



The Council of Paleontology of INAH: Background and perspectives

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Abstract

The paleontological heritage refers to the movable (fossils) and immovable (paleontological deposits) assets of a nation. In Mexico, as in other countries, this heritage has problems such as commercial exploitation, urban growth, damage, illicit traffic, among others. The federal government agency responsible for protecting, preservation, restoration, and research of the paleontological heritage in Mexico is the "Instituto Nacional de Antropología e Historia", supporting the "Consejo de Paleontología", created in 1994. The Council suspended its activities in 2000. However, due to the current problems facing the paleontological heritage, the Council of Paleontology restarted activities in 2017 as a consultative-chartered organ that advises the INAH General Directorate on research, preservation, protection, and science outreach of the paleontological heritage located in the Mexican territory. This work aims to show the reason and purpose of creating the Council of Paleontology of INAH, the stages in which it has been working, the first from 1994 to 2000, and its reactivation in 2017. In addition, the different perspectives that each Council has had and the proposed solutions to the particular problems that each of them has faced.

Keywords: Council of Paleontology, fossil, INAH, legislation, Mexico, paleontological heritage.

Resumen

El patrimonio paleontológico se refiere al conjunto de bienes muebles (fósiles) e inmuebles (yacimientos fosilíferos) de una nación. En nuestro país, como en otros, este patrimonio es afectado por distintas problemáticas, principalmente aquellas relacionadas a actividades económicas y de urbanización, el saqueo, el tráfico ilícito, entre otras. El "Instituto Nacional de Antropología e Historia" es el órgano federal facultado en México para la protección, conservación, restauración e investigación del patrimonio paleontológico. A partir de 1994 se creó el "Consejo de Paleontología", pero suspende actividades en el año 2000. Sin embargo, debido a las problemáticas actuales a las que se enfrenta el patrimonio paleontológico, en 2017 se reactiva el Consejo de Paleontología, órgano colegiado de carácter consultivo que asesora a la Dirección General del INAH en materia de investigación, conservación, protección y difusión del patrimonio localizado en territorio mexicano. Este trabajo tiene como objetivo mostrar la razón y finalidad de la creación del Consejo de Paleontología del INAH, las etapas en las que ha estado trabajando, la primera de 1994 a 2000, así como su reactivación en 2017. Además, las diferentes perspectivas que cada Consejo ha tenido y las soluciones propuestas a los problemas particulares que cada uno de ellos ha enfrentado.

Palabras clave: Consejo de Paleontología, fósil, INAH, legislación, México, Patrimonio paleontológico.

1. Introduction

Fossils are all tangible evidence of life in the geological past. They reveal the geological and biological history of the Earth through time. Paleontology is the study of life in the geological past through fossils and their context (Prado, 2009; Abarzúa and Chávez, 2020).

Fossils and paleontological deposits result from biological and geological processes, being elements that form the geological environment and correspond to the natural heritage (Díaz *et al.*, 2016). However, fossils and paleontological deposits also constitute heritage assets because they provide a value of social interest that can be scientific, cultural, or educational (Morales *et al.*, 2002; Prado, 2009; Morales, 2019). UNESCO's Convention on the Means of Prohibiting and Preventing the Illicit Import, Export and Transfer of Ownership of Cultural Property of 1970 recognized the objects of paleontological interest as cultural assets.

From this concept, fossils and paleontological deposits are objects of study and elements that form the national heritage that needs preservation and protection. However, although international work has been done for some years in protecting paleontological heritage, the existing legal framework has complicated to implement (Table 1) (see Guerrero-Arenas *et al.*, on this issue).

Mexico is no exception to this situation, considering the "Instituto Nacional de Antropología e Historia" (INAH for your Spanish acronym) —as the institution designated by law to protect and conservation paleontological heritage in the Mexican territory— begins in 1994 to generate the mechanisms to fulfill this mission. One of these mechanisms

was the creation of the Council of Paleontology. This work aims to show the reason and purpose of creating the Council of Paleontology of INAH, the stages in which it has been working, the first from 1994 to 2000, and its reactivation in 2017. In addition, the different perspectives that each Council has had and the proposed solutions to the particular problems that each of them has faced.

2. INAH and the protection and conservation of the Mexican paleontological heritage

Mexico has a territorial extension of 5,120,679 km², including the continental and marine surface. Its geographical and geological formation has been complicated, which has resulted in diverse natural landscapes, including a great richness and abundance of flora and fauna diversity. Concerning its fossil record, there is also a wide biological and temporal diversity, which spanned from the Precambrian to the Pleistocene (ca. 560 million years – 10,000 years) (Arroyo-Cabrales *et al.*, 2008; Aguilar, 2017).

In the Mexican legal framework, fossils are part of the assets of their national heritage by the law named "Ley General de Bienes Nacionales" [General Law on National Assets] (Article 6 section XVIII):

“The movables assets of the Federation which by their nature are not normally replaceable, such as paleontological pieces, are subject to the regime of public domain”.

In 1939, the INAH was created and designated as the federal government agency responsible for researching, preserving, and disseminating archaeological,

Table 1. The concept of paleontological heritage in different nations.

Definition	Country	Reference
<i>The paleontological heritage encompasses, on the one hand, the set of sites known and studied by the paleontological community (immovable heritage) and, on the other hand, the set of collections, specimens, museums and exhibitions that form the material used in research, and with teaching or social dissemination purposes, in paleontology (movable heritage).</i>	Argentina	Prado, 2009
<i>“Paleontological heritage is the set of properties that represents the evidence of the geological and biological past of the country.” It consists of those recovered from their original context and that are protected in collections (movable paleontological heritage) and by the deposits whose characteristics require in situ preservative and preventive actions (immovable paleontological heritage).</i>	Mexico	Aguilar Arellano and Polaco Ramos, 2006; Aguilar, 2017
<i>All fossils with paleontological interest generated in the national territory that are in their natural location or that have been removed from their original context or extracted from the national territory. This also includes the areas covered by water and the subsoil under these.</i>	Peru	Ministerio de Cultura Perú, 2014
<i>Paleontological heritage is an integral part of the geological heritage. The immovable paleontological heritage refers to localities where the rock is exposed on the surface and is of a special interest from the point of view of its fossil registry. The movable paleontological heritage refers to fossils that are usually extracted for ex situ preservation in fossil museums or scientific collections, and therefore require specific regulation.</i>	Colombia	Servicio Geológico Colombiano, 2017
<i>The paleontological heritage (movable and immovable) is the set of direct remains of organisms or indirect remains (result of their biological activity) that has been preserved in the geological registry and assigned a scientific, didactic or cultural value.</i>	Spain	Vegas <i>et al.</i> , 2018

anthropological, and historical heritage in Mexico (Olivé, 2003). In 1985 the Organic Law of the INAH had a series of reforms. One of these reforms included Article 2, where the INAH had competence from paleontological heritage.

Another important reform in legal protection of fossils in Mexico was in the law called "Ley Federal de Monumentos y Zonas Arqueológicas, Artísticas e Históricas" by adding the Article 28 BIS:

“For the effects of this Law and its Regulations, the provisions regarding archeological monuments and zones shall apply to the fossil vestiges or remains of organic beings that inhabited our national territory in past epochs and whose research, conservation, restoration, recovery or utilization are of paleontological interest, the circumstance that must be specified in the respective declaration that the President of the Republic shall issue”.

The "Diario Oficial de la Federación", on January 13, 1986, published the reforms to the laws (Olivé, 2003). Whitt which the INAH is the federal government's regulatory agency that protects the Mexican paleontological heritage (García-Bárcena, 1993). Its Organic Law established that: "The Instituto Nacional de Antropología e Historia shall have the general goals of to protect, to preserve, to restore and to recover the paleontological heritage”.

In this way, INAH begins its mission of protecting paleontological heritage. The Department of Prehistory (currently known as the "Subdirección de Laboratorios y Apoyo Académico") was responsible for attending the inspections and the actions to recover and study the fossils, as part of the reports of fortuitous fossil finds. The authorization of national research projects and for foreign researchers, as well as permissions for the temporary export of paleontological materials, were under the responsibility of engineer Joaquín García Bárcena, Head of Pre-Hispanic Monuments, in collaboration with the "Dirección de Asuntos Jurídicos y Laborales" (Dirección de Monumentos Prehispánicos, 1986).

However, it was necessary to establish the actions to comply with the newly assigned entrustment, and for this reason in 1994, INAH General Directorate created the Council of Paleontology, a consultative-chartered organ that aimed to advise the same directorate in paleontological issues (Consejo de Paleontología, 1994).

A collaboration with the institutions that conducted paleontology projects was essential to establish in the short term. The formation of the Council included by different institutions. An invitation was sent to each institution's rectories through INAH General Directorate to appoint their representatives (Table 2).

The inaugural session was on May 24, 1994, in the facilities of the INAH General Directorate, located at this time at Córdoba No. 45, Colonia Roma, Mexico City. Although it was established in the Council regulations that sessions would be held monthly, they were held once a week

Table 2. Members of the Council of Paleontology during the period 1994-2000.

Regular Member	Position	Membership institution
Joaquín García-Bárcena González	president	INAH
Oscar Jorge Polaco Ramos	member	INAH
María Susana Xelhuantzi López	member	INAH
Luis Espinosa Arrubarrena	member	Universidad Nacional Autónoma de México
Beatriz Yolanda Contreras y Montero	member	Instituto Mexicano del Petróleo
Jaime Rueda Gaxiola	member	Instituto Politécnico Nacional
Francisco Javier Aranda Manteca	member	Universidad Autónoma de Baja California
Wolfgang Stinnesbeck Kutzner replaced by José Guadalupe López Oliva	member	Universidad Autónoma de Nuevo León
Jesús Gómez Serrano	member	Instituto Nacional de Estadística, Geografía e Informática
Ana Bertha Villaseñor Martínez replaced by Francisco Sour Tovar	member	Sociedad Mexicana de Paleontología

to fulfill the entrusted project (Consejo de Paleontología, 1994).

The main topics worked by the first Council were the proposal of definitions and a one recommendation for fossil categorization (e.g. essential, extraordinary and common fossils), paleontological monuments, classification of paleontological collections (e.g. scientific collection, non-scientific collection, educative collection), locality and paleontological area. In addition, proposals for the registration of localities and paleontological collections were developed (Consejo de Paleontología, 1994).

At the same time, the Council worked on the draft of the "Disposiciones Reglamentarias para la aplicación del artículo 28 BIS", concerning the paleontological heritage of the "Ley Federal de Monumentos y Zonas Arqueológicas, Artísticas e Históricas" This because of the considerable differences that existed between archaeological and paleontological heritage. It was not possible to apply the later normativity developed to the former and it was necessary the development of the normativity for paleontological heritage, according to its specific characteristics (García-Bárcena *et al.*, 1995).

In order to have a pertinent proposal with the needs of national paleontology, a first draft was presented at the Fifth National Congress of Paleontology of the Mexican Society of Paleontology in 1995, in order to receive contributions from the academic community (Consejo de Paleontología, 1994; García-Bárcena *et al.*, 1995). This project represented the basis for the generation of the documented named "Ley sobre vestigios y restos fósiles" [Law on Vestiges and Fossil Remains], presented for review to the Senate of the Republic, LVII Legislature of the Mexican Congress (Diario de los Debates de la Cámara de Senadores, 1998; Carreño and Montellano-Ballesteros, 2005).

Other developed activities included a review of research projects and the issuance of temporary export permissions. The last session of this first Council was on March 15, 2000, and there is no information on why they stopped its activity.

From 2000 to 2010, Joaquín García Bárcena, the then president of the Council of Paleontology, was in charge of the matters related to paleontological heritage, such as reviewing research projects and the issuance of temporary export permissions (Aguilar Arellano, 2019). In 2011, in the absence of Joaquín García Bárcena, different areas of INAH were in charge of the Council duties, depending on the topic. The "Consejo de Arqueología" reviewed research projects and temporary export permissions, and the registration of collections and localities by the "Dirección de Registro Público de Monumentos y Zonas Arqueológicas e Históricas" (Aguilar Arellano, 2019).

In the time where the first Council proposed of a several policies, the INAH administration continued to consider fossils like non-renewable natural resources and non-related to cultural heritage, so these should not be within the institute. Hence, its management was not a responsibility of INAH (Amador, 2004).

3. Reactivation of the Council of Paleontology of INAH

The Mexican paleontological heritage has always been in a very complicated situation due to the loss of paleontological deposits related to economic and urban activity, looting, and illicit trafficking. In addition, ethics lack in the recovery and investigation, loss of fossil specimens in collections, and insufficient budget for some

institutions, focused on creating and maintaining scientific collections (Aguilar Arellano, 2019; Abarzúa and Chávez, 2020), foment these current problems. For these reasons, it is essential to regulate paleontological activities.

Consequently, in 2011, the reactivation of the Council of Paleontology was considered the collaboration of representatives specialized in this discipline from different institutions, to develop and establish the applicable regulatory framework of the Article 28 BIS, and the administrative and legal procedures are leading to protect and safeguard Mexican paleontological heritage (Aguilar Arellano, 2019)

In March 2017, the director of INAH issued "Acuerdo de Creación del Consejo de Paleontología", and in May, is installed this chartered organ. The Council's principal role is to recommend to the INAH General Directorate about research, preservation, protection, science outreach, and management of paleontological vestiges and remains located in the national territory (INAH, 2017a).

The current Council of Paleontology (ConPal for its initials in Spanish, "Consejo de Paleontología") consists of a president, a secretary, twelve regular members, and twelve alternates (Table 3, Figure 1). The General Director is in charge of the president and regular members appointments. Regular members are the representatives designated by each institution's rectories (as in the previous Council); they received an INAH General Directorate invitation. Each regular member proposed its alternate, which is ratified in a plenary session of the Council; alternates have the same rights and obligations as those regulars (INAH, 2017a).

The ConPal celebrated its first session in May 2017 (INAH, 2017b), followed by bimonthly sessions and successive monthly sessions, working uninterruptedly



Figure 1. The Council of Paleontology on the first anniversary of its reinstatement. In the background, from left to right: Dr. Víctor M. Bravo Cuevas (UAEH), Dr. Eduardo Corona Martínez (Centro INAH Morelos), Dr. Joaquín Arroyo Cabrales (SLAA-INAH), Dr. José Ortega Ramírez, alternate member (SLAA-INAH), MsC. Guillermo Alvarado Valdez (UASLP), Antrop. Diego Prieto Hernández (Director General of INAH), MsC. Gerardo F. Carbot Chanona (Secretariat of the Environment of the State of Chiapas), Dr. Marcelo Aguilar Piña (IMP). Front, from left to right: Dra. Elena Centeno García (UNAM), Dra. Rosalía Guerrero Arenas (UMAR), Dra. Ma. Luisa García Zepeda (UMSNH), MsC. Felisa J. Aguilar Arellano (Centro INAH Coahuila), MsC. Cristina Corona Jamaica (Paleontology Subdirector, CNA-INAH), Dra. Angélica Oviedo García (UACH), Dra. Blanca E. Buitrón Sánchez (SOMEXPAL), May 25, 2018 (photo: Héctor Montaña, INAH).

for three years. During the first work period, its main priority was developing proposals for guidelines that allow applying current regulations and the definition of paleontological interest (Table 4). These documents are the result of collaboration with national and international specialists in the knowledge field. They are currently in the revision process to comply with the current provisions regarding regulatory documents for their future approval and application. Their definitive names and quantity may change according to the possible comments and adjustments they receive.

4. The Council of Paleontology of INAH, period 2017–2020

The principal role of the ConPal is to advise and provide support in decision-making to INAH General Directorate. To propose and contribute to other federal government agencies related to other uses that directly or indirectly involve fossils, taking as a basis the criteria to establish the paleontological interest of the fossil relics or remains of organic beings that inhabited the national territory in past epochs.

Although the creation of the ConPal sought to minimize the loss of paleontological assets by preparing proposals for regulations to apply the current legal framework, there are differences between the first stage of the Council and its reactivation. From 1994 to 2000, the Council analyzed

and discussed with the academic community (professors and researchers), paleontology amateurs, and even museum associations that exhibited fossils (Consejo de Paleontología, 1994). The proposals were only drafts without executed, as far as there is a record. The only procedure carried out to date was the issuance of temporary export permissions of fossils.

Otherwise, in this new stage, the ConPal carries out the research and preservation projects evaluations for movable and immovable paleontological assets, including their corresponding results reports; therefore, it is necessary to generate operational guidelines based on the current legal framework.

The evaluation guarantees that projects will be viable for their development if the proposed academic staff have experience in the research topic. The proposed recovery and restoration techniques are appropriate, and the proper safeguarding of paleontological specimens in a deposit site (Figure 2, Table 5). The ConPal to facilitate the proposals and submit their reports, a guide was elaborated ("Guía de requisitos mínimos para la presentación de informes y/o proyectos ante el ConPal"). Regular and alternate members check the revisions to each approach, as well as external evaluators, specialized in different taxonomic groups and applied aspects such as paleobiology, petrology, stratigraphy, paleoecology, paleoclimatology, geomorphology, sedimentology, paleobiogeography, isotopic geochemistry, among other areas.

The research process and science outreach activities involve the temporary movement of paleontological

Table 3. Regular and alternate members of the Council of Paleontology (2017-to the Present).

Regular member	Position	Institution	Alternate member	Institution	Period
Felisa Josefina Aguilar Arellano	president	INAH			20/04/17– Current
Gloria Cristina Corona Jamaica	secretary	INAH			20/04/17– 30/06/19
Joaquín Arroyo Cabrales	regular member	INAH	José Ruperto Ortega Ramírez	INAH	20/04/17– Current
Eduardo Corona Martínez	regular member	INAH	José Alberto Cruz Silva	<i>Benemérita Universidad Autónoma de Puebla</i>	20/04/17– Current
Elena Centeno García	regular member	<i>Universidad Nacional Autónoma de México</i>	Luis Espinosa Arrubarrena	<i>Universidad Nacional Autónoma de México</i>	20/04/17– Current
Marcelo Aguilar Piña	regular member	<i>Instituto Mexicano del Petróleo</i>	Aarón Del Valle Reyes	<i>Instituto Mexicano del Petróleo</i>	20/04/17– Current
Eduardo Limas García replaced by Angélica Oviedo García	regular member	<i>Universidad Autónoma de Chihuahua</i>	---		20/04/17– 06/10/17
Angélica Oviedo García	regular member	<i>Universidad Autónoma de Chihuahua</i>	Abelaid Loera Flores	<i>Secretaría de Innovación y Desarrollo Económico, Chihuahua</i>	08/01/18– Current
Elizabeth Chacón Baca	regular member	<i>Universidad Autónoma de Nuevo León</i>	Gabriel Chávez Cabello	<i>Universidad Autónoma de Nuevo León</i>	20/04/17– Current
María Luisa García Zepeda	regular member	<i>Universidad Michoacana de San Nicolás de Hidalgo</i>	Alejandro Hiram Marín Leyva	<i>Universidad Michoacana de San Nicolás de Hidalgo</i>	20/04/17– Current
Victor Manuel Bravo Cuevas	regular member	<i>Universidad Autónoma del Estado de Hidalgo</i>	Katia Adriana González Rodríguez	<i>Universidad Autónoma del Estado de Hidalgo</i>	20/04/17– Current
Rosalía Guerrero Arenas	regular member	<i>Universidad del Mar</i>	Eduardo Jiménez Hidalgo	<i>Universidad del Mar</i>	20/04/17– Current
Blanca Estela Buitrón Sánchez	regular member	<i>Sociedad Mexicana de Paleontología</i>	Jesús Alvarado Ortega	<i>Sociedad Mexicana de Paleontología</i>	20/04/17– Current
Guillermo Alvarado Valdez	regular member	<i>Universidad Autónoma de San Luis Potosí</i>	Gilberto Pérez Roldán	<i>Universidad Autónoma de San Luis Potosí</i>	20/04/17– Current
Gerardo Fabio Carbot Chanona	regular member	<i>Dirección de Gestión, Investigación y Educación Ambiental de Chiapas</i>	Manuel Javier Avendaño Gil	<i>Dirección de Gestión, Investigación y Educación Ambiental de Chiapas</i>	20/04/17– Current

Table 4. The proposals for Guidelines generated in the Council, these documents have been given priority as the regulatory framework associated with the implementation of existing legislation on the protection and conservation of paleontological heritage.

<i>Lineamientos para la investigación de vestigios o restos fósiles de interés paleontológico en México</i> [Guidelines for the research on fossil vestiges or remains of paleontological interest in Mexico]
<i>Criterios para establecer el interés paleontológico de los vestigios o restos fósiles de seres orgánicos que habitaron el territorio nacional en épocas pretéritas</i> [Criteria for establishing the paleontological interest of fossil vestiges or remains of organic beings that inhabited the national territory in past epochs]
<i>Lineamientos para la categorización y regulación de Colecciones paleontológicas en México</i> [Guidelines for categorizing and regulating paleontological collections in Mexico]
<i>Lineamientos de operación del Consejo de Paleontología del INAH</i> [Operation guidelines of The Council of Paleontology of INAH]
<i>Principios de ética del Consejo de Paleontología</i> [Ethical principles of the Council of Paleontology]
<i>Glosario de términos paleontológicos en materia patrimonial</i> [Glossary of paleontological terms in heritage matters]

material from one institution to another, both nationally and internationally, activities that regulated by law (Articles 29, 49 and 53 of the "Ley Federal de Monumentos y Zonas Arqueológicas, Artísticas e Históricas" and Article 37 bis sections I, II and III of its Regulations). In accordance with the current legal framework, a guide was prepared ("Guía para el traslado de bienes paleontológicos y de exportación de bienes paleontológicos"), contributing with the "Coordinación Nacional de Asuntos Jurídicos" the instance in charge of issuing the corresponding permissions.

The ConPal has established partnerships with the different areas of INAH with the aim of exchanging, helping and strengthening inter-agency relations through different activities. Several activities were coordinated with the "Dirección de Registro Público de Monumentos y Zonas Arqueológicas, Artísticas e Históricas". Like the validation of the parameters considered for the movable and immovable paleontological properties of the "Sistema Único de Registro Público de Monumentos y Zonas Arqueológicas e Históricas" (<https://registropublico.inah.gob.mx/index.php/autenticacion/autenticacion>).

The ConPal reviewed and approved of the "Cédula para identificar y catalogar localidades paleontológicas". The paleontological information of the cards submitted by people in charge of research projects for registration is revised with the agreement of the "Subdirección de Registro Público de Monumentos Arqueológicos Inmuebles". Finally, the Council supports the registration of collections (movable assets) in the custody of academic institutions or individuals. Furthermore, when other areas of the Institute requested a collaboration, the ConPal participated in paleontological

inspections, a task that has increased in the last two years (Figure 2).

The type of investigations that involve both movable and immovable paleontological assets can be diverse and include different disciplines. The analysis for each projects considering the point of view and according to the specialty. The ConPal review together with INAH advisory councils of each area, in the case of archaeological-paleontological investigations, it is reviewed jointly with the "Consejo de Arqueología". At the same time, if restoration-conservation activities, it is reviewed with the "Consejo de Conservación-restauración de monumentos muebles y muebles asociados a inmuebles competencia del INAH".

5. Identity, academic and science outreach events

The ConPal has an imago type, created to promote and recognize its presence in the different activities carried out individually or in collaboration. It consists of four different fossils from the Paleozoic, Mesozoic, and Cenozoic eras. These fossils represent the paleontological diversity

Table 5. INAH departments and academic institutions with current projects related to the study or conservation of fossils or paleontological sites.

Institutions with a project authorized by ConPal	Institution headquarters	State in which the project is running
1.Coordinación Nacional de Conservación del Patrimonio Cultural, INAH	Mexico City	Nayarit and Jalisco
2. Dirección de Salvamento, INAH	Mexico City	State of Mexico
3.Dirección de Operación de Sitios, INAH	Mexico City	Coahuila
4. Subdirección de Laboratorios y Apoyo Académico, INAH	Mexico City	Michoacán and State of Mexico
5. Escuela Nacional de Conservación, Restauración y Museografía, INAH	Mexico City	Coahuila
6. Centro INAH Baja California	Baja California	Baja California
7. Centro INAH Baja California Sur	Baja California Sur	Baja California Sur
8. Centro INAH Sonora	Sonora	Sonora
9. Centro INAH Coahuila	Coahuila	Coahuila
10. Centro INAH Michoacán	Michoacán	Michoacán
11. Centro INAH Puebla	Puebla	Oaxaca
12. Estación Regional del Noroeste, IG, UNAM	Sonora	Sonora
13. Instituto de Geología, UNAM	Mexico City	Sonora
14. Universidad Michoacana de San Nicolás de Hidalgo	Michoacán	Michoacán
15.Universidad Autónoma del Estado de Hidalgo	Hidalgo	Sonora
16. Benemérita Universidad Autónoma de Puebla	Puebla	Puebla

Note: It is essential to highlight the participation of the different areas of the National Institute of Anthropology and History to register their projects and have the approval of the Council of Paleontology. Some other academic entities are also participating; however, there is still little participation.

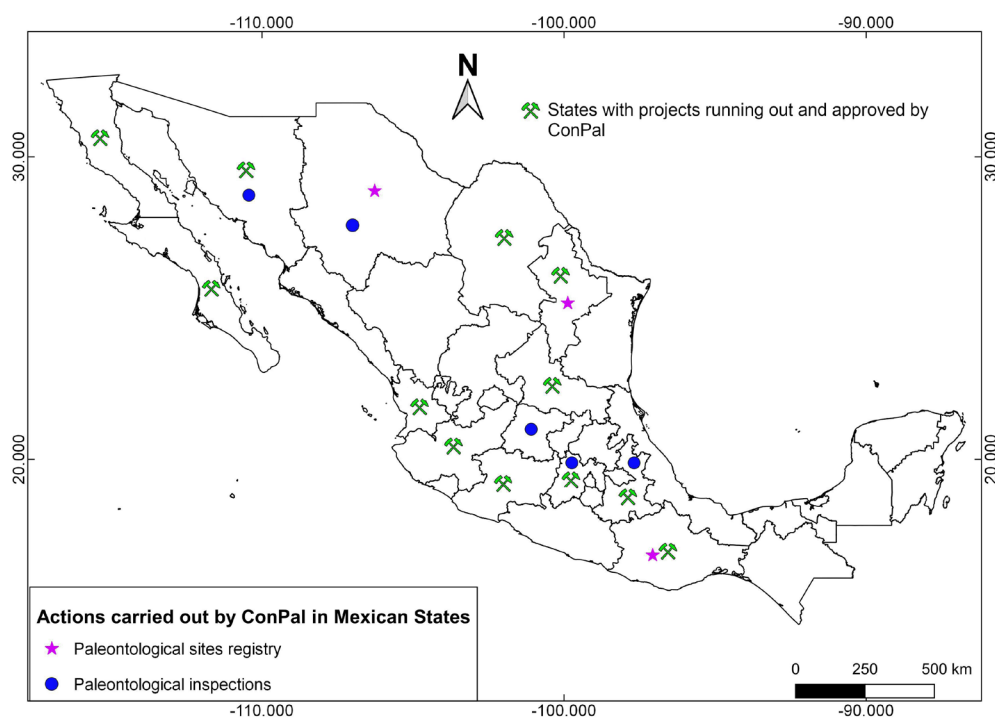


Figure 2. The states of the Mexican Republic are shown where research activities authorized by the Council of Paleontology are carried out, are shown, and the states where inspections have collaborated.

in our country and the heterogeneity of specialties and taxonomic groups investigated by the members of the ConPal (Figure 3). Since August 2019, the microsite www.consejopaleontologia.inah.gov.mx is available. It aims to inform the academic community, students and interested people on regulations, the movable and immovable paleontological heritage procedures, the calendar of ConPal regular meetings, and science outreach events.

Regarding dissemination and popularization of Paleontology, the ConPal considers that dialogue with the academic community and the society is essential. As a result, different proposals for participation in academic events have been generated to show the proposed regulations' work and progress and enrich them (Table 6). The science outreach events promote knowledge of paleobiodiversity, as well as meaning that society recognizes the value of fossils not only as a source of information about the past but also as identity promoters by being part of the local cultural and natural local heritage (Aguilar and Polaco, 2005) (Table 7).

Considering that paleontological assets have a double meaning, the ConPal has established guidelines to make known, understanding, evaluating, and acting on it as a source of research and heritage. To propose the most appropriate and inclusive normative procedures to the real and current conditions of paleontological research, and must be based on the results of success or failure. It has been crucial to encourage knowledge of heritage at the social level. Hence, the importance of opening for exhibitions and conferences open to the public.

6. Conclusions

The panorama for the management of paleontological heritage in Mexico remains complex. Although it is equated with the archaeological heritage in the legal framework, we recognized that the only point in common is that both are underground. However, the methods for their exploration, recovery, and analysis are different due to the particular characteristics of the fossils, taking into account the great paleobiodiversity and time scale that makes it up, so it is necessary to establish fair rules for their management.

It is essential to incentivize (in the academic community and society) the importance of recognizing fossils as heritage and not conceiving them only as objects of study or the environment's components. Therefore, the development of science outreach activities in open forums and academic events is essential besides knowing and understanding the value of fossils and paleontological deposits to create a commitment to preserve and protect our heritage.

It is essential to strengthening inter-institutional relations between paleontological research centers and INAH. It is also crucial the participation of scientists by registering their projects, to know who are the main actors researching in the country, and that the conditions of in situ extraction, restoration, and safeguarding or preservation, as the case may be, are the most suitable for the safeguarding of paleontological assets. The registry of collections and paleontological sites is essential. To establish

Table 6. Academic events in which ConPal has participated.

Title	Contribution	Academic event	Date	Venue
<i>Los fósiles son patrimonio: Reflexiones sobre la normatividad y la legislación en México.</i>	Panel discussion	XV Congreso Nacional de Paleontología SOMEXPAL	June 26–30, 2017	San Luis Potosí, Mexico
<i>Misión del INAH como garante de la salvaguarda del patrimonio paleontológico, arqueológico e histórico (Bienes paleontológicos y Consejo de Paleontología)</i>	Conference	Protección y tutela del patrimonio cultural INAH-PGR	August 27 – September 01, 2017	Mexico City, Mexico
<i>Bienes muebles e inmuebles paleontológicos</i>	Oral presentation	Seminario sobre investigación, conservación, restauración y puesta en valor del Patrimonio Paleontológico	September 18–23, 2017	Mexico City and Hermosillo, Sonora, Mexico
<i>Los bienes paleontológicos contenidos en los museos de México</i>	Poster presentation			
<i>De las palabras a los hechos, el significado de los fósiles marinos y su apropiación como patrimonio, el caso de El Madroño, Querétaro.</i>	Oral presentation	XXXI Mesa redonda El norte de México y el sur de Estados Unidos: de los espacios fluidos a los procesos posglobales	October 02–06, 2017	Ensenada, Baja California, Mexico
<i>Consejo de Paleontología</i>	Poster presentation	XXXIII Semana de la Biología, UNICACH.	September 24–29, 2018	Chiapas, Mexico
<i>Consejo de Paleontología</i>	Poster presentation	Congreso Mexicano del Petróleo	September 26–29, 2018	Guerrero, Mexico
<i>Primera semana de divulgación paleontológica</i>	Serie of conferences	Primera semana de Divulgación Paleontológica del Consejo de Paleontología, Universidad del Mar	November 26–29, 2018	Oaxaca, Mexico
INAH's paleontological council and its role in preserving the Mexican heritage	Poster presentation	1st Palaeontological Virtual Congress	December 01–15, 2018	Virtual event
La reactivación del Consejo de Paleontología del INAH y su papel en la paleontología en México	Oral presentation	X Congreso Latinoamericano de Paleontología	February 04–06, 2019	El Salvador, San Salvador
Situación actual y perspectivas del Consejo de Paleontología con énfasis en la clasificación de los fósiles	Panel discussion	Convención Geológica Nacional	April 08–11, 2019	Mexico City, Mexico
INAH'S Paleontological Council and It's role in preserving the Mexican heritage	Poster presentation	84 th Annual meeting Society for American Archaeology	April 10–14, 2019	New Mexico, USA
Towards a Mexican protection of paleontological resources	Poster presentation	11 th North American Paleontological Convention	June 23–27, 2019	California, USA
Consejo de Paleontología: reglamentación en México	Oral presentation	Primer ciclo de conferencias del Cedral, S.L.P., México	September 7–8, 2019	San Luis Potosí, Mexico
Situación actual y perspectivas del Consejo de Paleontología (INAH) con énfasis en la clasificación de los fósiles	Panel discussion	XVI Congreso Nacional de Paleontología, SOMEXPAL	September 30 – October 04, 2019	Chihuahua, Mexico
Taller informativo sobre los procedimientos que realiza el Consejo de Paleontología	Dissemination workshop	XVI Congreso Nacional de Paleontología, SOMEXPAL	September 30 – October 04, 2019	Chihuahua, Mexico
El Consejo de Paleontología y la difusión divulgación de su quehacer científico	Oral presentation	Reunión Anual de la Unión Geofísica Mexicana 2019	October 27 – November 01, 2019	Jalisco, Mexico
La paleontología en México, el INAH y el papel del ConPal	Oral presentation	XX Encuentro Binacional Balances y Perspectivas de la Antropología e Historia de Baja California	November 22–23, 2019	Baja California, Mexico
II Jornada de difusión del Consejo de Paleontología	Serie of conferences, Panel discussion, Dissemination workshop, and Temporary exhibition	II Jornada de Difusión del Consejo de Paleontología, Universidad Autónoma del Estado de Hidalgo	November 27–28, 2019	Hidalgo, México

Table 7. Science outreach events organized by ConPal or in collaboration with other institutions.

Title	Contribution	Event	Date	Venue
Ámbar, la joya que atrapó el tiempo	Conference	<i>150 años de la Sociedad de Historia Natural en México</i>	25-Oct-18	Museo Nacional de las Culturas del Mundo, Mexico City, Mexico
Mamíferos del Pleistoceno tardío	Conference		26-Oct-18	
Un “consejo para la paleontología mexicana”	Panel discussion		27-Oct-18	
El INAH y la paleontología mexicana I	Series of conferences	<i>El INAH y la paleontología mexicana</i>	March 28–30, 2019	Museo Nacional de las Culturas del Mundo, Mexico City, Mexico
El INAH y la paleontología mexicana II			April 24–26, 2019	
El INAH y la paleontología mexicana III			June 13–14, and 20–21, 2019	
El INAH y la paleontología mexicana IV			August 15–16, 2019	
El INAH y la paleontología mexicana V			September 19–20, 2019	
El INAH y la paleontología mexicana VI			October 17, 24 and 26, 2019	
Palinología, la historia que nos cuentan los granos de polen			Workshop	
Sonidos y Sentidos	Workshop	<i>El INAH y la paleontología mexicana</i>	June 08 and 15; August 10, 2019	Museo Nacional de las Culturas del Mundo, Mexico City, Mexico
El INAH y la paleontología mexicana	Temporary exhibition	<i>El INAH y la paleontología mexicana</i>	March 28, 2019- to the present	Museo Nacional de las Culturas del Mundo, Mexico City, Mexico
Un “Consejo” para la paleontología mexicana	Series of conferences		29-Aug-19	Escuela Nacional de Antropología e Historia, Mexico City, Mexico
Un “Consejo” para la paleontología mexicana	Temporary exhibition		23-May-19	Universidad Michoacana de San Nicolás de Hidalgo, Morelia City, Michoacan
			27-May-19	Escuela Nacional de Estudios Superiores, UNAM, campus Morelia, Morelia City, Michoacan
			June 07–28, 2019	Museo del Instituto de Geología, UNAM, Mexico City, Mexico
			August 29 – September 06, 2019	Escuela Nacional de Antropología e Historia, Mexico City, Mexico
			September 30 – October 04, 2019	XVI Congreso Nacional de Paleontología, Chihuahua City, Chihuahua
			22-Oct-19	Museo de Paleontología Eliseos Palacios Aguilera, Tuxtla Gutierrez City, Chiapas
¿Cómo analizar un hallazgo fósil?, La importancia del contexto y el registro durante la recuperación	Conference	<i>La prehistoria se abre entre nosotros</i>	25-Jan-20	Museo el Mamut, Tultepec, State of Mexico
Los fósiles y sus historias, lo que me cuentan de mi tierra	Conference	<i>Tercera Jornada comunitaria de arqueología participativa del Centro INAH Estado de México</i>	6-Mar-20	Cabecera municipal de Luvianos, State of Mexico
Lo que las huellas nos cuentan	Workshop			
Las mujeres y la paleontología	Serie of conferences		March 12–13, 2020	Museo Nacional de las Culturas del Mundo, Mexico City, Mexico



Figure 3. Imagotype of the Council of Paleontology of INAH includes an ammonite, a fern, a foraminifera and a fish, elaborated by Norma Lara Barajas, ConPal staff.

adequate protection, the ConPal must know the type of paleontological heritage and its state of conservation. In this way, it will be possible to minimize the looting, illicit trafficking, or loss of fossils extracted in national territory, by amateurs or by personnel outside Mexican academic institutions. The damage and loss of fossils are irreversible and represents a double loss: the subject of study and an element of national heritage.

It is important to emphasize that the presence of the Council of Paleontology in INAH must be permanent and that development, in both research and management of paleontological heritage, is an area that must be strengthened inside the same institute. We suggest that it should have an operational area within its organization chart in addition to having the Council. The necessary tools are also provided to comply with the assigned entrust, not to mention the various problems the federal government faces, including budget cuts and some other shortcomings that sometimes become more aggressive.

The ConPal aims to maintain and adapt based on the needs of the paleontological heritage. The work lines focused on the academic community and society, with the certainty that the recognition of fossils and their deposits will be part of Mexico's cultural and natural heritage over time.

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