

## MONARCH BUTTERFLY CONSERVATION FUND

Eligio García Serrano<sup>a</sup>, Juan Manuel Frausto Leyva<sup>b</sup> y Karina Ugarte<sup>b</sup>

<sup>a</sup>Fondo para la Conservación de la Mariposa Monarca. Héroes Ferrocarrileros No. 1, Col. Héroes Ferrocarrileros, CP. 61506, Zitácuaro, Michoacán.  
Email: [fondo.monarca@yahoo.com.mx](mailto:fondo.monarca@yahoo.com.mx)

<sup>b</sup>Fondo Mexicano para la Conservación de la Naturaleza A.C. Damas 49, Col. San José Insurgentes, CP. 03900, México, D.F.. Email: [juan.frausto@fmcn.org](mailto:juan.frausto@fmcn.org) y [karina.ugarte@fmcn.org](mailto:karina.ugarte@fmcn.org)

### 1. INTRODUCTION

#### *1.1. The Payment for Environmental Services and Concurrent Funds Program: A National Forestry Commission Public Policy.*

Environmental services are the conditions and processes through which natural ecosystems, and the species that form them, maintain and satisfy human life (Daily, 1997). An example of these services provided by nature is the provision of water by forests. One strategy for maintaining these environmental services is to pay people, usually the landowners, to conserve them. Payment for environmental services (PES) is an important tool for promoting the conservation of natural and wild habitats (Ferraro and Kiss, 2002) and consists of beneficiaries of environmental services (ES) paying directly, contractually and conditionally, to the owners who provide them, for adopting practices that ensure the conservation and restoration of the ecosystems that generate these environmental services (Wunder, 2006).

In Mexico, the National Forestry Commission (Conafor) has been responsible for the Environmental Hydrological Services Program (PSAH) since 2003. This program is the result of the reform of Article 223 of the Federal Law of Rights, through which the National Water Commission annually transfers a portion of the 300 million pesos collected from large water users to the Mexican Forest Fund to operate this program.

Through this program, Conafor promotes the creation of Local Payment for Environmental Services Mechanisms. This platform facilitates the transfer of monetary resources from users to forest landowners where water is captured and infiltrated. It also promotes the adoption of good land management and conservation activities that allow the maintenance and/or improvement of the provision of hydrological environmental services with a watershed approach.

In order to strengthen the Local Mechanisms of Payment for Environmental Services, Conafor encourages the development of Concurrent Funds by calling upon users of environmental services to make financial contributions to support the implementation of good management practices for the conservation and restoration of forest ecosystems.

In 2008, seven agreements of this type were signed, ranging in duration from one to ten years, committing joint contributions of more than 77 million pesos and the incorporation of nearly 26,000 hectares into PES. For 2009, 13 new agreements were incorporated committing contributions of more than 88 million pesos to cover more than 95,000 hectares in local PES schemes (Graf and Bauche, 2010).

Among the most outstanding cases of these agreements is the Concurrent Fund with the Mexican Fund for the Conservation of Nature A.C. (FMCN), signed in 2008 under the umbrella of the Monarch Fund. This agreement has three objectives:

- i) Protect the upper parts of the Cutzamala watershed system;
- ii) Conserve the forests of the core areas of the Monarch Butterfly Biosphere Reserve and;
- iii) Preserve the phenomenon of migration and hibernation of the Monarch Butterfly (*Danaus plexippus*).

This effort will be carried out for a period of 18 years (2009 - 2026) for an agreed total amount of more than \$120 million pesos. Conafor will contribute \$55.9 million and FMCN \$64.3 million and will benefit 38 properties in the states of Mexico and Michoacán (Conafor, 2013). With this strategy, three-quarters of the properties, which represent more than 73% of the surface area of the core zone (9,928 hectares), are financially compensated by the Monarch Fund and the Concurrent Funds (Figure 1) (Conafor, 2013).

### *1.2. The Monarch Butterfly Conservation Fund: A financial instrument for biodiversity conservation in the core areas of the Monarch Butterfly Biosphere Reserve.*

The Monarch Butterfly Conservation Fund (FM) is a conservation strategy based on economic incentives for forest owners in the core areas of the Monarch Butterfly Biosphere Reserve (MBBR). It began with payments for the transfer of forest use rights acquired prior to the publication of the Reserve's decree on November 10, 2000, at the rate of \$18 per cubic meter of timber and \$12 per hectare subject to conservation. The payments for forest use rights ended in 2008, which allowed the transition to a PES scheme based on the area conserved, increasing the amount with Conafor's contributions.

The Monarch Fund was created as an endowment within the FMCN with contributions of US\$7.5 million from the Packard Foundation, the Ministry of the Environment in Mexico, and the governments of the State of Mexico and Michoacan (Table 1). This patrimony is given financial management to generate annual interest that is transferred annually to a trust. Each year, the Technical Committee of this trust identifies the land that has not been deforested and grants payments to a maximum of 34 ejidos<sup>1</sup>, indigenous communities and private properties out of the 38 included in the core zones of the MBBR.

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<sup>1</sup> agricultural and forestry properties for collective use.

Donante	Aportación \$USD	%
Fundación Packard	5,000,000.00	65.83
SEMARNAP	1,000,000.00	13.17
Estado de México	1,345,270.46	17.71
Estado de Michoacán	250,017.29	3.29
<b>TOTAL</b>	<b>7,595,287.75</b>	<b>100%</b>

Table 1. Integration of the Monarch Fund's Endowment.

This financial mechanism arose from an initiative of the FMCN and the World Wide Fund for Nature (WWF), with the participation of the Ministry of the Environment, Natural Resources and Fisheries (Semarnap), the National Commission on Natural Protected Areas (CONANP) as the environmental authority of Mexico and the ejidos and communities. It is based on an agreement signed in October 2000, a supplementary agreement signed in July 2001 and the trust agreement signed in June 2002, with the original participation of 31 of the 38 property owners in the core area of the MBBR.

Total FM investment over 17 years has reached about 54.8 million Mexican pesos, of which about 33% has been invested in 11 farms in the State of Mexico and 67% in 23 farms in the State of Michoacan (Figure 1). The resources granted are related to the area of each property and the conservation of its forest cover.

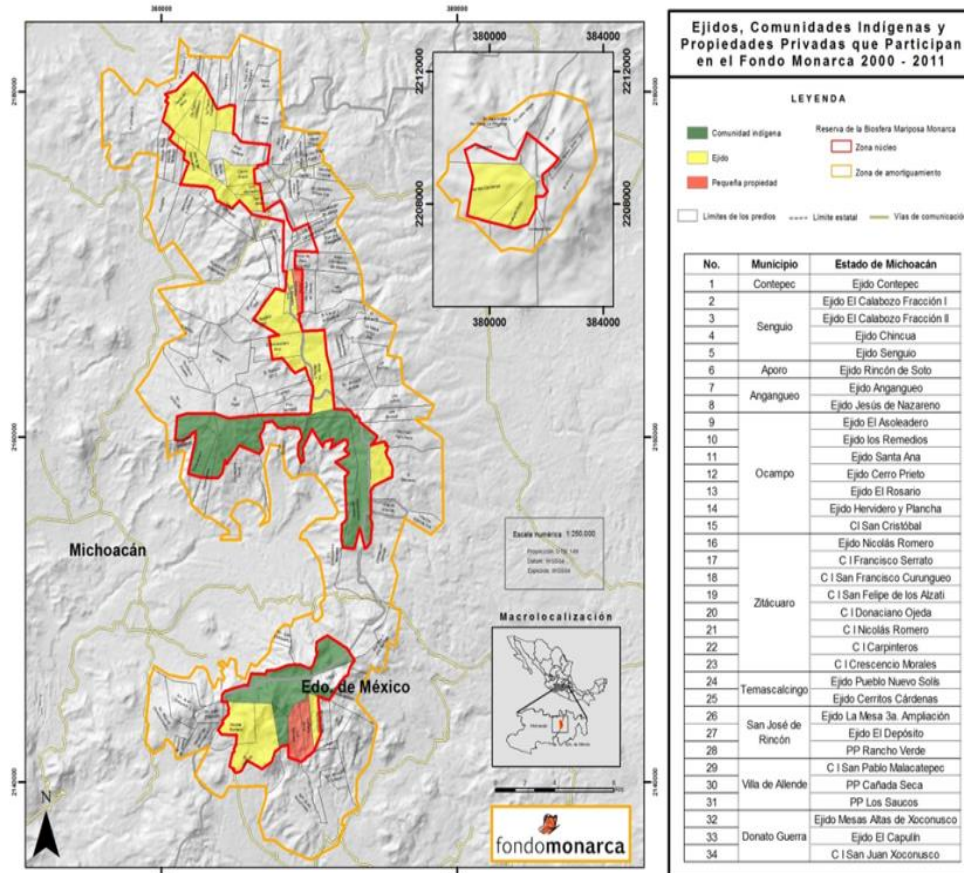


Figure 1. Ejidos, Indigenous Communities and Private Property participating in the Monarch Fund.

1.3. The core areas of the Monarch Butterfly Biosphere Reserve: A strategic site for the conservation of the forest, water and the migration and hibernation of the Monarch Butterfly.

The MBBR is located on the borders of the states of Mexico and Michoacan (Figure 2). It has an area of 56,259 hectares, divided into three core zones (13,551 ha) and two buffer zones (42,707 ha) (Conanp, 2001). It stands out as a priority region for the conservation of the migratory phenomenon of the Monarch Butterfly (*Danaus plexippus*) in North America. This area is recognized as a Priority Terrestrial and Hydrological Region by the National Commission for the Knowledge and Use of Biodiversity (CONABIO).

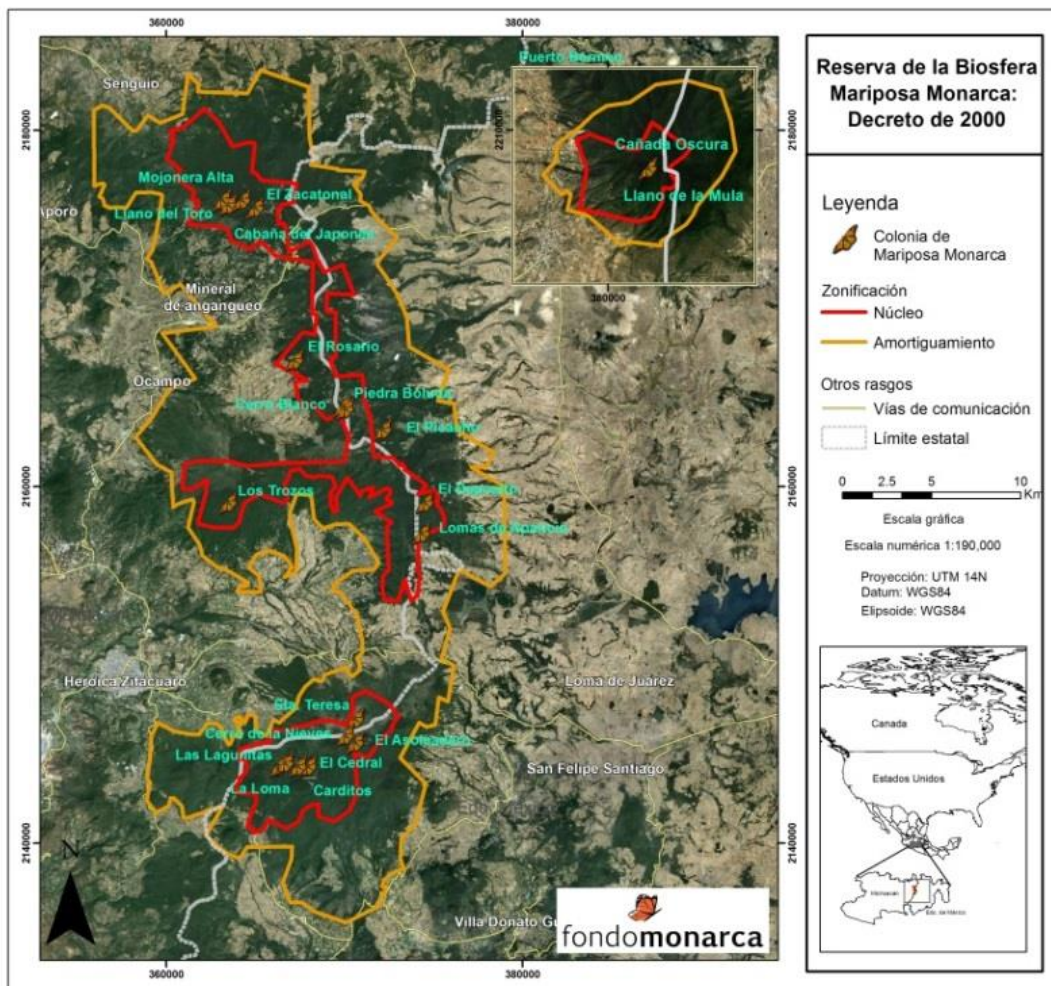


Figure 2. Location of the Monarch Butterfly Biosphere Reserve.

At the international level, MBBR joined the World Network of Biosphere Reserves of UNESCO's<sup>2</sup> Man and the Biosphere Programme in 2006 and was declared a World Natural Heritage Site by the same organization in 2008. By 1998 it had already been recognized as an Important Bird Area (AICAS), located in a critically endangered ecoregion.

<sup>2</sup> United Nations Educational, Scientific and Cultural Organization

From the point of view of the provision of ecosystem services, the MBBR is part of two of the country's largest and most important watersheds: the Lerma River Watershed and the Balsas River Watershed. These watersheds contribute 30% of the water that supplies Mexico City (Conagua, 2005; Conafor, 2010).

The social property in the core zones of the RBMM is composed of 23 ejidos that comprises 56% of the land; 10 indigenous communities who own 30% of the land, 6 private properties that represent 8% of the area, a federal zone 4%, a state zone, 1% and a disputed area, 2%. (Figure 3).

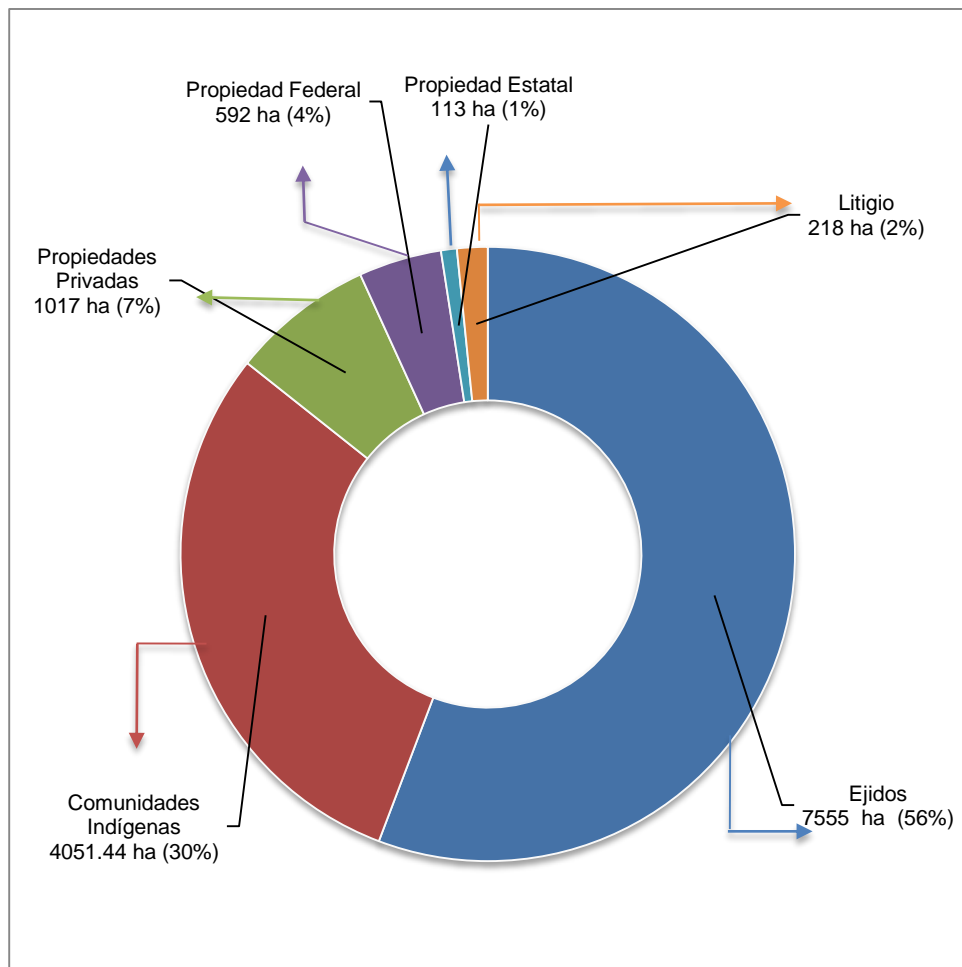


Figura 3. Distribution of social ownership in the core areas of the RBMM

PESs to forest owners participating in the Monarch Fund depend on the forest cover of the land. This is monitored every year with analysis of aerial photographs or satellite images. These analyses show that between 2003 and 2009 there was a recovery of 722 hectares of forest in core areas of the MBBR. In 2009, 48% of the core areas were covered by forests with closed cover, 13.9% with semi-closed cover, 11% semi-open, 5.5% open, 3.9% very open, 11.8% deforested and 5.3% recovering (Figure 4).

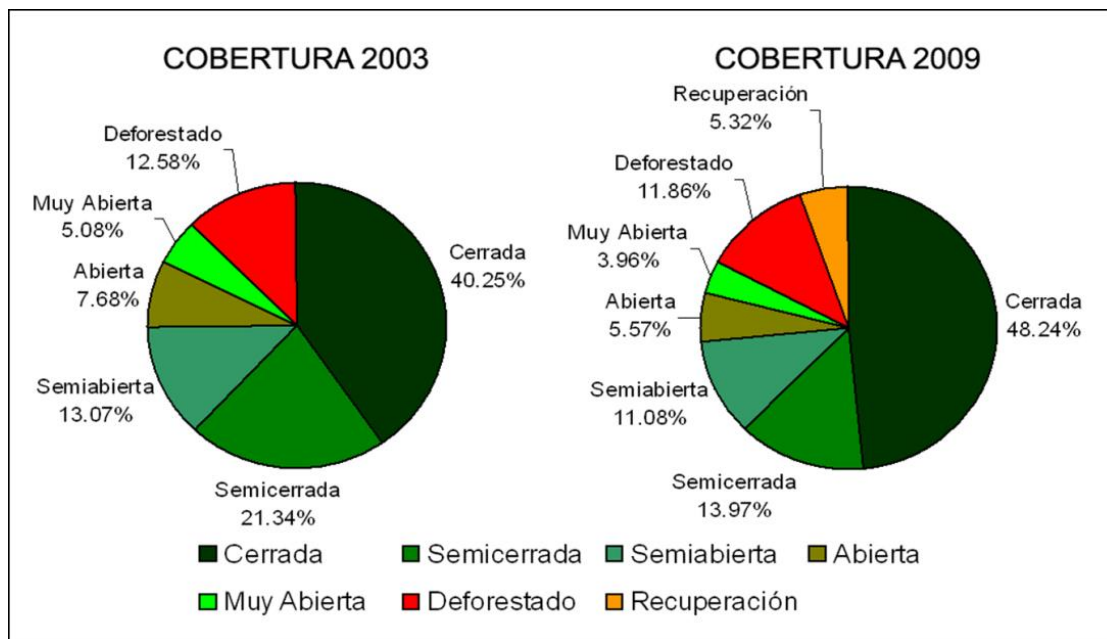


Figure 4. Forest cover in the core areas of the GMRN (Source: Forest Baseline 2009).

## 2. ACHIEVEMENTS OF THE MONARCH FUND

2.1. *There is a clear institutional framework that facilitates the operation of the Monarch Fund in the field.*

FM is part of FMCN's Fund for Natural Protected Areas (FANP), a public-private initiative between FMCN, the Government of Mexico and the World Bank. The FANP consists of endowment resources, whose interests are channeled to 30 priority natural protected areas in the country.

FANP has a Technical Committee of the FANP (CTFANP) that oversees its operation, including the FM. This Committee is composed of seven members from different sectors, who are appointed by the National Council of Natural Protected Areas and ratified by the FMCN Board of Directors.

Another component of the FM is the Monarch Fund Trust Technical Committee (CTFMM), which approves annual payments to ejidos and communities that have complied with forest cover conservation in core areas (Figure 5). Six representatives of ejidos, indigenous communities and private landowners participate in the CTFMM.

***The FM sets a precedent in Mexico for being the first endowment fund whose interests directly support the owners of a federal protected natural area in the long term.***

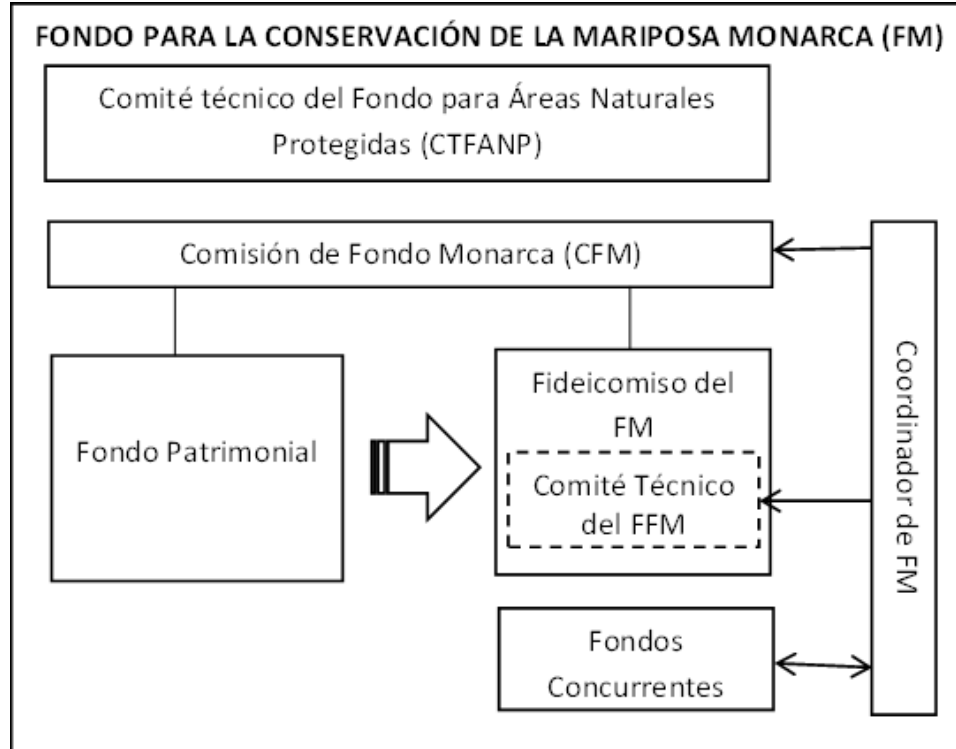


Figure 5. Structure and functioning of Monarch Fund

## 2.2. Increased support for forest conservation in the core areas of the MBBR.

Long-term institutional arrangements give communities confidence and transparency in the exercise of resources. These two elements are essential in reducing forest degradation and deforestation. In addition, having an endowment fund has made possible to obtain additional resources from Conafor for a period of 18 years (2009 - 2026).

On December 19, 2008, FMCN and Conafor signed a ten-year collaboration agreement (2009-2018) to implement a support strategy under a concurrent funding scheme for ejidos, communities and private properties with core zones in the RBMM. FM increased the payment from \$12 dollars to \$341.83 pesos per hectare (ha) in well-conserved forest and Conafor agreed to grant the same amount to the owners. With this new scheme the ejidos, communities and private properties received \$683.66 pesos per hectare in forests with coverage above 50%; this meant that the payment originally received for the conservation of their forests quadrupled with the Concurrent Funds scheme (Figure 6). The investment in this stage was \$61,935,752.

Four years later, FMCN and Conafor signed an addendum to the collaboration agreement to promote local mechanisms for payment for environmental services through concurrent funds. In this third stage, the addendum extended the agreement to 2026, with an investment that will reach 100 million pesos in the next 18 years.

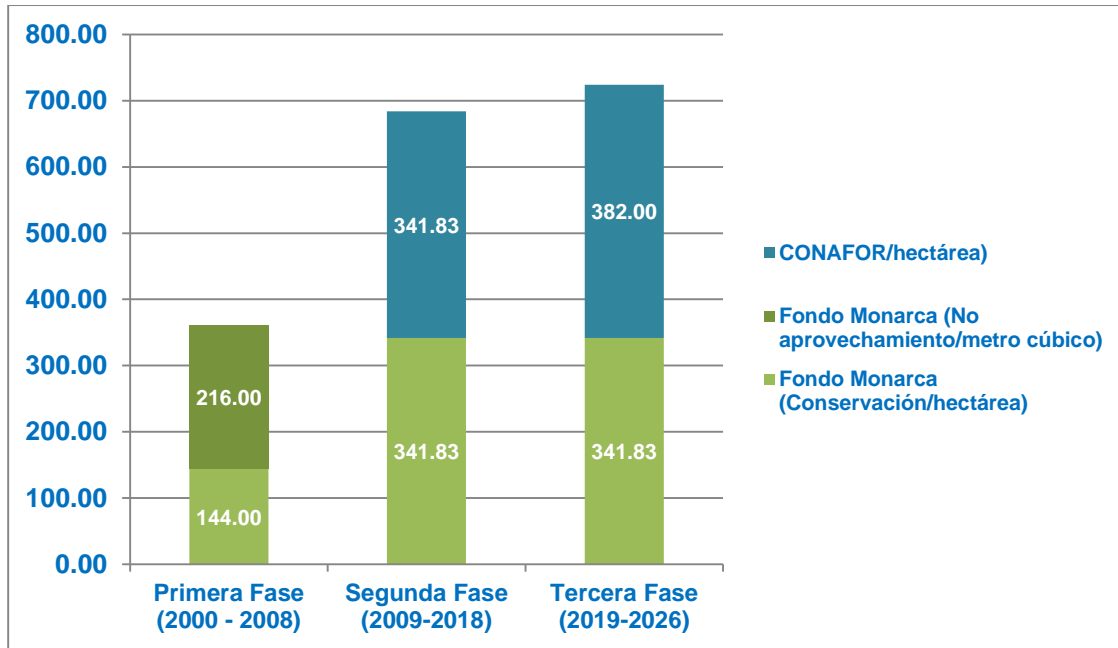


Figure 6. Payment schemes in the new phase of the Monarch Fund (2009 - 2026).

### 2.3. Decreased forest degradation in core areas of the MBBR.

A complex combination of threats has contributed to the deterioration of the Monarch Butterfly migration phenomenon over the years. However, trilateral scientific meetings indicate that the main threats to the Monarch Butterfly in North America are:

- i. Impact of glyphosate use on the host plant of the monarch butterfly and its effect on the decline of the population of the butterfly.
- ii. Impact of illegal logging on hibernating habitat in the Monarch Butterfly Biosphere Reserve.
- iii. Impact of adverse weather conditions and climate change.

Of the threats identified by experts, the impact of illegal logging on hibernating habitat in the Monarch Butterfly Biosphere Reserve has decreased significantly. This is shown in the results of WWF's annual monitoring of coverage change in the core areas of the RBMM under FM (Figure 7).

This achievement has been the result of the coordinated work of the federal environmental authority (Semarnat, Conanp, Conafor and Profepa), the governments of the states of Mexico and Michoacan, FMCN, WWF and the ejidos, indigenous communities and owners of the core zones that supported the establishment of the Monarch Fund and leveraging Concurrent Funds to double the payment per hectare conserved in the core zones of the MBBR.

Scientific data reveal that the Monarch Fund has been successful in reducing degradation and deforestation rates in the GMR. Honey-Roses et al (2011) found evidence that the combination of legal protection of the area (natural protected area decree) and financial incentives provided by the FM have supported the conservation of the Monarch Butterfly's wintering forests. These



authors estimate that, although 9% of the areas with logging bans have been deforested since 1993 and 15% of dense forests have disappeared, the loss would have reached an additional 3% and 11%, respectively, without the existence of these protection instruments and incentives. The study makes a detailed comparison with the dynamics observed in surrounding areas that do not have these tools.

**These results are a strong indication that financial mechanisms in support of conservation, coordinated with the work of many institutions pursuing the same objective, are an essential part of the formula for reducing deforestation.**

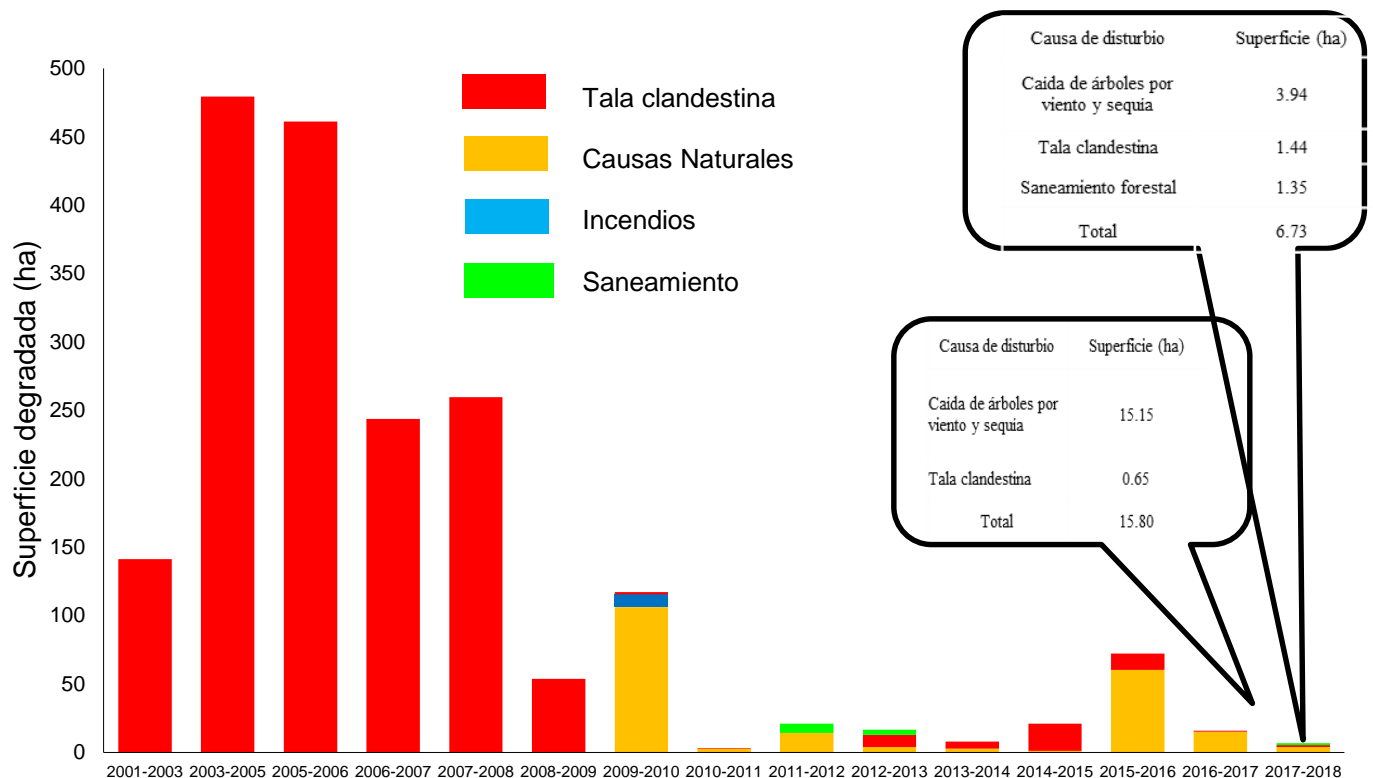


Figure 7. Forest degradation in core areas of the Monarch Butterfly Biosphere Reserve 2001-2018.

#### 2.4. Local capacity building and communication.

On the other hand, the FM strengthens the local capacities of 33 ejidos and communities to comply with the fiscal and banking conditions related to annual conservation payments under the concurrent funds' modality. In collaboration with Conafor, Conanp, FMCN and forest advisors, the FM supports the development of 29 Best Management Practices for Conservation Programs (BMPCP). The BMPCP is intended to be a document to guide the implementation of activities aimed at the conservation of forest ecosystems, in order to maintain or improve the provision of environmental services within areas under financial incentives. In addition, the BMPCP are intended to enable beneficiaries to obtain resources from other government programs to carry out the activities proposed in them (Figure 8).

In order to strengthen the FM strategy within the ejidos and communities, the FM Coordinator accompanied the design of dissemination materials with information on the new stage of the FM (Figure 9). Finally, the FMCN, in coordination with the United States Forest Service and the Monarch Network, supports complementary conservation activities in the core areas in the areas of fire management, water monitoring, fire protection and restoration of degraded areas.

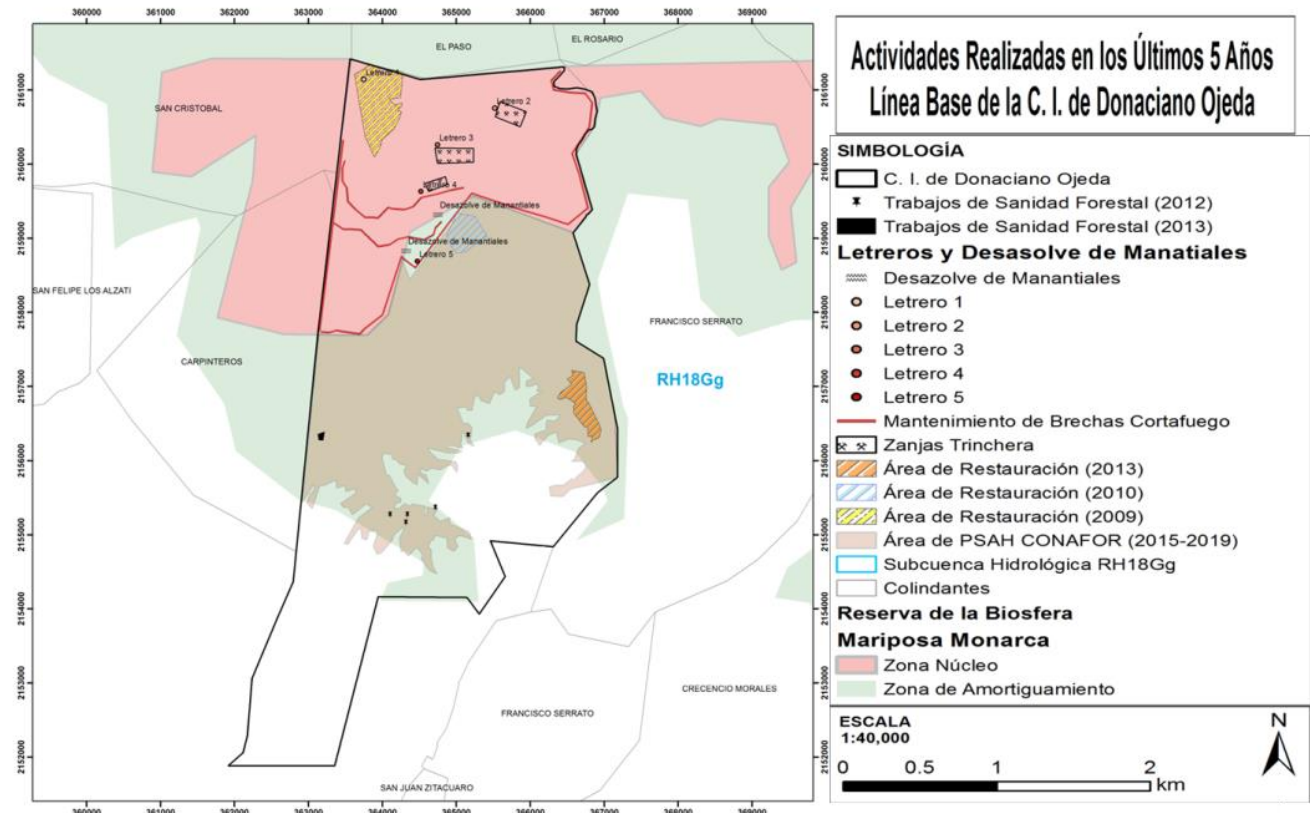


Figure 8. Baseline of the BMPCP of the Donaciano Ojeda Indigenous Community, Municipality of Zitacuaro, Michoacan.

As proposed in the case study Funding for Forest and Biodiversity Conservation in the Monarch Butterfly Biosphere Reserve: the Monarch Fund, in the future, we must maintain recognition that forests play an essential role in the generation of the environmental services provided by the MBBR, so that the conservation of core areas is a very important component. However, it must be made clear that "the maintenance of ecosystem services also requires ensuring the sustainable use of the territory throughout the protected natural area and its immediate area of influence" (Frausto, 2010). Achieving this status requires more comprehensive management based on the increased capacities of ejidos and communities, institutional synergy and long-term intergovernmental cooperation.

## fondomonarca

### Nueva etapa (2009-2026)

Como fue acordado en un inicio, el Fondo Monarca seguirá apoyando a los dueños de predios en las Zonas Núcleo de la Reserva de la Biosfera Mariposa Monarca, a razón de 12 dólares por hectárea por año, siempre y cuando cuiden el bosque.

Además, algo muy importante en esta nueva etapa es que en 2008 el Fondo Monarca acordó con la Comisión Nacional Forestal (CONAFOR) que este apoyo pueda aumentar en la superficie con bosque bien conservado.

El Fondo Monarca podrá subir el pago de 12 dólares a 341.83 pesos por hectárea de bosque bien conservado y la CONAFOR pondrá la misma cantidad para que sea mayor el pago a los dueños de los predios por la conservación de sus bosques en las Zonas Núcleo.

A eso se le llama "Fondos Concurrentes"

**ESQUEMAS DE PAGO EN LA NUEVA ETAPA DEL FONDO MONARCA (2009 - 2026)**

Propietarios con terrenos en zona núcleo	Etapas	Con bosques que presentan una cobertura forestal mayor al 50%	Con bosques que presentan una cobertura forestal menor al 50%
Signatarios del Fondo Monarca	2009-2018	341.83 pesos por hectárea pagados por la CONAFOR (más el apoyo con asistencia técnica a partir de 2012)	12 dólares por hectárea de estos terrenos pagados por el Fondo Monarca
	2019-2026	382.00 pesos por hectárea pagados por la CONAFOR (más el apoyo con asistencia técnica)	341.83 pesos por hectárea pagados por el Fondo Monarca (que incluyen los 12 dólares por hectárea de estos terrenos)

A partir del 2009 todos los propietarios que tienen terrenos en las Zonas Núcleo y que estén dentro del Fondo Monarca recibirán durante los próximos 18 años el dinero de acuerdo al número de hectáreas que tienen en las Zonas Núcleo y aún más para las hectáreas que conserven con bosque bien cuidado. Con la firma del convenio de adhesión a los fondos concurrentes la CONAFOR duplica los pagos a los propietarios hasta 2026.

Además la CONAFOR aumentará el pago a 382.00 pesos por hectárea a partir del año 2019 en bosques que presenten una cobertura forestal mayor al 50%. Adicionalmente a estos recursos, la CONAFOR apoya con recursos para la contratación de un asesor que brinde acompañamiento técnico a los propietarios y que les permita llevar a cabo las actividades de conservación y restauración en las Zonas Núcleo de la Reserva

¿Entonces todas las comunidades y ejidos que participan en el Fondo Monarca y firman el convenio de los Fondos Concurrentes, empezarán este año a recibir los recursos conforme a esta nueva forma?

Así mero.

Vamos a tener más dinero para conservar y vigilar el bosque y para equiparnos para trabajar.

Y para mejorar nuestra comunidad.

**¿Cómo hacerle para poder beneficiarse de este nuevo esquema?**

Sólo los propietarios de predios en las Zonas Núcleo de la Reserva que participan en el Fondo Monarca pueden solicitar el apoyo de los Fondos Concurrentes. Los propietarios interesados deberán firmar el convenio de adhesión a los Fondos Concurrentes y entregar los documentos que demuestren que son los legales propietarios y, en el caso de ejidos y comunidades indígenas, que cuentan con la autorización de su asamblea.

Para mayores informes favor de contactar a:  
**Biólogo Eligio García Serrano**  
 Coordinador del Fondo Monarca  
 Héroes Ferrocarrieros  
 Zitácuaro, Michoacán, C.P. 61506  
 Tel. (715) 1192063

Figure 9. Poster designed to communicate the new phase of the Monarch Fund with ejidos, indigenous communities and private properties.

## 2.5. Recognition of the Monarch Fund.

In 2015, the BBVA Foundation awarded the prize for its performance in the Conservation of Biodiversity in Latin America to the Mexican Fund for the Conservation of Nature A.C., for fifteen years of work in the preservation of the Monarch Butterfly and the establishment of the Monarch Fund. This award is recognition of this successful public-private model of biodiversity conservation, which includes the participation of the government of Mexico, the state governments of Michoacán and Mexico, civil society and forest landowners. Their coordinated work has resulted in a reduction in deforestation at the Monarch Butterfly's wintering sites.

## 3. REFERENCES

- CONAFOR. 2010. *Hacia una estrategia integrada de manejo de cuencas: microcuencas del Sistema Cutzamala*. Segundo coloquio internacional "Cuencas Sustentables" hacia la COP16. CONAFOR-SEMARNAT. 39 p.
- CONAFOR. 2013. *Fondo Monarca: Un instrumento innovador de pago por servicios ambientales en apoyo a la conservación de bosques y a la retribución a las comunidades forestales*. Gerencia de Servicios Ambientales-CONAFOR, Fondo Mexicano para la Conservación de la Naturaleza y Fondo Monarca. México. 63 p.
- CONAGUA. 2005. *The Cutzamala System. Conagua-Semarnat*. CONAGUA. México. 49 p.
- CONANP. 2001. *Programa de manejo de la Reserva Especial de la Biósfera Mariposa Monarca*. Comisión Nacional de Áreas Naturales Protegidas (CONANP)-SEMARNAT. México. 138 p.
- Daily, G.C. 1997. *Nature's services. Societal dependence on natural ecosystems*. Island Press, Nueva York, E.U.A., 392 p.
- Ferraro, P., y A. Kiss. 2002. *Direct payments to conserve biodiversity*. *Science* 298(5599): 1718-1719.
- Fondo Monarca. 2016. *Ficha técnica del Fondo para la Conservación de la Mariposa Monarca*. Fondo Monarca. México. 6 p.
- Frausto, Juan. 2010. *Financiamiento para la Conservación de los Bosques y la Biodiversidad en la Reserva de la Biósfera Mariposa Monarca: el Fondo Monarca en fondos ambientales y pagos por servicios ambientales: proyecto de capacitación de RedLAC para fondos ambientales*. Rio de Janeiro: RedLAC, 2010. 102 p.
- Graf, S., y P. Bauche. 2010. *El pago por servicios ambientales como instrumento de conservación de cuencas*. Comisión Nacional Forestal. México. 8 p.
- Honey-Roses, J. K. Baylis M.I. y Ramírez. 2011. *A Spatially Explicit Estimate of Avoided Forest Loss*. *Conservation Biology* 25(5): pp. 1032-1043.
- Wunder, S. 2006. *Pagos por servicios ambientales: Principios básicos esenciales*. Centro de Investigación Forestal (CIFOR). Occasional Paper 42: 24.
- WWF. 2016. *Degradación forestal en la zona núcleo de la reserva de la biosfera mariposa monarca 2015-2016*. Informe presentado en el Comité Técnico del Fideicomiso del Fondo Monarca. 3p.