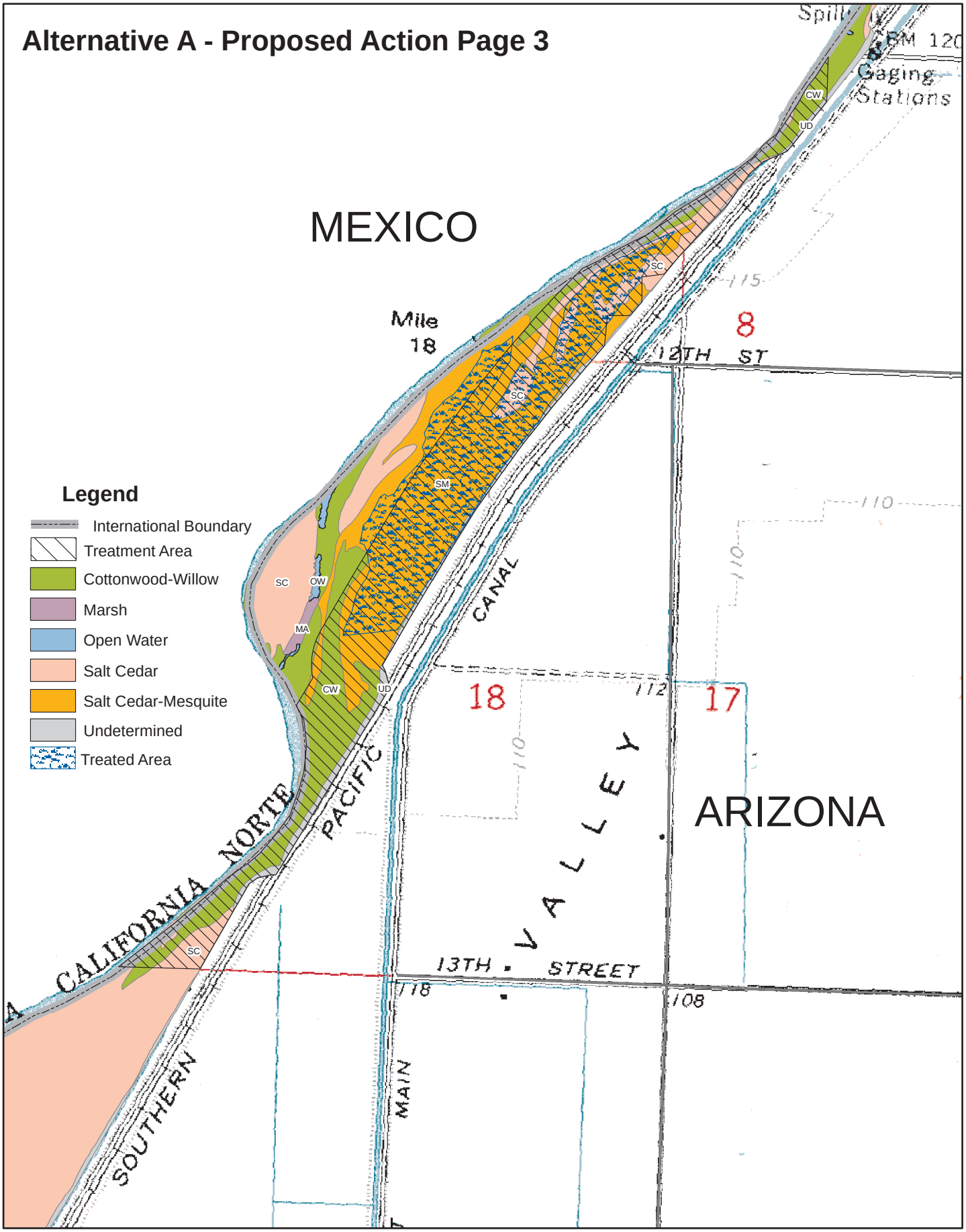

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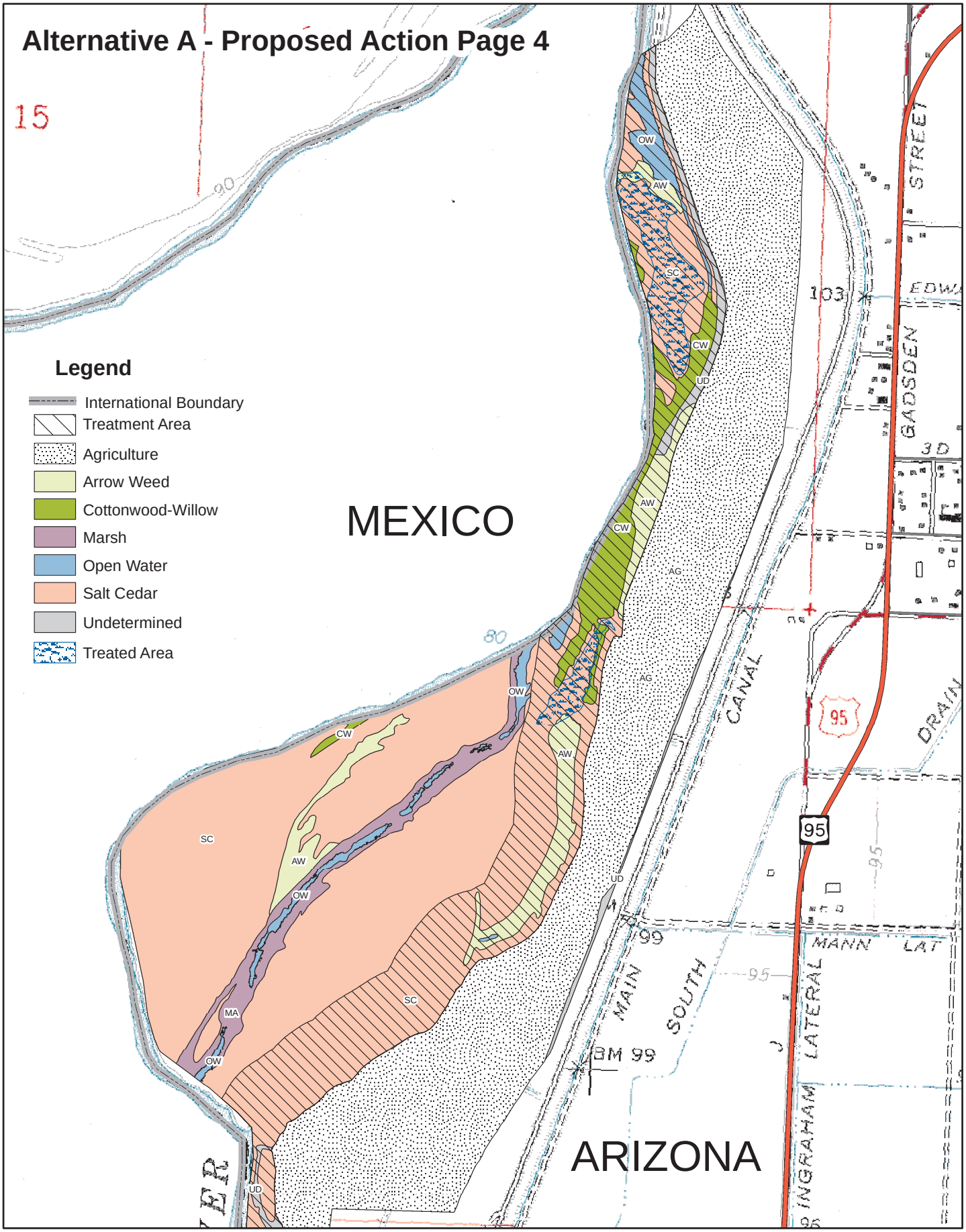
Miles

Alternative A - Proposed Action Page 4



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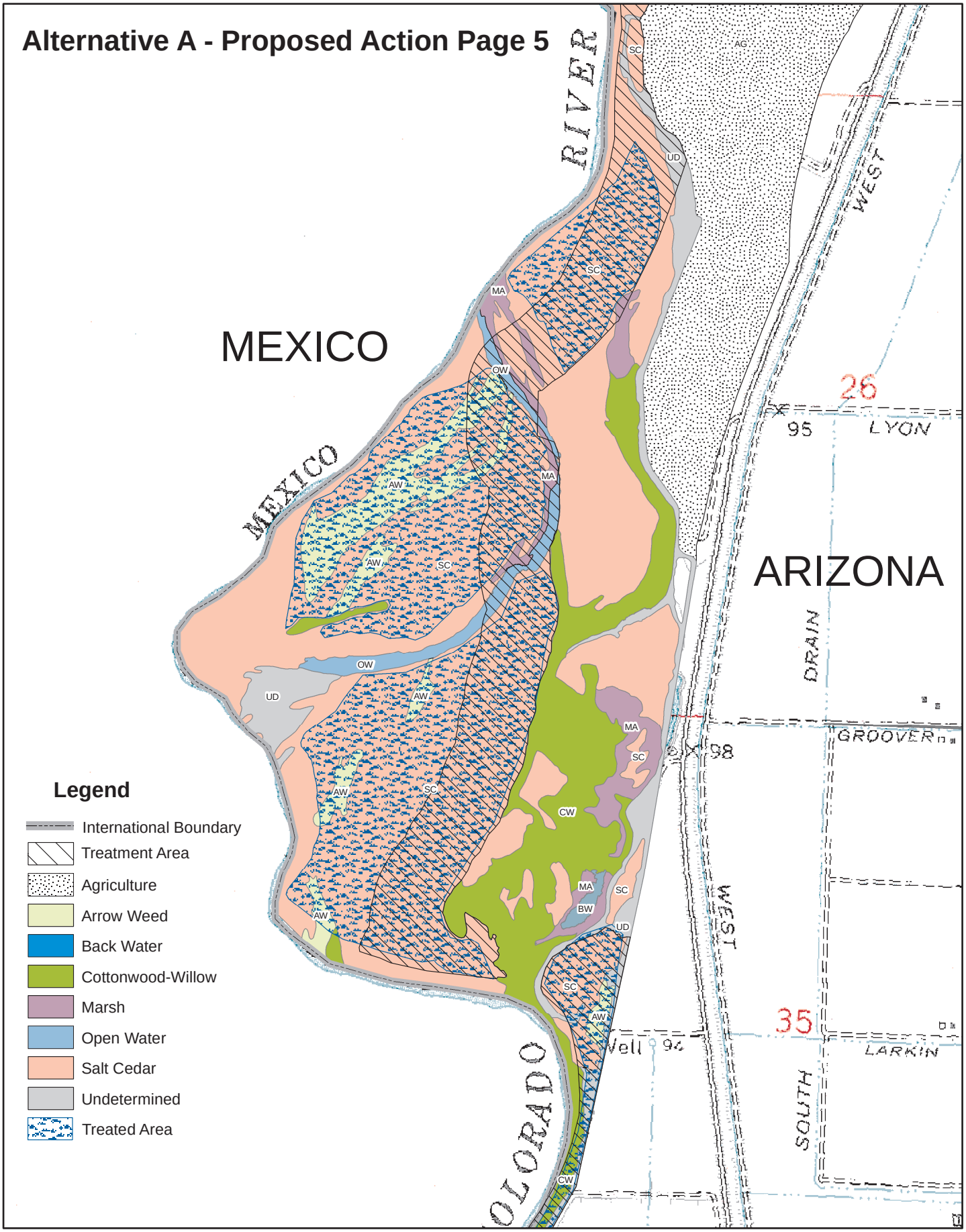
0.25 0.125 0 0.25 0.5 0.75 1

Miles


Alternative A - Proposed Action Page 5
MEXICO
ARIZONA
RIVER
MEXICO
COLORADO
WEST
DRAIN
SOUTH
LYON
GROOVER
LARKIN
26
95
98
35
94
Well
Legend
International Boundary
Treatment Area
Agriculture
Arrow Weed
Back Water
Cottonwood-Willow
Marsh
Open Water
Salt Cedar
Undetermined
Treated Area
AG
SC
UD
MA
OW
AW
BW
CW
N
0.25
0.125
0
0.25
0.5
0.75
1
Miles

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