

15 June 95

Shared Water Resources Overview Paper No. NPS-02

Study Areas: Colorado River/Sea of Cortez Subarea
Pacific Basin/Salton Sea
Mimbres/Animas

Bureau: National Park Service (NPS)

I) Colorado River/Sea of Cortez Subarea

The NPS administers one unit of the National Park system located within the Colorado River (below Parker Dam)/Sea of Cortez subarea, **Organ Pipe Cactus National Monument** (Arizona).

Organ Pipe Cactus National Monument

Organ Pipe Cactus National Monument is a 330,689 acre unit of the National Park system which was established to protect Sonoran Desert plants and animals found nowhere else in the United States, as well as to preserve archeological and historical resources. The National Monument is located in southern Arizona where it shares a 30 mile common boundary with the State of Sonora, Mexico. An particularly important feature of the National Monument is Quitobaquito Springs, a reliable, water source has been a center of activity since prehistoric times and which provides habitat for the endangered Desert Pupfish (*Cyprinodon macularius*). The National Monument has also been designated by the United Nations as an International Biosphere Reserve.

Water Resources

Typical of the arid Sonoran Desert, surface water is scarce. No perennial streams or rivers exist within the National Monument. Seventy-one natural water features including 11 springs and 60 tinajas (temporary pools in rock catchments) have been identified in the National Monument. The National Monument is drained by two major basins: the Rio Sonoyta to the south and San Cristobal Wash to the north. Approximately 43% of the National Monument drains to the Rio Sonoyta in Mexico by way of ephemeral channels. The perennial Rio Sonoyta flows parallel to, and within one to three miles of the international border for almost the entire width of the National Monument. The rest of the National Monument drains north to the Gila River by way of San Cristobal Wash.

Water Issues

1) Overpumping & Alteration of Groundwater Levels

The most significant water resource threat, by far, is the pumping of groundwater for agriculture and other uses immediately adjacent to the southern boundary of the National Monument in Mexico, where

the rate of water use greatly exceeds the rate of recharge.

Currently, approximately 290 wells pump over 55,000 acre-feet of water annually to support 32,000 acres of irrigated agriculture. While the Mexican government recognizes groundwater overdraft as a problem and has placed a moratorium on new wells, pumpage is estimated to still exceed the rate of recharge by approximately 2.5 times (Brown, 1988). In addition, with the passage of NAFTA, local development is expected to increase. The Mexican Government has recently set aside 5,000 hectares less than 30 miles from the National Monument for development as an industrial park.

The Organ Pipe Cactus National Monument Water Resources Management Plan (NPS, 1992) identifies a number of management concerns resulting from this over-pumping. These include:

Impacts to Quitobaquito Springs. This reliable spring and adjacent flowing stream is located approximately 100 meters north of the international boundary. This spring has been a center of activity since prehistoric times as it is one of the few reliable surface water sources in the region. The spring is also recognized for its importance in providing habitat for the endangered Desert Pupfish (*Cyprinodon macularius*) as well as other species associated with its riparian and aquatic environment. As the largest open body of water in the National Monument, Quitobaquito Springs is also a popular visitor attraction.

The nature of the aquifer that supplies the springs is not well understood. The productivity of the springs is apparently an anomaly in such an arid region. The aquifer is adjacent to, if not an integral part of, an aquifer that is being pumped extensively just across the border in Mexico. In order to achieve a level of understanding that will allow the National Monument to assess the threat posed by pumping, the National Monument has identified the need to undertake a study to determine the Geohydrology of Quitobaquito Springs (NPS, 1992). This study is currently underway in cooperation with the U.S. Geological Survey. Recommendations for additional research and/or long term monitoring needs will be developed within the scope of this study.

Land Subsidence. As the groundwater table in the Sonoyta Valley continues to fall as a result of pumping in Mexico, land subsidence will also occur. This is likely to result in earth cracks that will potentially disrupt natural drainage/aquifer characteristics, potentially alter habitat characteristics, and possibly damage facilities. Effects will be most pronounced in the deep alluvium of the Sonoyta Valley. The National Monument proposes to establish a baseline survey along the Mexican border to document land subsidence, a need that is currently unfunded (NPS, 1992).

Protection of Riparian Ecosystems. Riparian areas represent some of the most diverse and productive ecosystems in the National Monument. Some of the plants within this community depend on relatively shallow water tables. A significant and/or rapid

lowering of the water table would eliminate these riparian ecosystems. The National Monument proposes to determine the present status and establish long term trends through a program to monitor riparian ecosystems (NPS, 1992); however, as of 1994, the project has not been funded.

2) Lack of Basic Resource Information

In addition to the specific issue of over-pumping discussed above, the National Monument currently lacks adequate basic resource information in the following water-related areas:

Characteristics of Regional Aquifers. Aquifers that supply groundwater to the Rio Sonoyta Valley are not well understood. A relatively simple literature analysis is proposed to define characteristics of regional aquifers (NPS, 1992); however, as of 1994, the project has not been funded.

Inventory and Monitoring of Water Resources. The current water resources inventory for the National Monument includes little information on water quality and provides no indication of trends. A three phase study for long term monitoring is proposed to update water resources inventory and monitoring (NPS, 1992); however, as of 1994, the project has not been funded.

Pollution Threats from Kuakatch and Cuerda de Leña Washes. These washes enter the monument as major surface drainage from public and private lands north and east of the National Monument and from the Tohono O'odham Reservation. Land uses of concern include ranching, a small community, and most importantly, a huge copper mine at Ajo. In order to detect pollution that may be entering it's borders, the National Monument proposes to identify pollution threats from Kuakatch and Cuerda de Lena Washes (NPS, 1992) ; however, as of 1994, the project has not been funded.

Point of Contact: Superintendent Harold Smith
Organ Pipe Cactus National Monument
Route 1, Box 100
Ajo, AZ 85321
(602) 387-6849

Literature Cited

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Note: A bibliography of water resources studies and information available for ORPI is provided as a separate appendix.

II) Pacific Basin/Salton Sea Subarea

The NPS administers two units of the National Park system located or partially located within the Pacific Basin/Salton Sea subarea, **Cabrillo National Monument** and **Joshua Tree National Park**.

Cabrillo National Monument

Cabrillo National Monument is a 145 acre unit of the National Park System located on the Point Loma peninsula along the western side of San Diego Bay approximately 10 mi (16 km) north of the international boundary. The purpose of the National Monument is to commemorate the accomplishments of Juan Rodriguez Cabrillo as well as to preserve and educate the public about the coastal sage scrub and marine tidepool environments found within the National Monument.

Water Resources

The National Monument includes approximately one-half mile of rocky shoreline which includes several tidepools which are managed under a cooperative agreement with the U.S. Army Corps of Engineers.

Water Issues

A transboundary water resource issue that may affect Cabrillo National Monument is possible contamination of the tidepools and shallow coastal environments with sewage effluent discharged into the Pacific Ocean from the Tijuana River. The sewage effluent, originating from Tijuana, Mexico periodically spreads northward from the Tijuana River estuary contaminating beaches and marine resources in Imperial Beach and possibly reaching as far north as Cabrillo National Monument. When this occurs, the NPS will periodically close public access to popular tidepool areas as a public health protection preventive measure. A proposed measure to construct an international wastewater treatment facility to treat sewage generated by Tijuana should alleviate this problem.

Other water resource issues include possible water quality degradation caused from stormwater runoff from the City of San Diego, potential water quality contamination from San Diego Bay, Naval Research & Development Facilities, and the Point Loma Wastewater Treatment Plant and potential contamination from an offshore oil spill.

In 1995, the NPS and the U.S. Navy began a joint project to define baseline water quality, aquatic biology and sediment contaminants conditions in order to prepare for a natural resource damage assessment in the event of a future oil spill.

Point of Contact: Superintendent Terry DiMattio
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Joshua Tree National Park

Joshua Tree National Park is a 795,000 acre unit of the National Park system located approximately 100 miles (160 km) north of the international boundary. The Park preserves an ecologically unique biological transition zone between the Mojave Desert and Sonoran Desert ecosystems with elevations ranging from near sea level to more than 6,000 feet. Joshua Tree National Park has been designated an International Biosphere Reserve by the United Nations.

Water Resources

Only the southernmost portion of Joshua Tree National Park is located within the Pacific Basin/Salton Sea subarea., with drainage through the Coachella Valley to the Salton Sea. Naturally occurring surface water resources in this portion of the park are scarce, consisting of a few springs and oases and temporary pools within rock catchments (tinajas).

Two perennial springs, Cottonwood Oasis and Lost Palms Oasis support the native California fan palm and are heavily used by migratory bird species, including species found in the Salton Sea.

Water Issues

Water resources issues in this portion of Joshua Tree National Park are local in nature and consist primarily of a lack of baseline information and periodic localized flash flooding. The NPS has recently initiated a baseline water resources inventory to more thoroughly document these resources.

Point of Contact: Superintendent Ernest Quintana
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III) Mimbres/Animas Subarea

The National Park Service does not administer any areas located in the Mimbres/Animas Subarea.

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Attachment 2.

MEMORANDUM OF UNDERSTANDING
between
NATIONAL PARK SERVICE OF THE DEPARTMENT OF THE INTERIOR
OF THE UNITED STATES OF AMERICA
and
SECRETARIAT OF URBAN DEVELOPMENT AND ECOLOGY,
UNITED MEXICAN STATES
on
Cooperation in Management and Protection of National Parks
and Other Protected Natural and Cultural Heritage Sites

Memorandum of Understanding between the National Park Service of the Department of the Interior of the United States of America and the Directorate General for Ecological Conservation of the Natural Resources of the Secretariat of Urban Development and Ecology of the United Mexican States for Collaboration in the Conservation and Management of Protected Natural Areas and Cultural Heritage Resources; the National Park Service of the Department of the Interior of the United States of America, hereinafter referred to as "USNPS", and the Directorate General for Ecological Conservation of Natural Resources of the Secretariat of Urban Development and Ecology of the United Mexican States, hereinafter referred to as "D.G.C.E.R.N.":

Recognizing the advanced cooperation that exists between USNPS and D.G.C.E.R.N., hereinafter referred to as the "parties", in the rational use and management of natural resources and the establishment and conservation of protected natural areas that are their natural and cultural heritage;

Noting the mutual interest in the establishment and management of national parks and protected areas, that may be close or contiguous with the border, with the purpose of conserving ecosystems and promoting natural and cultural tourism;

Recognizing the advantages of facilitating, coordinating and amplifying efforts in conservation, management, development and research of natural and cultural resources in protected areas of mutual interest to both countries;

Recognizing the mutual interest in strengthening cooperation between the parties in the exchange of information and informal education activities for the management and operation of parks;

Noting the mutual objectives and interests of the parties declared in the conservation on nature protection and wildlife preservation in the Western Hemisphere of October 12, 1940; the Agreement of Scientific and Technical Cooperation between the United States of America and the United States of Mexico of June 15, 1972; the Convention Concerning the Protection of World Cultural and Natural Heritage of November 16, 1972; the convention for the Protection and Development of the Marine Environment of the Wider Caribbean

Region of March 24, 1983; and, the Agreement on Cooperation for the Protection and Improvement of the Environment in the Border Area of August 14, 1983;

Recognizing that the conservation policy in force in Mexico contemplates working in coordination and consultation with rural communities to conserve and rationally use and sustain natural areas and their resources, in a fashion that guarantees the preservation of biological diversity and the equilibrium of ecosystems, while at the same time allowing for integrated rural development;

Recognizing that the park policy in force in the U.S. is to conserve the scenery and natural resources and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations while, at the same time expand the role and involvement of citizens and groups in achieving the mission of USNPS and ensuring relationships with those whose lives and traditional practices are affected are considered in planning and management;

Recognizing that the biological diversity found in the two countries and the demographic pressure on natural areas and resources the implementation of conservation strategies and techniques unique to each country, seek, nonetheless, the joint development of appropriate strategies that support the maintenance and restoration of biodiversity in both countries, including those regarding the reintroduction of shared indigenous species extirpated in the respective national parks of the United States and Mexico;

The parties hereby agree to cooperate as set forth in this memorandum:

ARTICLE 1

This memorandum has as its objective the creation of a framework for the cooperation between the parties concerning: the conservation of protected natural areas and their biodiversity, the preservation of cultural heritage and natural resources, and when possible recognition of sustainable development alternatives for rural mexican communities located in those areas, the exploration of strategies for related cooperation with rural communities, citizens groups and scientific and other organizations acceptable to both countries within the legal framework of each country.

ARTICLE 2

1. The parties will establish a committee to formulate, orient and update cooperative activities to accomplish the objectives outlined in this memorandum. The committee will be chaired by the Director of the National Park Service for the United States of America and the Director General for Ecological Conservation of Natural

Resources of the United Mexican States.

2. The committee will meet normally on an annual basis and alternating between the two countries, to review proposed and ongoing projects. Documentation for the projects will be reviewed, as well as a list of participants, will be exchanged two months prior to each meeting. The chairmen will decide by mutual consent whether to approve proposed projects and to continue ongoing projects.

3. Administrative procedures for the organization and work of the committee are set forth in the annex to this memorandum and may be amended by the mutual consent of the chairmen.

4. U.S. and Mexican coordinators and co-leaders, established within the annex, will meet as often as necessary.

ARTICLE 3

1. The forms of cooperative activities under this memorandum may consist of exchanges in information in natural and cultural heritage management and use; equal exchange of information regarding planning, management, and operations of parks and protected heritage sites and planning and conduct of courses, conferences, and symposia pertaining to the same; research in protected areas; personnel exchanges in fields of mutual interest within the scope of ongoing programs of both countries; and other forms of cooperative activities as mutually agreed upon.

2. The specific areas of mutually beneficial interest for cooperative activities may include, but are not limited to:

A. Establishment of natural and cultural heritage areas consistent with the policies and regulations of each country and their conservation, administration and development, and monitoring of protected natural and cultural areas, especially those contiguous to the international boundary.

B. Collaboration between specialized personnel from the parties in the management, development and administration of protected natural areas; in the research and management of natural and cultural heritage; and, in the planning and design of visitor programs and facilities.

C. Specialized projects related to the management of protected natural areas, including, but not limited to, arid and semi-arid environments and marine coastal zones.

D. Exchange of information regarding the goals of this memorandum and in other areas mutually identified and accepted by the parties.

E. Development of educational and public information focusing on the environment and in understanding of protected natural areas and cultural heritage.

F. Completion of studies that will support, among others, the definition and formulation of strategies for the rational and

sustainable use of natural resources.

G. Technical cooperation to protect, conserve, and maintain the flora and fauna within shared ecosystems protected by one or both countries.

3. For involvement requested by D.G.C.E.R.N. that extends into subjects outside the scope of the USNPS, the USNPS may, with the consent of D.G.C.E.R.N., and to the extent compatible with existing laws, regulations and policies of the United States of America, endeavor to enlist the participation of other organizations or agencies of the United States of America in the development and implementation of activities within the scope of this memorandum. For involvement requested by the USNPS that extends into subjects outside the scope of the D.G.C.E.R.N., the D.G.C.E.R.N. may, with the consent of the USNPS, and to the extent compatible with existing laws, regulations and policies of the United Mexican States, endeavor to enlist the participation of other organizations agencies of the United Mexican States, in the development and implementation of activities within the scope of this memorandum.

ARTICLE 4

Cooperation under this memorandum will be subject to the availability of funds and personnel of each party, and to the laws and regulations of each country. The nature and extent of funding of each project will be agreed upon by the parties before its commencement.

ARTICLE 5

Information transmitted by one party to the other party under this memorandum will be accurate to the best knowledge and belief of the transmitting party. The transmitting party does not warrant the suitability of the information transmitted for any particular use of or application by the receiving party.

ARTICLE 6

Nothing in this memorandum will be construed to prejudice other existing or future agreements concluded between the governments of the United States of America and United Mexican States, nor will it affect the rights and obligations of the two governments under international agreements to which they are a party. In particular, nothing will affect the objectives of the Water Treaty of 1944 and other boundary and water treaties and agreements in force between the two governments, nor shall it be understood to prejudice or otherwise affect the functions entrusted to the International Boundary and Water Commission.

ARTICLE 7

This memorandum will enter into force upon signature, and will remain in force for five years. It may be extended or amended by

written agreement of the parties.

This memorandum may be terminated at any time by either party, upon written notification through diplomatic channels ninety days in advance of such termination. The termination of the memorandum will not affect the validity or duration of projects under this memorandum which are initiated prior to such termination.

Done at Mexico City, on this 30th. day of November, 1988 in duplicate in english and spanish, both texts being equally authentic.

SIGNED

For the National Park Service of the U.S. Department of the Interior; Mr. William Penn Mott, Jr., Director of the U.S. National Park Service

For the General Directorate for Ecological Conservation of Natural Resources of the Secretariat of Urban Development and Ecology; Dra. Graciela de la Garza, Director General

WITNESSED

Mr. Charles J. Pillroid, Jr., Ambassador of the United States of America to Mexico City

Fis. Sergio Reyes Lujan, SubSecretary of Urban Development and Ecology

ANNEX

Annex to the Memorandum of Understanding between the National Park Service and Directorate General for Ecological Conservation of Natural Resources

The National Park Service of the Department of the Interior of the United States of America and the Directorate General for the Ecological conservation of Natural Resources of the Secretariat of Urban Development and Ecology of the United Mexican States hereby agree to the administrative procedures for the organization and work of the committee as set forth in this annex.

ARTICLE 1

The program of cooperative activities between the parties will consist of projects and sub-projects. Documentation on all proposed and ongoing projects and sub-projects will be exchanged two months prior to each meeting and will be presented at the meetings of the committee for review and approval by mutual consent of the chairmen. Documentation, in support of proposed projects, may be submitted by either party and will be comprised of the following information:

- Description of the project and sub-projects
- Objectives
- Methodology to be used in joint development
- Calendar of events and date of conclusion
- Equipment and personnel required
- Estimated costs, itemized budget and methods of financing

All projects will consider and include, when possible, information workshops detailing the actions developed during the project for the personnel of both countries, as part of their structure.

ARTICLE 2

Each party will designate a coordinator to monitor the progress of ongoing projects and sub-projects between the meetings of the committee and to prepare the meetings of the committee.

ARTICLE 3

Each project and sub-project will be under the supervision of a U.S. and Mexican co-leader, who will be selected respectively by each of the parties. The co-leaders will be responsible for jointly developing and submitting, to their respective coordinators, documentation in anticipation of upcoming committee meetings. Such documentation will comprise a final report or report on the status, finances and objectives achieved within each ongoing project and sub-project.

ARTICLE 4

All joint projects and sub-projects must be approved by the chairman of the committee before they can be financed or changed by the coordinators of co-leaders.

ARTICLE 5

Those projects and sub-projects that, in the view of the chairmen, require special or urgent consideration, can be reviewed and approved by them at any time by mutual consent.

ARTICLE 6

Minutes of the meeting will be drafted in duplicate to be signed by the chairmen. The minutes will contain the proposed program of activities, including the approved cooperative activities, to be carried out between the meetings of the committee, as well as any other matters that have been discussed.

ARTICLE 7

The minutes of the committee will be transmitted to the mixed commission on scientific and technical cooperation between the United States of America and Mexico.