

**REPORT ON THE MISSION TO THE MONARCH BUTTERFLY BIOSPHERE
RESERVE (MEXICO) FROM 10-14 JANUARY, 2011**



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ABBREVIATIONS

CONANP	National Commission for the Protection of Natural Areas (Comisión Nacional de Áreas Naturales Protegidas)
CONAFOR	National Forestry Commission (Comisión Nacional Forestal)
FONATUR	National Fund for Tourism Development
FMCN	Mexican Fund for Nature Conservation (Fondo Mexicano para la Conservación de la Naturaleza)
PROARBOL	<i>Federal tree restoration programme</i>
PROFEPA	Federal Law Office for Environmental Protection (Procuraduría Federal de Protección al Ambiente)
INEGI	Instituto Nacional de Estadística y Geografía
IUCN	International Union for the Conservation of Nature
MBBR	Monarch Butterfly Biosphere Reserve
MF	Monarch Fund
PES	Payment for Environmental Services
PET	Temporary Employment Programme (Programe para el Empleo Temporal)
PROCOCODES	Programme of Conservation for Sustainable Development (Programa de Conservación para el Desarrollo Sostenible)
Semarnat	Ministry of the Environment and Natural Resources (Secretaría de Medio Ambiente y Recursos Naturales)
SP	State Party
SECTUR	<i>Tourism Secretariat</i>
WWF	World Wildlife Fund

EXECUTIVE SUMMARY AND LIST OF RECOMMENDATIONS

The World Heritage Committee (Decision 34 Com 7B.35) requested a joint World Heritage Centre/IUCN reactive monitoring mission to evaluate the state of conservation of the property with a particular focus on the situation concerning illegal logging in the property. The mission was also to report on ongoing work with local communities on environmental protection and developing alternative livelihoods to logging, and development of a nature-based tourism plan including an effective benefit-sharing mechanism for local communities to provide an incentive for their support for the conservation of the property.

The mission took place the second week of January 2011, a period when the butterflies are installed in their hibernating colonies but prior to the time that they become more active in February, preparing for their migration north. Visiting the Monarch Butterfly Biosphere Reserve (MBBR) for two days, the mission met five local communities and numerous federal, state and non-governmental organisations undertaking projects within the property which contribute to the North American Monarch Conservation Plan, a trilateral effort that meets

annually to develop a joint programme for the conservation of the Monarch Butterfly. A 10-year management plan for the MBBR, developed in 2001, is currently being revised and expected to be completed by the end of 2011. The mission also visited three visitor facilities developed to manage tourism during the butterfly season from late November to February, a training centre to help local communities lead more sustainable lives, a community nursery producing seedlings for reforestation, and one butterfly colony at the Cerro Pelón Sanctuary.

In terms of integrity, the property continues to house more than half of the overwintering colonies of the Monarch Butterfly's eastern population, the population that exhibits the longest insect migration in the world. Illegal logging has been massively reduced, although significant deforestation in the reserve continued due to an unprecedented storm in February 2010 causing floods and landslides resulting in forest loss, as well as from one forest fire. While all logging is banned in the core area of the property, sustainable logging is allowed in the buffer zone and a number of sawmills were observed in the region. This means that control of legal and illegal timber production will always be a challenge, although the State Party, through many agencies, has developed a number of controls including community vigilance committees and strategic checkpoints to monitor logs coming out of the reserve.

A number of major infrastructure projects to improve the visitor experience and reduce their impact on the butterfly colonies have been built and others are planned. These visitor centres, funded by the government and the Monarch Butterfly Fund (created by Federal, State and private funds) are given to the local communities to manage and reap the benefit from tourist visitation. There are 16 historical sites for butterfly colonies of which 11 occur in the reserve (but not all are populated each year). In addition each year these colonies can move up to 1.5 km, making the development of visitor facilities and viewing trails a challenge. Diversification of the nature-based tourism to extend beyond butterfly viewing, which only lasts for 4 months of the year, is needed. Also the MBBR is made up of over 100 different landowners (of which over 70% is communally managed), yet only a minority receive direct revenue from butterfly tourism. No benefit-sharing mechanism that helps all the communities within the reserve is in place. In addition the entrance fee to view such an outstanding phenomenon, particularly from the perspective of international visitors, is very low.

Complete butterfly monitoring data (Rendón-Salinas *et al.*, 2011) is available for the past 17 years which indicates that the numbers of hibernating butterflies as well as number of different colonies fluctuate greatly, although there is a general tendency towards a decline. This may be due to factors both in Mexico and further north where they migrate and breed, and is a cause for major concern.

However given the large fluctuations in population from year to year making it difficult to determine long-term trends, and given that a reasonable number have been censused in the reserve during the 2010-2011 season (especially compared to the 2009-2010 season which was the worst season ever recorded), it is not possible at this point in time to forecast the future conservation status of this site. Nonetheless what is certain is that the government and other parties concerned with the management of the site need to continue and not let up on their excellent conservation efforts. A number of activities, with priority ratings and time lines have been produced in the North American Monarch Conservation Plan (2008). This report endorses this excellent plan and suggests that reporting

by the State Party in future outlines progress made on these activities. Specific recommendations from the mission include:

1. As a priority, it is recommended that the State Party develop a clear and transparent benefit-sharing mechanism in which it is clear how all communities located within both the core and buffer areas of the reserve are compensated for their efforts to conserve the site, and that any tourism revenue is shared more equitably. This would improve the current situation where only the “lucky few” with butterflies on their property receive tourism benefits as well as infrastructure from the government, and should aim that all communities related to the property benefit from tourist-generated revenue. One option would be that a proportion of all tourist revenue gained could go into a common pool for communities with no butterflies on their land.
2. The excellent and very important efforts in place to control illegal logging as well as fire prevention and other types of habitat conversion should be maintained.
3. The important efforts to develop sustainable tourism and improve the visitor understanding and commitment to the MBBR need to be continued and strengthened. In particular, appropriate signage on hiking trails, maintenance of trails, and signage at the hibernation viewing points to explain the World Heritage status of the area and the Outstanding Universal Value of the migration phenomenon is needed. Non-butterfly related tourism opportunities also need to be developed.
4. The development of more sustainable lifestyles and alternative livelihoods for the local communities is essential, and here the work by government agencies as well as Alternare, WWF and other NGOs is to be commended and continued.
5. The programme of Payment for Ecosystem Services needs to be continued and developed on a rational, long-term basis. The amalgamation of the Monarch Fund with other agencies which pay for ecosystem services is a positive step to streamline procedures and ensure equity within the local communities concerned.
6. The current monitoring of the butterfly populations is good although this should be extended to monitor the impact that plant and insect parasites are having on the forests in the property, and the availability of water for the butterflies.
7. Alternatives to allow people more access to the forest during the non-butterfly season are being investigated for integration into the next 10 year management plan, although this needs to be very carefully monitored and flexible mechanisms set up in case increased access may have adverse effects on forest regeneration.
8. Improved coordination of the efforts being made by the large number of actors in the area which include government agencies, civil society organizations, local communities, private foundations/donors is needed. The “Forum Monarca” is an important mechanism in bringing together all the relevant players.

9. Given the widely fluctuating wintering phenomenon of the butterflies in the MBBR, it is recommended that another monitoring mission take place in the next five years to report on the continuing trends in annual wintering populations, forest cover within the reserve, and progress taken on developing tourism and an equitable benefit-sharing plan for the local communities.

1 BACKGROUND TO THE MISSION

1.1 Inscription history

The Monarch Butterfly Biosphere Reserve (MBBR) was inscribed in 2008 (Decision 32COM 8B.17) under criteria vii, related to its superlative natural phenomenon of millions of Monarch Butterflies that fly thousands of km each year to over-winter in a tiny area in a specific type of conifer forest in Central Mexico.

The area in which most butterflies roost had previously been inscribed as a Biosphere Reserve in 2006, comprising a serial property covering a total area of 56,259 ha, which includes three core areas covering 13,552 ha in total, surrounded by two buffer zones covering 42,707 ha, located at an altitude between 2,040 and 3,640 m.

1.2 World Heritage values

The World Heritage value of this site is the phenomenon of the mass migration of Monarch butterflies, which arrive to the site around the beginning of November and then move around to sometimes settle on exactly the same stand of trees as their predecessors did in previous winters, although in other years they may return to the same general area and elevation but up to 1.5 km away. Some 16 historical roosting areas on 12 different massifs have been reported, of which 11 areas occur in the MBBR. However not all of these are “occupied” each year (Slayback *et al.*, 2007; Rendón-Salinas *et al.*, 2011).

Essential to the survival of the butterflies is dense and healthy forest, the loss and fragmentation of which has been viewed as the principle threat to this over-wintering phenomenon. Basically the butterflies need a quiet area of Oyamel fir *Abies religiosa* forest with a specific temperature and access to water at about 2,900-3,300 m in altitude, on moderately steep southwest-facing slopes, where they then congregate in massive clumps covering a very small area.

The average area occupied (which includes colonies both within and outside the MBBR) has been around 7.5 ha, although this has ranged from 2 to 18 ha during the past 17 years (Rendón-Salinas *et al.*, 2011). At the beginning of February when temperatures rise and days become longer the butterflies start to fly and mate, and move about 1 km from the Oyamel forest into a lower forest dominated by *Pinus pseudostrobus* (Calvert and Brower, 1986). Intact forest as well as a source of water for the butterflies to drink is essential for their survival. The butterflies then leave by March to start their northward journey. This phenomenon applies to the Eastern population of Monarch Butterflies. There is also a Western population (occurring west of the Rocky Mountains) which winters on the coast of California, and other non-migratory populations.

1.3. Integrity issues raised at the time of nomination and inscription

When the property was nominated in 2007 the main issue raised was the rapid increase in human population within and around the reserve, identified as the main driver for development pressures listed, in order of importance, as forest fires, deforestation (both illegal and also poorly managed legal logging and wood collection), forest pests including bark beetles and parasitic mistletoe, agricultural encroachment, urban encroachment, and tourism pressures associated with growth in visitor numbers and heavy concentration in specific areas. Environmental pressures included climate change and the use of GMOs in monarch breeding grounds.

Of all these pressures, the IUCN evaluation singled out illegal logging as the then biggest proximate threat to the reserve, a view supported by Honey-Rosés (2009). This threat was severe enough to merit recommending deferral of the nomination, although the property was inscribed with a strong recommendation that efforts to control illegal logging be undertaken by the State Party, and that this be monitored. The evaluation also stressed the lack of alternative livelihoods to logging for the local population; irregular tourism infrastructure catering to both a domestic and international tourist demand that was developed by local communities with no previous tourism experience; and a lack of a benefit-sharing mechanism to ensure that all local communities were compensated for their efforts to protect the resource.

1.4 State of Conservation report and justification of the mission

After inscription in 2008, Mexico produced two reports in February 2009 and in March 2010. These provide information on investments in ecotourism and community development projects, compensation to local landowners paid by the Monarch Fund (including programmes such as Payment for Environmental Services (PES) and programmes of conservation for sustainable development (PROCOCODES) and temporary employment (PET)), efforts to combat illegal logging, and information on reforestation activities. However while they demonstrate a wide variety of projects and funds aimed at helping the local communities, the State of Conservation report by IUCN presented in Brasilia (WHC-10/34.COM/7B) requested a detailed plan for the sustainable use of the property including an effective benefit-sharing mechanism for local communities as an incentive to enhance their support for its conservation. Mexico responded to the decision of the WHC by providing up to date information on the efforts to control illegal logging, current projects to enhance alternative livelihoods, compensation payment schemes as well as information on the damage incurred during the exceptional storm of February 2010, but the development of an equitable benefit-sharing plan was still missing. The decision in Brasilia recommended that the joint monitoring mission requested in 32 Com 8B.17 take place in the second half of 2010 (see terms of reference to this mission, itinerary and composition of the mission team in Annexes 1-3).

2 NATIONAL POLICY FOR THE PRESERVATION AND MANAGEMENT OF THE WORLD HERITAGE PROPERTY

2.1 Protected area legislation

It is important to note that the Monarch Butterfly hibernating colonies were only “discovered” in 1975 (Urquhart, 1976), although they were known to local people long before. The Government then made a decree in 1980 to protect the monarch overwintering areas, although extractive activities were only restricted during the butterfly season (CEC, 2008). In 1986 the Government then declared five protected areas covering 16,110 ha, although with little local consultation (Honey-Rosès, 2009). As most forest lands in Mexico are managed under common property arrangements called “*Ejidots*” or Indigenous Communities (in this report both groups will be referred to as communities), the sudden loss of access to their land caused much conflict, and by 2000 the Government, following intense consultative processes, negotiation and the development of a the Monarch Butterfly Fund which provides compensation to the communities living inside the core area of the reserve, created the current boundaries of the Biosphere Reserve by Presidential Decree. At the same time a 10 year management plan was developed in 2001. This includes no logging permitted inside the core area, although managed logging is permitted within the buffer zone. Some protected area legislation also covers a few smaller colonies located outside of the MBBR.

2.2 Institutional framework and management structure

CONANP, the National Commission for the Protection of Natural Areas, which is a division under the Ministry of the Environment and Natural Resources (Semarnat), is the lead coordinating agency for the MBBR and employs a Director, Sub-director and about 7 other professional staff for the MBBR. Over a hundred federal and state forest police and agents guard the reserve. As the reserve occurs in two states (Michoacán and México), both state environmental agencies are involved as well as a number of other federal and state agencies, the principal ones being the National Forestry Commission (CONAFOR), the Federal Law Office for Environmental Protection (PROFEPA), the Federal Tree Restoration Programme (PROARBOL), the Tourism Secretariat (SECTUR) and a number of NGOs including Alternare and WWF. There is a Monarch network aimed at coordinating all these diverse agencies and organisations to maximise cooperation and synergies.

The Mexican Fund for Nature Conservation (FMCN) is also an important donor for the reserve, as is the Monarch Fund (MF), created in 1980, and the National Fund for Tourism Development (FONATUR).

There is a need for better coordination of the efforts being made by a large number of actors in the area, covering government agencies, civil society organizations, local communities, private foundations/donors, etc. We were informed that there existed a “Forum Monarca” in the past precisely for this purpose, which did not function during 2009-2010, but which will be revived during 2011.

2.3 Other international treaties

The MBBR, as its name indicates, is also a Biosphere Reserve inscribed under UNESCO’s Man and the Biosphere Programme in 2006 with the same boundaries as the World Heritage property.

3 IDENTIFICATION AND ASSESSMENT OF ISSUES / THREATS

3.1 Nature and extent of threats to the property

The threats outlined when the property was nominated in 2007 have not changed, although serious efforts have been taken to address them. As noted before, these include a rapidly increasing human population within and around the reserve which is the main driver of deforestation (both illegal and legal, including firewood collection), fires, and agricultural and urban encroachment. Other threats which appear to be increasing are pests attacking the trees (bark beetles *Dendroctonus* spp. and other insects; parasitic mistletoe *Arceuthobium* and *Psittacanthus* spp., and disease), which are mainly managed by removing the affected trees (and thereby providing wood to the local community). Tourism pressure and extreme weather events possibly caused by climate change are also threats to the property.

When we asked the Reserve Director his opinion of the greatest management challenge to the property he immediately said the people. Surprised by this remark, the mission quickly understood that this is because the local communities expect the government to follow up on promises of alternative livelihoods and payments for environmental services, and if these are not forthcoming then illegal activities could again increase.

The reserve includes 15 municipalities in the State of Michoacán and 12 municipalities in the State of México, and the total population in all the municipalities surrounding the reserve numbers over 780,000 (INEGI, 2005). The area is economically very poor with little job opportunities; many men work in Mexico City or in the USA, leaving their families behind. Although there are slightly conflicting data, it seems that most of the protected area lies on land owned either by 59 “*ejidos*” (rural communities, covering 20,603 ha), 13 indigenous communities (4,792 ha), or 22 small properties that are either private (932 ha) or federal land (707 ha) and “other land” (427 ha., note there have been some territorial disputes between some *ejidos* concerning federal land). The SP report in 2010 referred to 39 landowners established in the core areas, and Carranza Sanchez *et al.* 2010 recorded 58 landowners within the reserve boundaries, with the largest town within the reserve, Mineral de Angangueo, numbering 5,030 inhabitants.

The management issues due to the vastly complex system of having more than 100 “owners”, the reserve spanning two states and a huge number of federal and state bodies, not counting the NGOs active in the area’s management, have presented and still present management challenges as well as opportunities.

3.2 Management effectiveness

The principle threat identified, that of illegal logging, has been seriously addressed by the State Party through a number of Federal agencies including CONANP, PROFEPA, CONAFOR, and the States of Mexico and Michoacán, as well as NGOs such as WWF. All parties concur that illegal logging has been significantly reduced in the past year, with only 1.56 ha affected during the 2009-2010 season.

The SP reported on the construction of two logging control booths, one in Santa Maria y sus Barrios in Mexico and the other in Crescencio Morales

in Michoacán, as well as local vigilance committees, which have helped in controlling illegal logging.

3.3 Developments in the conservation of the property since the last report to the World Heritage Committee

One negative development reported by the SP in November 2010 was the result of an unprecedented storm in February 2010 with catastrophic rainfall (including snow and hail). This exceptional precipitation during four days in the dry season (equivalent to the total amount of rainfall during the entire rainy season) caused damage by floods and landslides to 120 ha of land within the MBBR, of which 74 ha were forested (Carranza Sanchez *et al.*, 2010). These areas were determined by comparing satellite images of 2008 and 2010. Both areas which had been previously damaged by logging and fire as well as intact forest were affected. The mission visited two landslides in the buffer zone of La Mesa, and was informed that these were medium-sized landslides and that some 119 landslips had occurred. The challenge now is to raise resources to restore these areas. The communities in the areas concerned have been allowed to remove the fallen trees to commercialise them, and some timber has been used to build small dams in an effort to slow erosion.

Fortunately no butterfly colonies were directly affected by these landslides, although some were very close. However there may have been an indirect impact as the main vegetation type affected was Oyamel forests in ravines, which is where the butterflies roost. It was also observed that the “La Mesa” colony, a colony that is regularly occupied and where there were important landslides, moved and has not returned for the past two seasons. However this is not the first time that the butterflies have been affected by bad weather, as there had been very high mortality during a freak snow storm in 2002 (Brower *et al.*, 2004). However the amount of precipitation during those four days in February 2010 was unprecedented.

A more positive development was the inauguration in November 2010 of a new visitor facility at the Serra Chincua Sanctuary on land belonging to the Cerro Prieto *ejido*, municipality of Angangueo. FONATUR invested US\$2.5 million in a new visitor centre which includes a new parking lot, audio-visual theatre, stalls for 18 shops and 18 restaurants, toilets, horse stables and a nursery, all designed to reduce the service area and restore the natural surroundings. Three *ejidos* benefit from this facility, with one *ejido* charging US\$ 2.50 to use the road to get to the centre (US\$ 4.20 for buses) and another *ejido* charging US\$ 3.00/person to visit the butterfly colony. Forty people work in this centre with a stable of 72 horses, and it was noted that direct and indirect benefits of the centre go to 1,400 people.

4 ASSESSMENT OF THE STATE OF CONSERVATION OF THE PROPERTY

4.1 Changes in forest cover

Recalling that the total core area of the MBBR covers only 13,552 ha and that dense, intact forest is essential for the hibernating butterflies, areas under forest cover have been monitored by the WWF and the MBBR since 2001 (Rendón-Salinas *et al.*, 2010). They have reported a fairly positive trend in decreasing deforestation during the last decade (see table 1).

Table 1: Areas deforested inside the MBBR (Rendón-Salinas *et al.*, 2010)

Season	Areas deforested (ha.)
2001-2003	70.65
2003-2005	239.69
2005-2006	461.05
2006-2007	243.79
2007-2008	259.72
2008-2009	53.71
2009-2010	117.09 (1.56 due to illegal woodcutting)

In the 2009-2010 season 117.09 ha of forest disappeared, although only 1.56 due to illegal woodcutting. The rest of the loss was due to extreme weather events and a fire, showing the vulnerability of the reserve. This forest loss over one year amounted to almost 0.9% of the entire core area, which while less than the high of 3.4% recorded in 2005-2006, is still cause for concern. However, if this unprecedented storm is a one-off event (although it may become a more frequent event due to climate change), what can be said is that illegal woodcutting has been reduced. While this is doubtlessly due to the vigilance by authorities and local communities in reducing illegal woodcutting, at the same time during 2009-2010 there was also a great increase in “legal” wood available to the communities (all the trees that were blown over during the storm were allowed to be commercialised by the local communities) so data on years where there are no storms hence available timber supplies is required to ensure that these illegal logging measures are sustained.

While it is recognised that the degradation and loss of forest is mainly due to illegal logging, historically it should be noted that when the reserve was decreed in 2000, some 23% (12,933 ha) of the reserve had already been transformed by different human activities. By 2008 it was estimated that 13,622 ha had been transformed, although reforestation programmes are underway and logging has been reduced due to Payment for Ecosystem Services (López-García, 2007)

Due to security concerns which restricted the mission’s field visit, we did not have the opportunity to observe any evidence of recent deforestation, and can only rely on the very detailed reports produced by the WWF and the MBBR.

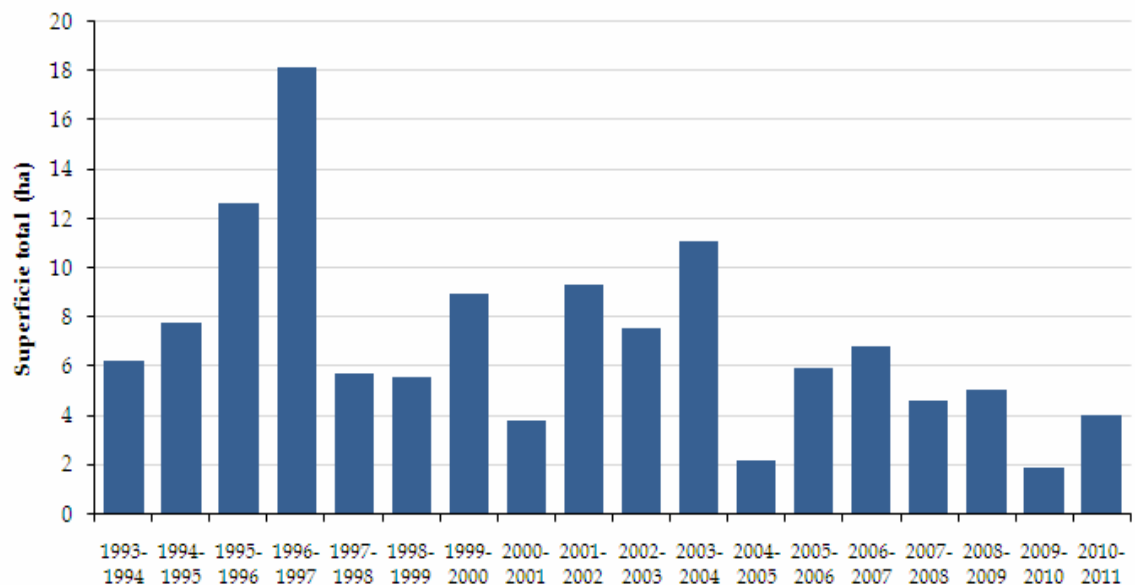
The SP report of 2010 provided some data on forest pests, mainly Bark Beetles, that were attacking the Oyamel fir trees, and phytosanitary measures have been undertaken involving the removal of infected trees in the buffer zone. Further information on the extent of forest pests and their effect on the remaining forest stands is required.

4.2 Changes in numbers of butterflies

Of great concern are the population trends of the hibernating population. Since the early 1990s, the WWF and MBBR have monitored the areas and locations occupied by monarchs throughout the wintering season, with the assistance of local residents (García-Serrano *et al.*, 2004; Rendón-Salinas *et al.*, 2007). Beginning in 2004, these monitoring activities have included biweekly measurements from November to March (Galindo-Leal and Rendón-Salinas, 2005; Rendón-Salinas *et al.*, 2006).

Data collected from 1994-2010 (Rendón-Salinas *et al.*, 2010) shows an average area of 7.44 ha used by the butterflies each year although there are large fluctuations, making the determination of any long-term trend difficult. However it is clear that the 2009-2010 butterfly season at 1.92 ha was the worst ever, and the 2010-2011 season at 4.02 ha the fourth worst and below the mean. However this could be due either to a reduction in winter habitat, or a decrease in butterfly numbers due to factors in their breeding areas. Note that this data is for all the butterfly colonies, with some 75% of the 2010-2011 colonies (3.09ha) occurring within the reserve.

Figure 1. Butterfly occupation from 1993-2010 (from Rendón-Salinas *et al.*, 2011)



Rendón-Salinas *et al.* (2011) note that out of the 11 known colonies inside the reserve, between four and seven have been occupied since 2004. During the most recent season only four colonies occurred, just like the previous year. These four colonies occurred in four different sanctuaries (Cerro Pelón, Chivatí-Huacal, Sierra Campanario and Sierra Chincua) belonging to four different communities (E. Nicolás Romero, C.I. Carpinteros, E. El Rosario and E. El Calabozo Fracción I respectively). However these colonies accounted for 75% of the butterfly population.

In the 2009-2010 season four colonies also occurred within the reserve, although the colony of Sierra Chincua was located in the E. Cerro Prieto community rather than the E. El Calabozo Fracción I community, and while Cerro Pelón (belonging to the E. Nicolás Romero community) had no colony last season, the sanctuary at Cerro Pelón belonging to E. El Capulín community did (but had no colony in the 2010-2011 season).

While it is slightly confusing that sometimes the butterfly colonies are referred to as the sanctuary in which they are found, and at other times to the community which owns the land, what is important to note is that while there are 11 lucky communities that have butterfly colonies on their property, the butterflies do not return every year. It is also important to

note that there are smaller butterfly colonies that occur outside of the reserve which also receive visitors. During this season five other colonies occurred in areas outside of the reserve.

4.3 Tourist infrastructure development

Perhaps the most important issue for butterfly conservation is the development of adequate alternative livelihoods for local people, who are no longer allowed to use the forest, and a reasonable sharing of benefits from tourism to all the local communities (currently it is only the local communities that have butterflies on their property that benefit). All the parties concerned are well aware of the needs to develop jobs and more sustainable livelihoods for the people living within and around the reserve.

For example the mission visited the visitor facility at “La Mesa” where butterflies apparently had arrived in early November, but then moved to the larger colony at nearby Rosario, located in the same massif. Although “La Mesa” had butterflies fairly regularly in the past, this is the third consecutive year that there have been no colonies. This is unfortunate as two years ago a special visitor facility was constructed to take advantage of butterfly tourism and provide income to the community. While no link has been made between the construction of this visitor centre and the disappearance of La Mesa colony (note the butterfly colonies do move naturally from site to site), at the same time the loss of the butterfly colony has severely affected the planned use of the visitor facility. The mission was informed that this new and very attractive facility had had only 20 visitors all season as there were no butterflies, although there were plans to bring school groups to use the facility during non-butterfly periods. This illustrates the difficulty of developing tourism infrastructure aimed at the butterflies for a resource that is mobile and unpredictable.

A proposal to promote mountain-biking in the reserve during the non-butterfly season was discussed as a way to increase tourist revenue for the local communities. While this activity may bring in some additional money, this is unlikely to be high as mountain-bikers tend to be young people with less disposable income. Also mountain-biking and nature tourism (hiking, observation of wildlife) are often incompatible. If the mountain bike routes use the same trails that are used to visit the butterfly colonies, increased erosion and further forest degradation will lead to a decline in OUV of the property. Any mountain-biking within the reserve needs to be kept well away from the fragile mountain trails leading to the butterfly colonies, and ideally be confined to existing dirt roads.

There is a clear need to further improve the tourism and interpretation aspects of management. This includes the need for appropriate signage on hiking trails, maintenance of trails, and signage at the hibernation viewing points to explain the World Heritage status of the area and the Outstanding Universal Value of the migration phenomenon.

It must be stressed that all tourism planning must put the needs of the butterflies first, as it has been noted that high numbers of tourists and degradation of the overwintering environment due to poorly-regulated visits is a threat that may be harming the butterflies.

5 CONCLUSIONS AND RECOMMENDATIONS

The big question is whether the overwintering population of Monarch Butterflies for which the property was inscribed, and the forest which supports this phenomenon, is being maintained. There is no doubt that the migratory phenomenon of the Monarch Butterfly is at risk, and a few catastrophic years could destroy it altogether. However the mission recognises the major effort being undertaken by a large number of parties to ensure that forest loss is not only reduced, but that in the years to come forest cover should improve (noting that conifers take 70 years to mature, hence reforestation is slow and any further deforestation must be halted). Continued monitoring of the situation is required and the excellent ongoing conservation efforts need to be continued and strengthened.

In order to effectively maintain local community commitment to conserve the resource it is essential that an effective benefit-sharing mechanism be developed, so that all members of the communities living within the MBBR receive an incentive to protect the butterflies and their habitat. During our limited encounters with them, the local communities demonstrated a commitment to conserve the butterflies, provided that their standard of living would improve. Currently only a few communities benefit from butterfly tourism, and a mechanism to ensure that everybody benefits is essential. Revenue from well-managed butterfly tourism could also be increased.

However, butterfly tourism, given its short (four month) period as well as irregular nature in terms of numbers of butterflies that return and where, means that other environmental and cultural tourism needs to be developed. The mission considers that there is great potential for other forms of sustainable tourism in the area.

If alternative livelihoods to communities previously reliant on subsistence agriculture, logging (and in the past mining) are not developed, it will be no surprise if members of the communities lose patience and either stop protecting their land from external logging or else engage in illegal logging themselves.

The North American Monarch Conservation Plan has prioritised a number of activities with timelines which seem very sensible, and have been the result of many consultative processes. While these are too numerous to include in this report, the priority recommendations determined by this mission are as follows:

1. As a priority, it is recommended that the State Party develop a clear and transparent benefit-sharing mechanism in which it is clear how all communities located within both the core and buffer areas of the reserve are compensated for their efforts to conserve the site, and that any tourism revenue is shared more equitably. This would improve the current situation where only the “lucky few” with butterflies on their property receive tourism benefits as well as infrastructure from the government, and should aim that all communities related to the property benefit from tourist-generated revenue. One option would be that a proportion of all tourist revenue gained could go into a common pool for communities with no butterflies on their land.

2. The excellent and very important efforts in place to control illegal logging as well as fire prevention and other types of habitat conversion should be maintained.
3. The important efforts to develop sustainable tourism and improve the visitor understanding and commitment to the MBBR need to be continued and strengthened. In particular, appropriate signage on hiking trails, maintenance of trails, and signage at the hibernation viewing points to explain the World Heritage status of the area and the Outstanding Universal Value of the migration phenomenon is needed. Non-butterfly related tourism opportunities also need to be developed.
4. The development of more sustainable lifestyles and alternative livelihoods for the local communities is essential, and here the work by government agencies as well as Alternare, WWF and other NGOs is to be commended and continued.
5. The programme of Payment for Ecosystem Services needs to be continued and developed on a rational, long-term basis. The amalgamation of the Monarch Fund with other agencies which pay for ecosystem services is a positive step to streamline procedures and ensure equity within the local communities concerned.
6. The current monitoring of the butterfly populations is good although this should be extended to monitor the impact that plant and insect parasites are having on the forests in the property, and the availability of water for the butterflies.
7. Alternatives to allow people more access to the forest during the non-butterfly season are being investigated for integration into the next 10 year management plan, although this needs to be very carefully monitored and flexible mechanisms set up in case increased access may have adverse effects on forest regeneration.
8. Improved coordination of the efforts being made by the large number of actors in the area which include government agencies, civil society organizations, local communities, private foundations/donors is needed. The "Forum Monarca" is an important mechanism in bringing together all the relevant players.

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7 ANNEXES

Terms of Reference

Reactive Monitoring Mission Monarch Butterfly Biosphere Reserve World Heritage property, Mexico

10-14 January 2011

The Monarch Butterfly Biosphere World Heritage property was inscribed on the List of World Heritage by the World Heritage Committee at its 32nd session in 2008 (Decision **32COM 8B.17**). At the time of inscription the Committee made the following comment concerning the requirements for the protection and management of the property, stating:

“The principal focus of protection and management should be to prevent illegal logging in the property. Priorities to achieve this include concerted planning and action between all relevant federal, state and local agencies, and work with local communities on environmental protection and the provision of alternative livelihoods to logging. As the overwintering phenomenon is a significant attractor to visitors, management also needs to be directed to achieving sustainable public use of the property. This should respect the quality of the visitor experience and promote benefit-sharing mechanisms for local communities as an incentive to enhance their support to the conservation of the property. Continued investment in coordinated continent-wide management of the migratory phenomenon is a further important dimension of site management. Achieving all of these priorities requires the provision of adequate and sustained institutional and financial support.”

The Committee followed by requesting a report from the State Party by 1 February 2009 which would provide information about *“existing programs being implemented in the property, reflecting the resources invested in management and conservation activities with emphasis on actions aiming to halt illegal logging.”* The Committee asked that *“particular attention be given to:*

- a) continuing and strengthening the work with local communities on environmental protection and alternative livelihoods to logging;*
- b) exploring options for a major new investment in development and implementation of a coordinated plan to halt illegal logging involving all federal, state and local agencies;*
- c) developing and implementing, in the context of the 2007 Agreement of Collaboration between the Tourism Secretariat (SECTUR) and the National Commission for Natural Protected Areas (CONANP) on the Development of Nature-based Tourism, a detailed plan for sustainable public use of the nominated property and an effective benefit-sharing mechanism for local communities as an incentive to enhance their support on the conservation of the property.”*

Decision **32COM 8B.17** also requested the State Party of Mexico to invite a joint UNESCO/IUCN monitoring mission to assess the state of conservation of the property and report to the World Heritage Committee.

The objective of the monitoring mission is to undertake an assessment of the State of Conservation of the Monarch Butterfly Biosphere Reserve World Heritage property, as requested by the World Heritage Committee. The mission will assess the factors affecting the Outstanding Universal Value (OUV) of the property and in particular review the reported threats to the integrity of the property as well as its current status of management and protection. The mission team will be composed of Kishore Rao, Deputy Director of the World Heritage Centre and Wendy Strahm representing IUCN.

In particular, the mission should assess the following key issues:

- a) Assess the protection status of the property, and in particular the levels and specific areas of illegal logging, encroachment, and forest fires within the property, and review the effectiveness of the management responses to these threats;
- b) Review any other threats to the Outstanding Universal Value of the property, including invasive species, and the management responses to these threats;
- c) Review the specific steps taken to enhance the engagement of the local communities and landowners in the management and protection of the property, including through benefit-sharing mechanisms and the development of alternative livelihoods;
- d) Assess the impacts of tourism services and tourism infrastructure development on the property, and the effectiveness of benefit-sharing arrangements in tourism-related activities and other local community development efforts;
- e) Review the status and effectiveness of the North American Monarch Conservation Plan (NAMCP), and in particular the implementation of the recommended joint monitoring protocols; and
- f) Assess the Management Programme currently in place and contribute to the review of this Programme, which will be instated by the end of 2011 and aims to ensure to the long-term preservation of the Monarch Butterfly over-wintering sites.

The mission team should conduct the necessary field visits to the property to make these assessments, and in particular visit the areas affected by the factors mentioned above. The mission team should further hold consultations with the Mexican authorities at federal, regional and local levels, in particular with the management authority, as well as with all relevant stakeholders. These include representatives of local communities, land owners, logging concession lease-holders, and local and national NGOs.

Based on the results of the above mentioned assessment and discussion with the State Party representatives, the mission team will develop recommendations to the Government of Mexico for approval by the World Heritage Committee to conserve the OUV of the property and improve its conservation and management.

The mission team will provide a concise mission report (IUCN to lead) in English on the findings and recommendations of this Monitoring Mission following the standard format, no later than 6 weeks after completion of the mission.

Annex 2

Itinerary and programme

Sunday, 9 January, 2011

Arrival Rao/Strahm to Mexico City.

Monday, 10 January, 2011

- 8:30 Meeting Rao/Strahm.
- 12:00 Welcome meeting with State Party and key agencies.
- 14:00 Lunch offered by the National Commissioner Luis Fueyo Macdonald.
- 15:00 Meet police guard of 30 in five vehicles including one armoured van and drive to hotel at Valle Bravo. Accompanied in jeep by Javier Medina and Lourdes Juárez of CONANP, Matilde García from the Ministry of Foreign Affairs, and Ricardo Guerrero, Institutional Affairs Officer from the UNESCO Mexico Office. Arrive after dark to hotel in Valle Bravo in Mexico State.
- 20:00 Dinner with field mission participants and Rosendo Antonio Caro (Director of reserve since 1.5 years) and Felipe Martínez (Sub-director of reserve since about a year).

Tuesday, 11 January, 2011

- 8:00 Depart in convoy for the NGO Alternare which has a training centre for members of local communities to lead more sustainable lifestyles.
- 12:00- Meeting at Alternare with numerous short presentations by all major
- 14:00 players engaged in projects of butterfly/forest conservation in the MBBR.
- 15:00 Sierra Chincua. Visit a new visitors centre recently built by the government through FONATUR and inaugurated by the President in November 2010. Taste Mexican cuisine with tortillas made of blue maize (now a part of intangible World Heritage). No time to see the butterflies as apparently it takes 1.5 hours to reach the site, so instead speak to community leaders over lunch.
- 16:30 Ejido 1, Cerro Prieto. Meet community living in core area which has had wind damage and received exceptional permission to exploit the wind-damaged trees. They tell us how difficult it is living in the core area of the reserve as they do not have enough land to do agriculture and are not allowed to cut down trees.
- 17:00 Visit area next to visitor centre which is forest on government land, but for several years the land ownership was disputed between the government and the local community which had encroached on the land, so during this time no management of the trees (which are being attacked by Bark Beetles) was able to be undertaken. However now that the dispute is resolved, the government can take measures to remove the beetle-infested trees in order to "clean up" the forest.
- 17:30 Ejido 2, Los Remedios. Meet another community who tell the same story as Cerro Prieto. They want to conserve nature but need more help.
- 18:00 Ejido 3, Santa Ana. Meet third community where they live. Say they have commitment to protecting the forest but that there is no work here, families

split apart as they have to go to Mexico City or USA to work. Natural disaster gave them 1700m³ wood, c. 460 people in Ejido. Note that it is important to conserve forest to conserve water for the nation and they feel that the government should pay them for protecting ecosystem services

19:00 Return to hotel at Valle de Bravo.

Wednesday, 12 January, 2011

6:00 Leave hotel Valle Bravo to drive to landslip at La Mesa
8:30 Visit first landslip at La Mesa, discussion with local community.
9:15 Visit second landslip at El Mercado, discussion with local community.
9:40 Visit new visitor facility at La Mesa which includes cabins for tourists, only problem in that the butterflies have not hibernated in this area for the past three seasons. See illegal sawmill that has been confiscated.
12:00 Nursery at San Juan Xocunoso, visit WWF and Probosque nursery project "Vivero Las Novias del Sol" and discussion with local community.
14:00- Visitor site at Macheros (C.I. Nicolas Romero). Lunch and then ride
18:00 horses/walk to visit a butterfly site c. 4 km uphill from Macheros.
18:20 Leave Macheros, return to Mexico City at 21:30.

Thursday, 13 January, 2011

Meeting between mission evaluators, and visit Xochimilcho and University of Mexico, both cultural WH sites.

18:00 Final wrap-up meeting at CONANP.

Friday, 14 January, 2011

Departure from Mexico City.

Annex 3

Composition of mission and list and contact details of people met

The mission was composed of Kishore Rao (Deputy Director, World Heritage Centre, k.rao@unesco.org) and Wendy Strahm (IUCN World Heritage Programme consultant, wendy.strahm@gmail.com).

During the field visit the mission was accompanied by:

Person	Position	Agency	Contact details
Biol. Javier Medina González	Asesor del Comisionado	CONANP	Central office jmedina@conanp.gob.mx
M.C.Lourdes Juárez Marusich	Directora Cooperación Internacional	CONANP	Central office lourdes.juarez@conanp.gob.mx
Matilde García Verástegui	Deputy Director General, for the General Assembly and Int'l orgs., UN	Ministry of Foreign Affairs	mgarciav@sre.gob.mx
Ricardo Guerrero Morales	Institutional Affairs Officer	UNESCO Mexico Office	r.guerrero@unesco.org
Ing. Rosendo Antonio Caro Gómez	Director	Monarch Butterfly Biosphere Reserve	rosendo.caro@conanp.gob.mx
Biol. Felipe Martínez Meza	Subdirector	Monarch Butterfly Biosphere Reserve	fmartinez@conanp.gob.mx

The initial meeting in Mexico City was presided by the National Commissioner and included (in addition to those that accompanied the mission on the field visit):

Person	Position	Agency	Contact details
Luis Fuego MacDonald	National Commissioner	CONANP	comisionado@conanp.gob.mx
David Gutiérrez Carbonell	Director General, Regional Operations	CONANP	daguti@conanp.gob.mx
Cesar Guerrero Azellano	Multilateral Relationships		
Javier Solsa	Director	PROFERPA	
Francisco Vidareas	Anthropologist	World Heritage	
Diana Correa Belmonte	Social Services		
Sarah Alejandra García Martínez	Assistant	CONANP	

A meeting with the major players concerned with the conservation of the Monarch Butterfly Biosphere Reserve took place at the NGO “Alternare”, present (in addition to the people accompanying the mission) were:

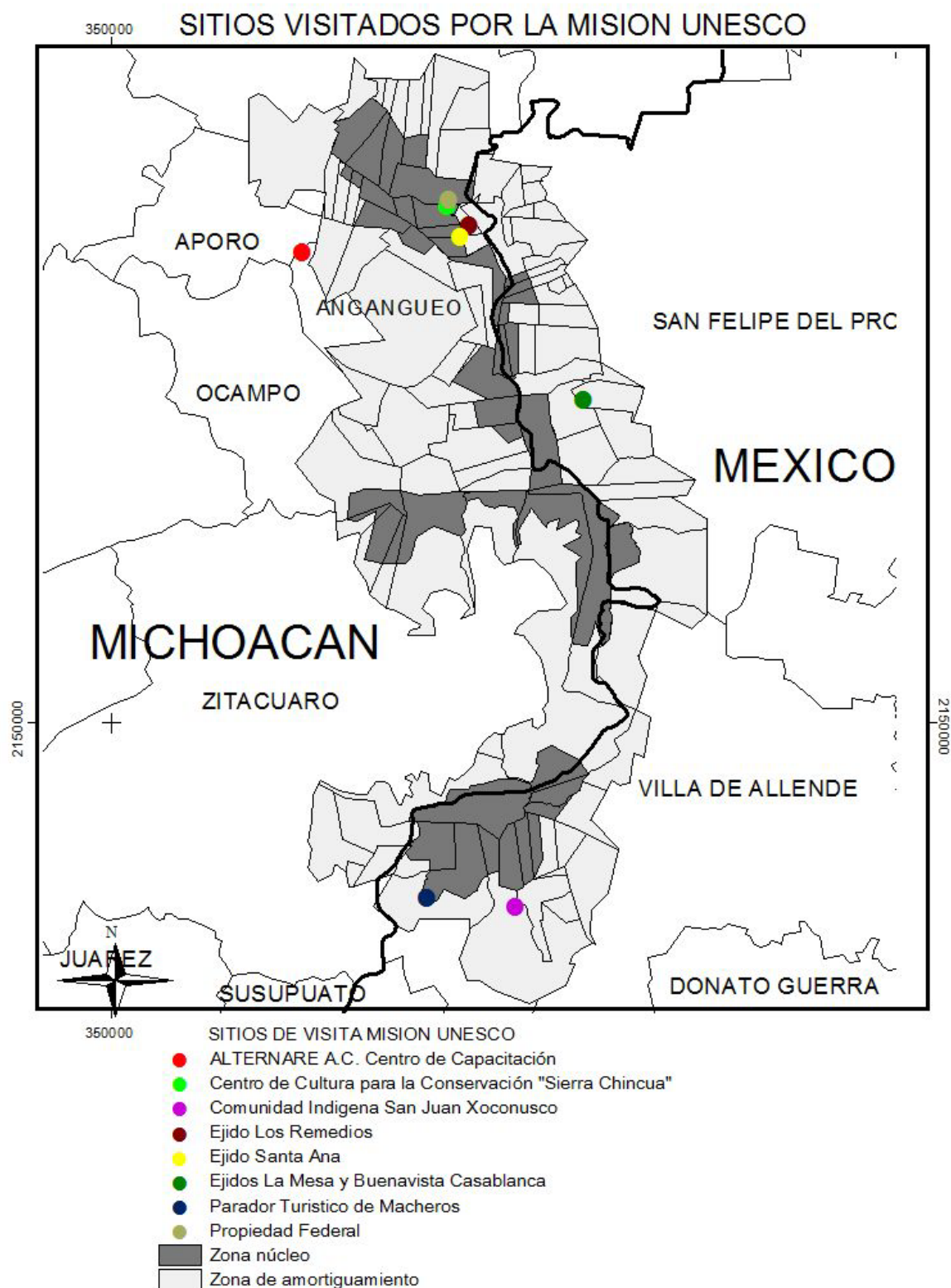
Person	Position	Agency	Contact details
Biol. Guadalupe del Río Pesado	Directora	ALTERNARE	alterna5@prodigy.net.mx
Ana María Muñiz Salcedo	Centro de Capacitación	ALTERNARE	Alternare_ana@yahoo.com.mx
Eligio García Serrano	Coordinator	Monarch Fund	fondomonarca2000@yahoo.com.mx
Javier Alpizar Manjarrez	Coordinador de inspectores	PROFERPA	jalpizar@profepa.gob.mx
Salvador Moreno García	Gerente Regional IV Balsas	CONAFOR	smoreno@conafor.gob.mx
Eduard Rendón Salinas	Coordinator, Monarch Butterfly Programme	WWF-Mexico	erendon@wwfmex.org
Alejandro Méndez López	Director	COFOM	dirección.general@cofom.michoacan.gob.mx
Arturo Beltran Retiz	Director of restoration and development	PROBOSQUE	abretiz@gmail.com
Eneida Montesinos Patiño	Coordinador	Red de Áreas Naturales Protegidas Hermanas para el Monitoreo de la Mariposa Monarca en México	eneidamp@hotmail.com
Ysmael Venegas Pérez	Subdirector	Monarch Butterfly Biosphere Reserve	yvenegas@conanp.gob.mx

We were shown the work of FONATUR at the new Cerro Pelón visitor centre by Ing. Carlos Humberto Montoya E., Subgerente de Servicios, chmontoya@fonatura.gob.mx, where we met the commissioners and other representatives of the local community (see table below). The nursery run by the Indigenous Community of San Juan Xoconusco is called “Vivero Las Novias del Sol”.

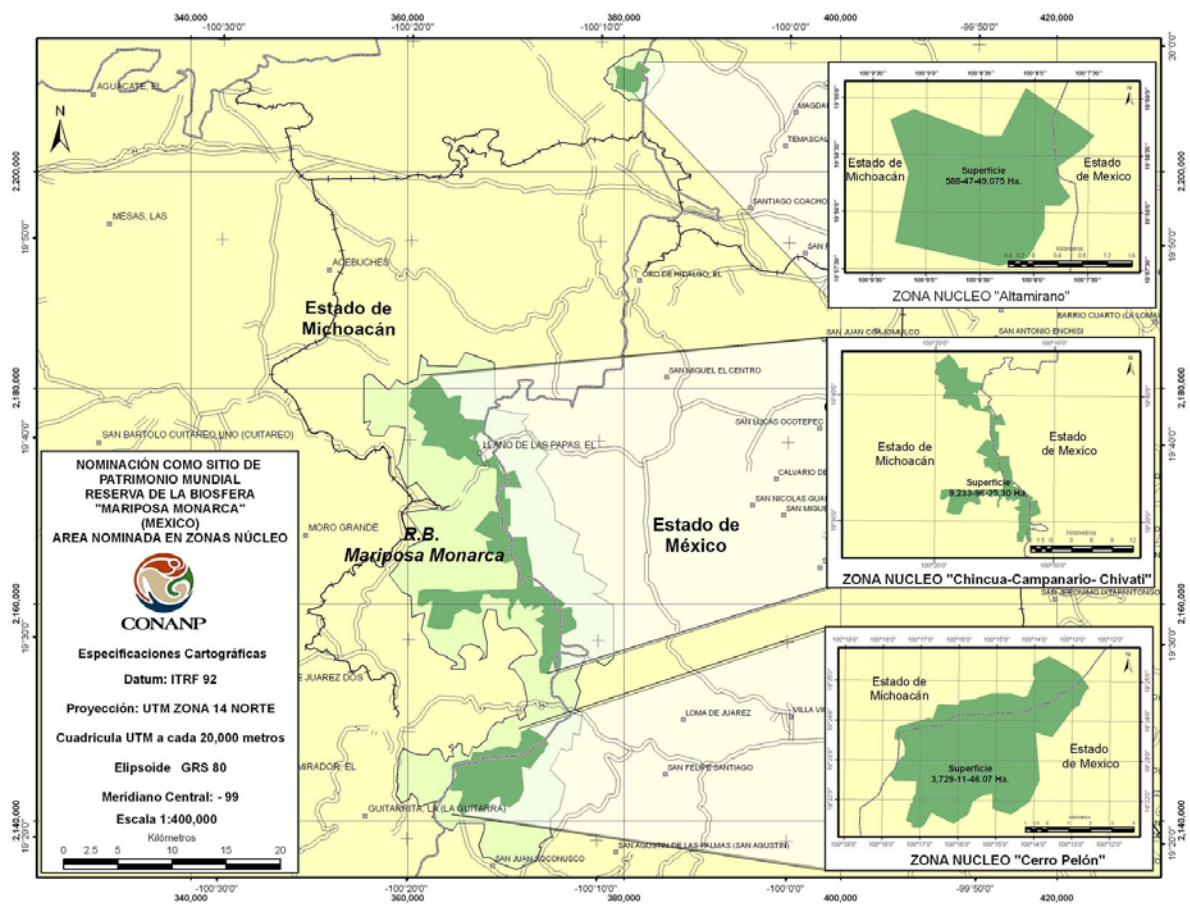
Commissioner	Ejido/Community	Municipality	State
Javier Martínez Colín	Cerro Prieto	Ocampo	Michoacán
Francisco Díaz Cruz	Los Remedios	Ocampo	Michoacán
Juan Colín Colín	Santa Ana	Ocampo	Michoacán
Pedro Luis Solís	La Mesa	San José del Rincón	México
Felix Solís Martínez	CI San Juan Xoconusco	Donato Guerra	México
Faustino Estrada Vera	El Capulín	El Capulín	México

At the Butterfly Sanctuary of “Macheros” at El Capulín we also met two architects working with the Ministry of Tourism. Captain Platas of the Mexican Federal Police was responsible for the security measures that included up to 130 police and 17 vehicles that accompanied us during the field visit.

Annex 4. Map of areas of the Monarch Biosphere Reserve visited during the mission, provided by the State Party.



Map of the Monarch Biosphere Reserve (from nomination).



Annex 5.

Selected photos from the Monarch Butterfly Biosphere Reserve



Landslip after exceptional rain of February 2010. La Mesa. 12 January 2011.



Fallen tree after exceptional rain of February 2010. La Mesa. 12 January 2011.



Landslip after exceptional rain of February 2010. El Mercado/La Mesa. 12 January 2011.



Patch of burnt forest, seen from La Mesa. . 12 January 2011.



La Mesa visitor facility. 12 January, 2011.



Sign, La Mesa visitor facility. 12 January, 2011.



New visitor centre inaugurated November 2010 at Sierra Cincua, and example of signs to right. 11 January 2011.



Tourist stall (left) and conference room (above) Sierra Cincua Visitor Centre.



Disputed land (left) and forest attacked by Bark Beetles (right) Sierra Cincua. 11 January 2011.



House Ejido Santa Ana, 12 January 2011.



“Intangible” World Heritage: Mexican tortillas made of blue maize and hot sauce, at Sierra Cincua, 11 January 2011.



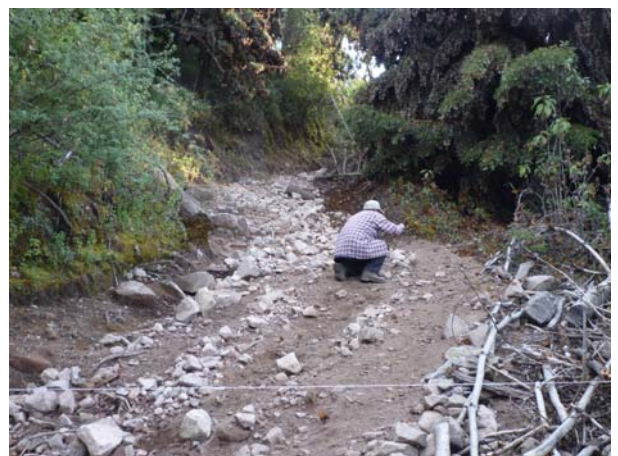
Legal logs at La Mesa, 11 January 2011



Entrance to the Macheros butterfly sanctuary, 12 January 2011.



Walking up to the butterfly site, Macheros 12 January 2011.



Tourist photographing butterflies, ignoring the white string, the supposed limit. Macheros. 12 January 2011.



**Butterfly on a policeman's glove, Macheros.
12 January 2011.**



**View of Macheros Sanctuary. All butterfly
photos taken from this site. 12 January, 2011.**



**Our faithful federal police guard at
Macheros, 12 January, 2011.**

All photos © Wendy Strahm