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Information Sheet on Ramsar Wetlands

1. Date this sheet was completed/updated: 20 August 2001
2. Country: Mexico
3. Name of wetland: Cuatrociénagas Wildlife Protection Area
4. Geographical coordinates:

26° 42' 11" – 27° 00' 05" North latitude
101° 52' 07" – 102° 25' 24" West longitude

5. Altitude: 740 metres above sea level

6. Area: 84,347 hectares

7. Overview: The Cuatrociénagas Wildlife Protection Area is located mainly in the lower and flat part of the valley of the same name at an altitude of approximately 740 metres above sea level in the state of Coahuila. This valley includes canyons and wide fans, alluvial plains saturated with salts, with several low hills and a large area of chalk dunes, unique in Mexico. This hydrological complex is interconnected underground and on the surface by rivers, streams, marshes and lakes of various sizes and depths, with the largest 600 metres in diameter. This site is considered an important centre for endemism and a place that is internationally recognized for pure and applied research, educational activities at all levels and outdoor recreation.

8. Wetland type:

Continental: M, O, R, Y and Zk(b)
Artificial: 1, 2 and 9

Types of wetlands by decreasing order of importance: Q, R, Ss, M, N and Zg

9. Ramsar criteria: 2 and 7

10. Map of site included? Please tick yes -or- no

11. Name and address of the compiler of this form:

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12. Justification of the criteria selected under point 9, on previous page:

Criteria 2 and 7: This area has groups of endemic fauna associated to each other, including molluscs, fish, crustaceans, *estromatolitos* and other invertebrates. There is also a considerable number of species in the following conservation status.

Protection Status of Species in the Cuatrociénegas Valley

Group	Endangered	Vulnerable	Special protection	Number at risk	Number of species	Endemic species
Mammals	2	3	1	6	60	
Birds		7	6	13	134	
Reptiles		16	16	32	60	9
Amphibians			2	2	8	
Fish	5	4	1	10	17	10
Molluscs	7		0	7	29	13
Crustaceans					27	6
Scorpions					19	5
Insects			1	1	-	2
Plants	2	9	8	18	712	18
Total	16	39	35	89	1066	63

Another important aspect to be taken into account is that this site is of critical importance for conservation because of loss of habitat. This wetland is important because of its high level of endemism for the Neartic region,. Several of the species are endemic to the wetland, because 100 per cent of the populations are within the wetland. There are a large number of interactions among endemic species such as fish-molluscs, fish-*estromatolitos*, molluscs-*estromatolitos* and molluscs-parasites-fish. Among the groups, the fish are important because 10 of the 17 species are endemic to this wetland. In addition, the wetland plays the role of maintaining the functioning of the ecosystem and the underground and surface water reserves, which are used for agriculture, recreation, grazing and environmental education.

13. General location:

The Cuatrociénegas Valley is located in the area formed by the Menchaca, San Vicente, La Purísima, San Marcos, La Fragua and La Madera mountains. The main access is by Federal Highway 30, which joins Ciudad Monclova to San Pedro de las Colonias. In the northern part, next to the border of the wildlife protection area, is the city of Cuatrociénegas de Carranza, the main town in the municipio with about 10,000 inhabitants. Likewise, within the wildlife protection area are located four *ejidal* communities and in the surrounding area there are eight *ejidos* with influence on the area, with a total of 1,329 persons living in the rural communities.

14. Physical features:

The region is formed by mountains with folded strata, predominantly Mesozoic from the Cretaceous and Jurassic over a foundation of Palaeozoic marine sediments from the Permian and some post-Permian intrusive rocks. In the alluvial basin, there are dominant terrestrial deposits from the Tertiary and Quaternary. The orogenic formation, from the centre of Coahuila and therefore from the area, began with the rising of the southern portion of the structural Marathon-Ouachil axis (Maldonado-Koerdell, 1961). This caused the sea to enter the Mexican geosynclinal complex, which existed throughout central and northern Mexico from the Triassic to the late Cretaceous, approximately 160 million years ago.

Physiographically, it forms part of the province of the Sierra Madre Oriental and within this, the subprovince called sierras and plains of Coahuila. In this subprovince, there are limestone hills of Mesozoic and marine sedimentary origin, which were subjected to surface forces of tension and compression that gave origin to the rising of steep limestone hills that alternate with intermountain valleys oriented northwest to southeast, most of them steep and rather small.

The Cuatrociénagas Valley is part of the Bravo-Conchos hydrological region, within the Presa Falcón-Río Salado basin, corresponding to the Río Salado-Nadadores sub basin. The valley is also located within the geohydrological area called Cuatrociénagas-San Miguel. In this area, there are many bodies of water known locally as wells, which are springs, whose diameters range from less than one metre to more than 100. Their depths range from 50 centimetres to more than 18 metres. Some of the wells are linked naturally or artificially among each other by a complicated drainage system. Most of the springs are located on the sides of the Sierra de San Marcos y Pinos, forming about 200 wells in the valley. There are also several streams, such as Río Mezquites, most of which are permanent. However, most of the water is underground. There are two larger lakes in the valley called Playitas and Churince. The first is a modified system supplied by water from an artificial canal and the second is a relatively intact system in the water.

Originally, the valley formed a closed basin, and possibly marshes and shallow flooded areas formed in the lowest part. In 1887, water was first exported from the Cuatrociénagas Valley for agriculture. Channelling of several of the largest springs has decreased the marsh areas and changed the pattern of floods in the valley. Currently, there are six canals for agriculture functioning in the protected area. All of them channel water from the springs, and the distribution and irrigation systems function by gravity.

The dominant soils in the area are brown litosols of medium texture associated with other deeper and darker soils (rendzinas) that lie under calcareous material and are located in the highest parts. There are also litosols associated with calcareous regosols. In the lowest parts of several mountain ranges such as the Sierra de la Madera, medium texture xerosols dominate followed by calcareous regosols. In areas where water accumulates, there are luvic and gypsiferous xerosols with problems of salinity and soda concentration. There are also very alkaline lacustrine or alluvial soils, ortic solonchak. In the hills that surround the Cuatrociénagas Wildlife Protection Area there are dominant rocky lithosol soils, which are shallow with depths of 5 to 10 centimetres. On the valley floor, there are alluvial soils that are the result of sediment load and accumulation of materials towards the lowest

parts, such as solonchak, yerosol, regosol and yermosol. Several of them are saline and chalky, resulting from evaporation caused by high temperatures. The chemical characteristics of the saline soils are determined primarily by the type and amount of salts present. In the valley, the soils are separated into three types: saline, saline-soda and non-saline-soda soils.

15. Hydrological values:

According to the studies of water use and data on the water table made in this area during the ecological study of this area, the aquifers in the valley are free and located in fill materials. There are several freshwater springs whose quality is tolerable. The units of consolidated material with average possibilities for development of underground water are distributed in scattered springs located mainly in northeastern Cuatrociénagas Valley and on the slopes of the Sierra Madre and around the Sierra de San Marcos. In these units, there is a series of springs that reach the surface at the base of the mountains. Water quality is acceptable, and the water is used for agriculture. The characteristics of the underground water are calcareous, with magnesium and soda-sulphate.

According to Minckley (1969), there are seven large drainage systems in the Cuatrociénagas basin that apparently are relicts of a more extensive system that developed in the recent past.

1. The system that began in Laguna Grande, La Becerra and flowed towards the lakes known as the Garabatal;
2. Río Mezquites, which is the largest system in the basin, originating in thermal and cold springs;
3. Río Puente Chiquita is fed by cold water. This river is probably directly connected to the Río-Grande system (Río Salado de Nadadores) through a low area in the northern part of the basin;
4. The system that originates in Laguna Tía Cándido and which is a spring known as Escobedo;
5. The Santa Tecla system flows north-northwest to enter in the southern part of a large reservoir in the east;
6. Río Salado de Nadadores (Río Grande) flows permanently and apparently is isolated from the others.

This area has a wide variety of bodies of water that vary in permanence, temperature, concentration of dissolved solids, dominant ions, size and condition of internal and external drainage.

16. Ecological features:

According to the ecological affinities of the flora in the region, the following ecological areas are defined for Cuatrociénagas:

Zacatón grasslands at the bottom of the basin;
Aquatic and semi-aquatic habitats;
Chalk dunes;
Transitional areas between grasslands and lowlands;
Desert matorral;
Chaparral.

According to these ecological areas and the land use classification and vegetation of INEGI, Cuatrociénagas has eight types of characteristic vegetation: halophytic matorral, halophytic grassland, vegetation of aquatic and semi aquatic habitats, gypsophile vegetation, macrophytic desert matorral, rosetophilous desert matorral, chaparral and submontane matorral. According to Pinkava (1984), the phanerogamous flora of Cuatrociénagas is made up of 712 taxa, in 700 species, 382 genera and 100 families, most of which is specific to the xerophytic matorrales. One of the outstanding characteristics of the flora of this region is the presence of numerous endemic taxa, which, although they represent only 2.5 per cent of the total, are threatened by any disturbance because of their small populations and specific and restricted distribution. The fauna of the Cuatrociénagas region is perhaps the most studied in all the arid areas of Mexico. Interest in this flora is because of the high number of endemic taxa in the region. Among the most studied groups are the ichtiofauna, carcinofauna, malacofauna, ornithofauna and mastofauna.

17. Noteworthy flora: [see figure in Spanish version]

18. Outstanding fauna: [see figures in Spanish version]

19. Social and cultural values:

From the point of view of archaeology and history, the Cuatrociénagas Valley is considered an oasis, which is a place in the desert with permanent water. Because of this, various nomadic tribes settled in this site for long periods for several thousand years. There are many archaeological traces of these cultures, such as cave paintings, arrowheads and stone axes, *metates*, baskets, *petates* and *guaraches*, among others, which can be found throughout the valley (Valdés, 1996). In several caves in the mountains near the valley, it is possible to find human remains and artefacts. Unfortunately, many of them have been looted. On the walls of the caves, there are cave paintings and petroglyphs. The monuments listed in the Catálogo Nacional de Monumentos Históricos Inmuebles (SEP, 1986) in the valley are the Capilla de San Pablo in the El Venado *ejido* and the Capilla del Sagrado Corazón in the La Vega *ejido*. The traditional festival of Cuatrociénagas is the Feria de la Uva, which is held in the summer. As in other parts of the country, religious feasts and patriotic days are celebrated.

20. Land tenure/ownership of:

Within the protected nature area, there are parts of eleven *ejidos*, which represent 41 per cent of the area of the 84,347 hectares of declared protected area. The rest of the area is small farms.

21. Current land use:

The area used for farming and forestry activities in the municipio of Cuatrociénegas is similar to that of 1930, but where there has been a noticeable change is in the type of land tenure, because by granting land to the *ejidos*, the haciendas have disappeared. It is also important to point out that the amount of cultivated land was 4,397 hectares and now there are 14,447 hectares in this category. The area used for irrigated farming in 1930 was 1,690 hectares and in 1960 3,363 hectares. For 1994, there were 9,321 hectares recorded as irrigated farmland. From 1960 until now, irrigated farmland has tripled, partly as a result of the construction of irrigation works such as canals in the valley and its area of influence and the drilling of irrigation wells.

With regard to livestock raising, changes have occurred at the municipal level concerning the number of head of cattle. In the 1994 census, there were a total of 18,770 head of cattle, which has increased in relation to former years. Likewise, the number of goats has increased from 10,000 in 1950 to 17,000 now. Horses, which are the most important domestic animals in the protected area, have remained at between 4,000 and 6,500 head since 1950, although in 1950 donkeys were more abundant. This was possibly due to the exploitation of *candelilla* and *guayule*. In the valley, mesquite is exploited as firewood and around the protected area *candelilla* grass is exploited from which wax (*cerote de candelilla*) is extracted.

22. Factors (past, present or potential) adversely affecting the site's ecological character, including changes in land use and development projects:

The ecosystems and biota of Cuatrociénegas has been subjected to anthropogenic pressure since the nineteenth century with the arrival of the first population that settled permanently in the region and has been increasing over the past one hundred years substantially because of the increase in local population and in the area of influence with the resulting demand for natural resources, which is reflected in changes in land use, creation of access roads, extraction of water from the springs for distribution in the farming areas within and outside the valley, exploitation of chalk dunes for more than 30 years until 1996, when mining in this area was closed and by extensive livestock raising.

23. Conservation measures taken:

The Cuatrociénegas Valley located in central Coahuila was declared a protected nature area in the category of wildlife protection area by act published in the Diario Oficial of 7 November 1994. In 1997, SEMARNAP provided resources for hiring the basic staff of a director, coordinator, two project chiefs and an administrative assistant. The staff is now financed by the Comisión Nacional de Areas Naturales Protegidas. Since then, support has been provided for equipment and operation of the staff through participation of trained personnel in the area, significantly decreasing the impacts and threats to the natural resources. In addition, an advisory council has been formed for the protected nature area, integrated by representatives of the federal, state and municipal governments, the universities, non-governmental organizations and representatives of the *ejidos* and private

property. The first conservation and development options of this ANP are based on the initial management programme, published on 24 March 2000, which is a basic working instrument for conservation and development of this important site by the government and international and national institutions.

24. Conservation measures proposed but not yet implemented:

Conservation and development of the area is strengthened by support from the Global Environment Fund II, which will be applied under the social strategy of the development project for the vulnerable social groups, monitoring of this project and conservation of the protected area. This support will be provided beginning next year. The strategies being used in the protected nature area are strengthening of the advisory council for planning conservation and development programmes, establishment of a system for direct consultation with the leaders of the local communities and authorities, training for conservation, integration of women in productive projects, integration of ecology clubs into conservation and development projects, integration of publicity campaigns for diffusion of the values of the area and its conservation, integration of a programme of diffusion, environmental education and information at the regional level for conservation and sustainable development of the reserve through Pronatura Noreste A.C. with whom the programme for this year was prepared beginning in September.

25. Current scientific research and facilities:

The most important research carried out in the reserve are the projects "Evolutionary ecology of Cuatrociénagas" by Arizona State University and the Universidad Nacional Autónoma de México, "Cuatrociénagas 2000" by the La Venta Exploring Team, "The fish of Northeastern Mexico: an integral approach for knowledge and conservation" by the University of Texas, Northern Arizona University and the Instituto Tecnológico de Ciudad Victoria, "Distributional status of native species and emergency monitoring programme, elimination and control of pest species of fish, snails and exotic plants in the Cuatrociénagas Valley, Coahuila, Mexico" by the Universidad Autónoma de Nuevo León and "Pozo de la Becerra, Cuatrociénagas, Coahuila: interdisciplinary study for planning protection and management" by the Fondo Nacional de CONACULTA and "Monitoring of indicator species" by the administration of the protected nature area. In the area, there is a visitors' information centre, belonging to a local non-governmental organization Desarrollo Sustentable para el Valle de Cuatrociénagas, A.C. (DESUVALLE, A.C.). There are also guardhouses located at strategic points for better and greater coverage.

26. Current conservation education:

In the area, there is a visitors' information centre where not only visitors are received but also environmental education activities are carried out with the local and regional education centres. Commemorative activities are carried out here on Global Environment Day and summer courses on environmental education are organized. The Office of the Protected Nature Area, in coordination with the State Secretariat for Public Education, the Municipal Office for Ecology, the Centro de

Bachillerato Tecnológico Agropecuario No. 22 and the Desuvalle A.C. carry out various environmental education activities in the schools in the region.

27. Current recreation and tourism:

Tourist activities in the area are carried out mainly at the following sites.

The La Poza Azul Visitors' Information Centre is located on the edge of the Torreón highway, where relevant information is provided on nature, historical and cultural aspects of the valley as well as conservation efforts and on the fauna and flora of the region. The centre has specialized guides that show photographic exhibits, an interpretation trail around two ponds, one of which is Poza Azul, a beautiful spring because of its colour and the temperature of its water.

Pozo La Becerra is one of the most visited sites. It is a representative recreational site of the ponds in the valley with crystal water at a pleasant temperature where several species of fish can be observed in their natural environment. There is also a very beautiful scenery of mountains and brackish pastures. There are *palapas*, barbecues, camping areas, beach volleyball areas and miscellaneous services.

Balneario Los Mezquites is on the edge of the Río Mezquites in this natural beach area and is fed by several springs of crystal water at different temperatures. There are many *palapas* and barbeques for rustic recreation.

Dunas de Yeso form a unique landscape in Mexico of fine white sand dunes. one of the most amazing in North America for walks to observe strikingly beautiful and species adapted to the extreme arid conditions of this habitat.

Sierra de San Marcos y Pinos is an area of many steep canyons in the landscape of this mountain chain, which reaches 2800 metres above sea level, the site of indigenous communities where there are many cultural traces including paintings, engravings and pre-Hispanic artefacts. This is a marvellous site for observing the valley from above and the cactus species in the region.

Ejido Antiguos Mineros del Norte is an *ejido* on the eastern slope of the Sierra de San Marcos y Pinos, where guided hikes are organized for viewing the ponds and fauna and flora characteristic of this part of the valley. The *platy de Cuatrociénagas*, a soft-shelled black turtle and the *tortuga de bisagra* are found here. One of the trails leads up to the forested area at the top of the mountain chain, the seasonal site of the monarch butterfly on its migration from the forests of Canada to the Michoacán reserve. The *ejido* provides accommodations and ecotourism services.

Ejido Nuevo Atalaya is an accessible site for observation of the *tortuga de bisagra*, *tortuga de oreja roja*, song birds, archaeological remains and natural landscapes. The *ejido* offers guided hikes in the extreme south-western part of the valley and the Sierra de Fragua. Horses and donkeys are available for rent. Extraction of *candelilla* wax can be observed, which is a useful regional product for preparation of cosmetics, paint, shoe polish and the pharmaceutical industry.

28. Jurisdiction:

The wetland is located in the wildlife protection area in the municipio of Cuatrociénegas de Carranza, Coahuila, Mexico. The administration of this important site is the responsibility of the office for protected areas of the Comisión Nacional de Areas Naturales Protegidas, an independent organization of the Secretaría de Medio Ambiente y Recursos Naturales.

29. Management authority:

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30. References: