Fig. 1. Map of the Americas showing 12 geographical areas. The areas represent the 12 data sets used to calculate the plant-data summary. For each area, the total number of species of vascular plants and the number of species restricted to that area (in parentheses) are shown.

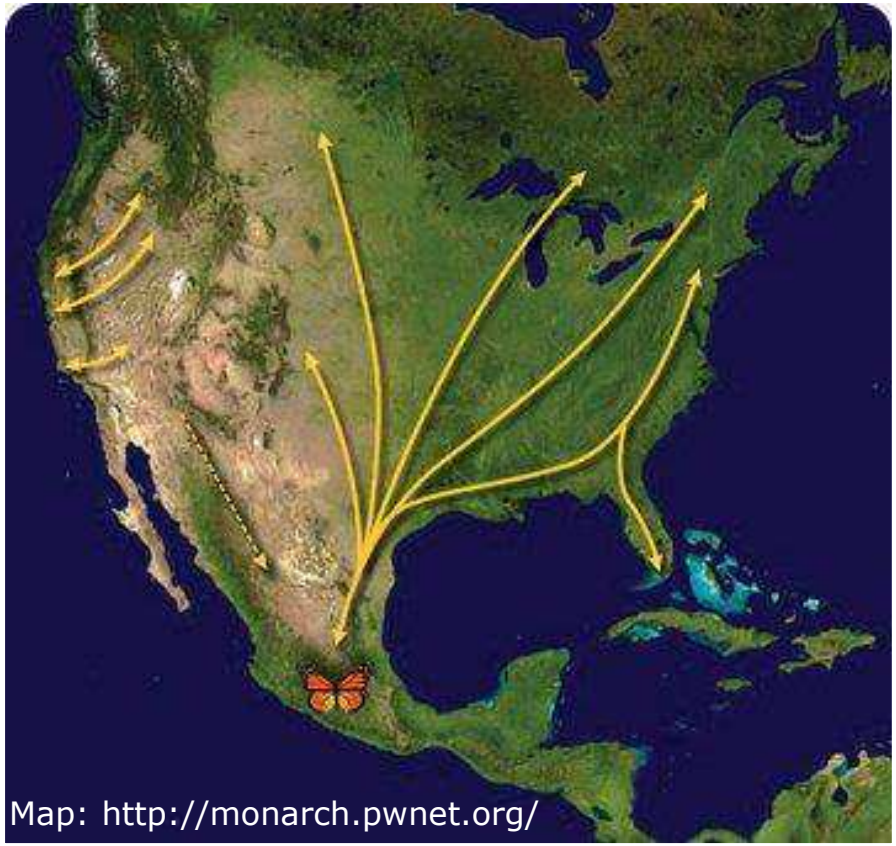
Ulloa et al. 2018, Science

Downloaded from http://science.sciencemag.org/ on January 1, 2018

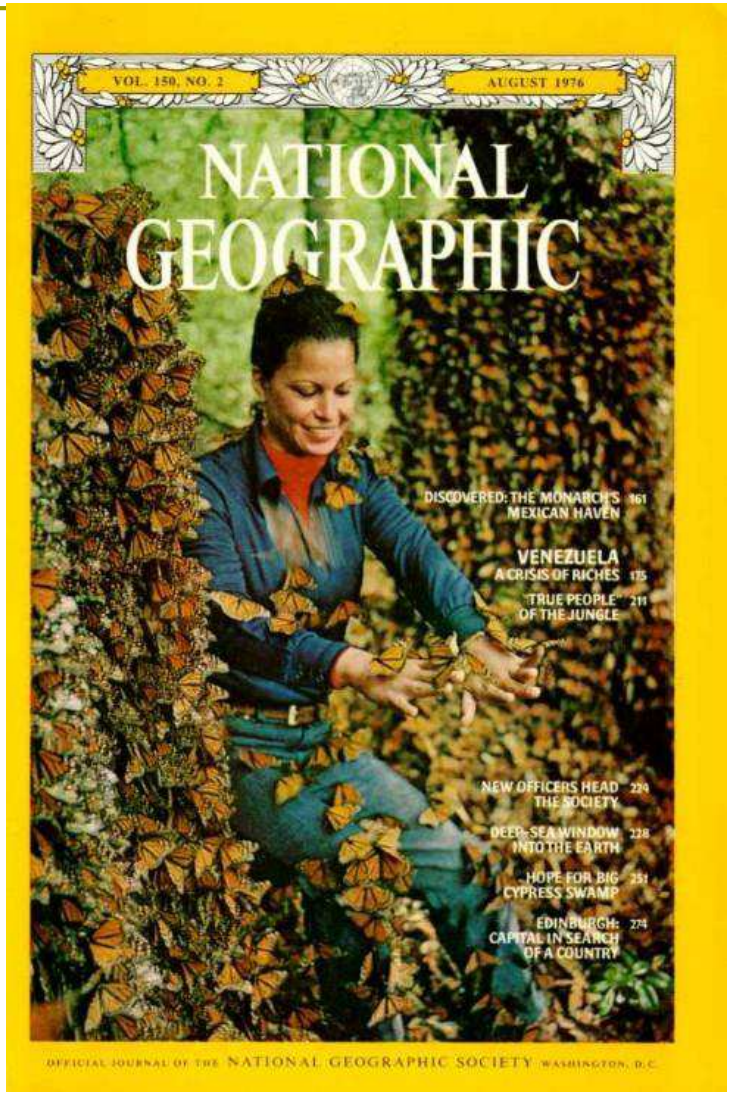
Pines and oaks in Mexico

- ~ 60 species of pines (world total 105 – 125 spp)
- < 150 especies de encinos (world total ~ 600 spp)
- Highest diversity for both genera

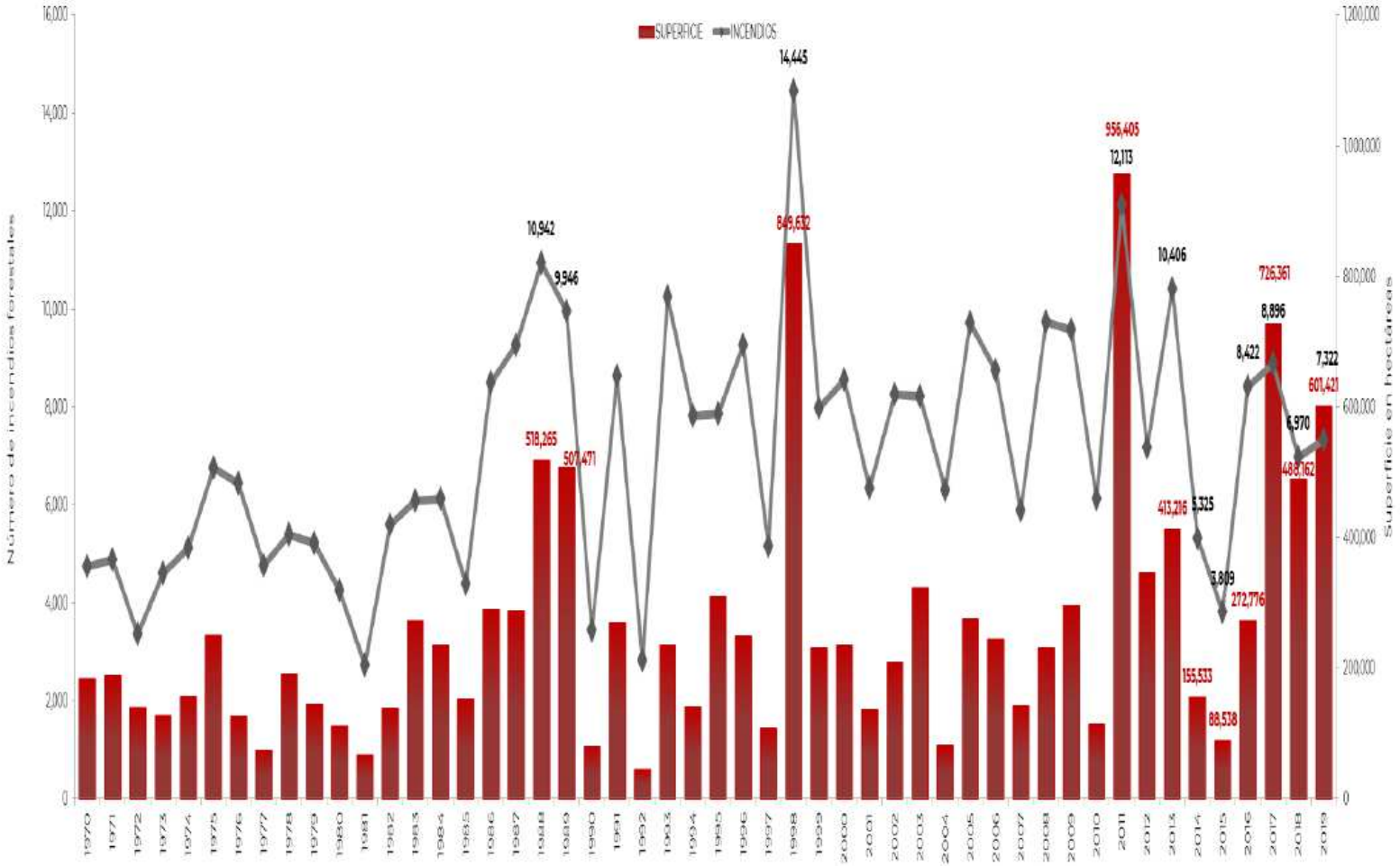
Found at Last:
The Monarch's Winter Home
(Fred Urquhart and Norah Urquhart, 1976).



Map: http://monarch.pwnet.org/



Number and Area of Fires in Mexico 1970 – 2019*



Source: https://www.gob.mx/conafor/documentos/Reporte_del_01_de_enero_al_24_de_octubre_de_2019.pdf, *2018 data only until october 24

Indigenous and traditional communities knowledge about integrated fire management

Fire Management in the Monarch Butterfly Biosphere Reserve

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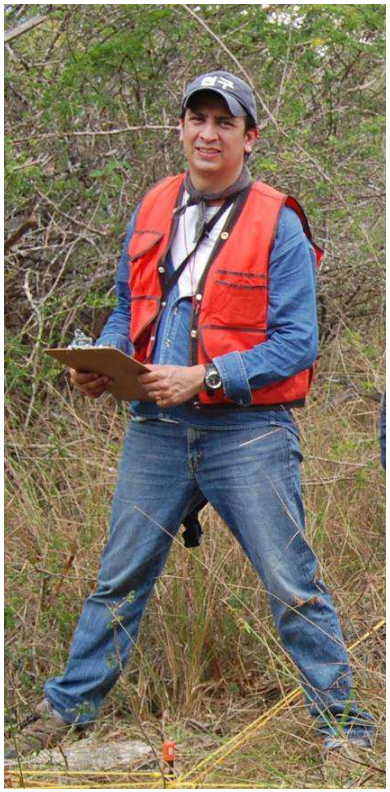
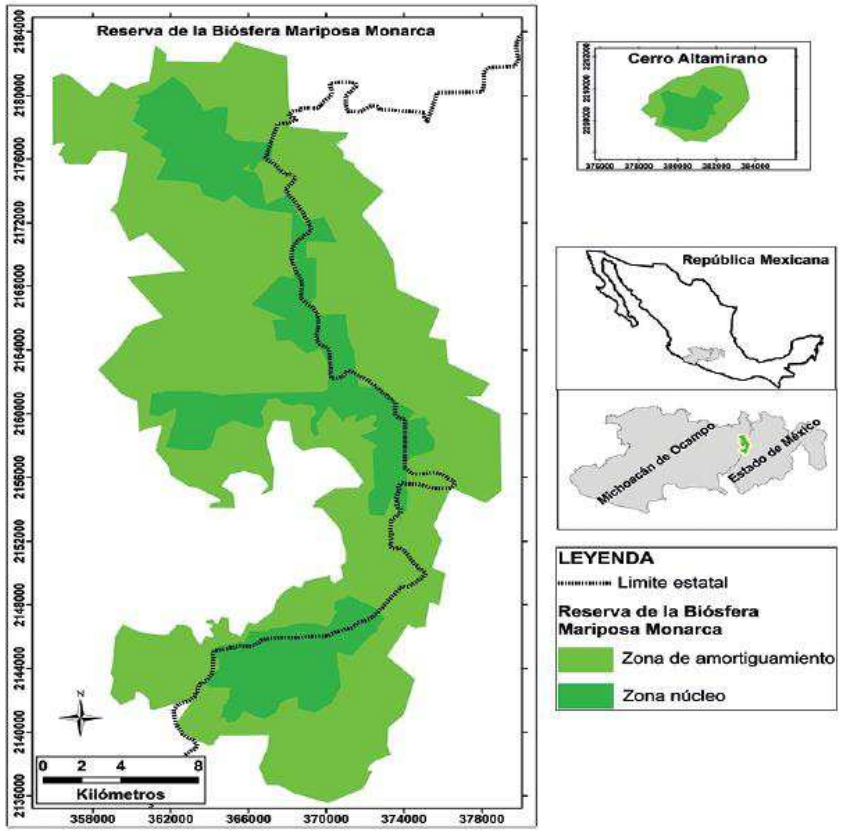
UNAM

CIGA
CENTRO DE INVESTIGACIONES
EN GEOGRAFÍA AMBIENTAL

H. Leonardo Martínez Torres

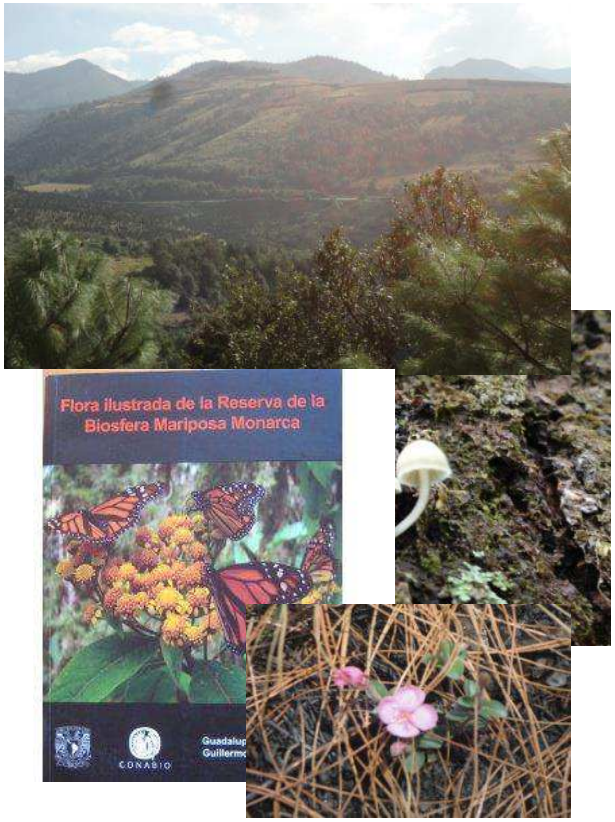


The Biosphere Reserve



- 56,259 ha
- Divided into three core areas (13,551 ha) where productive activities are not allowed, and two buffer areas (42,708 ha)
- 600 ha belong to the Federal Government of Mexico

Monarch Butterfly Biosphere Reserve



- Emblematic Biosphere in Mexico
- Representative Reserve of Mountain Ecosystems in Central Neovolcanic axis
- Provides key environmental services (Carbon sequestration and water regulation)
- Encloses large biodiversity
  - 4 major vegetation types
  - 700 + species of vascular plants
  - Presence of several endemic taxa

…also…

- Home to at least 27,346 inhabitants, in 63 settlements legally established
- Productive activities by these inhabitants have been traditionally seen as jeopardizing the ecological integrity of the MBBR
- Inhabitants might have both passively and actively modified the fire regimes in these forests

Kown historical events of the region

- Taximiroa, Zitácuaro, San Felipe de los Alzati: Prehispanic locations in the region
- Area given as Encomienda to Gonzalo de Salazar in 1550 by Viceroy de Mendoza
- Evidence of a catastrophic fires dated in 1670, and then another in 1883 (Garduño 2013)
- Mine established in 1792

Diversidad Cultural

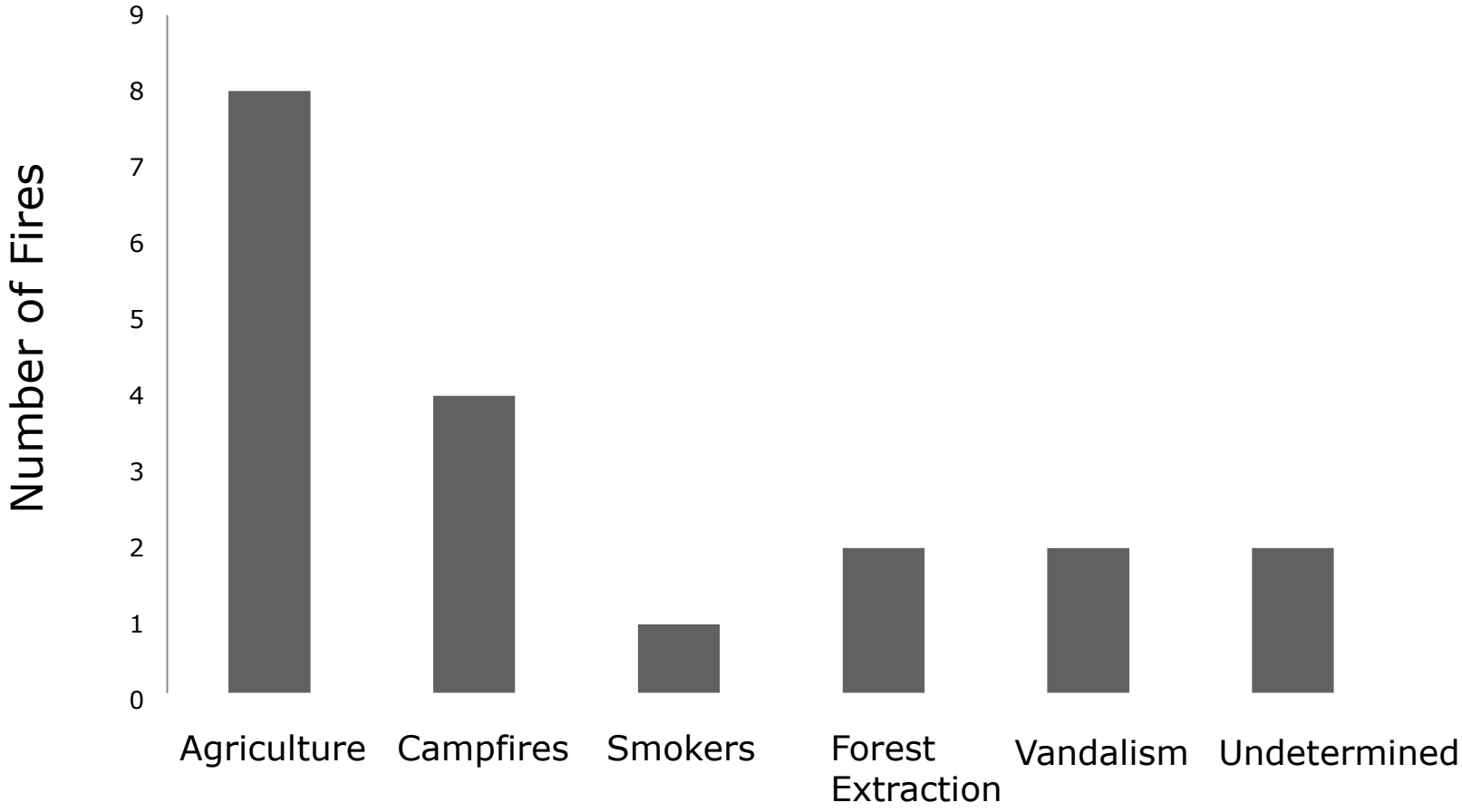
- Vavilov center
- 13% of Mexicans consider themselves as part of indigenous community (from latin: “indu” = in, “geno” = to reproduce)
- 15 % of national territory is in the hands of indigenous communities (and 80% of territory in hands of ejidos and indigenous communities)
- Total of 287 indigenous languages

Fuente: CONABIO

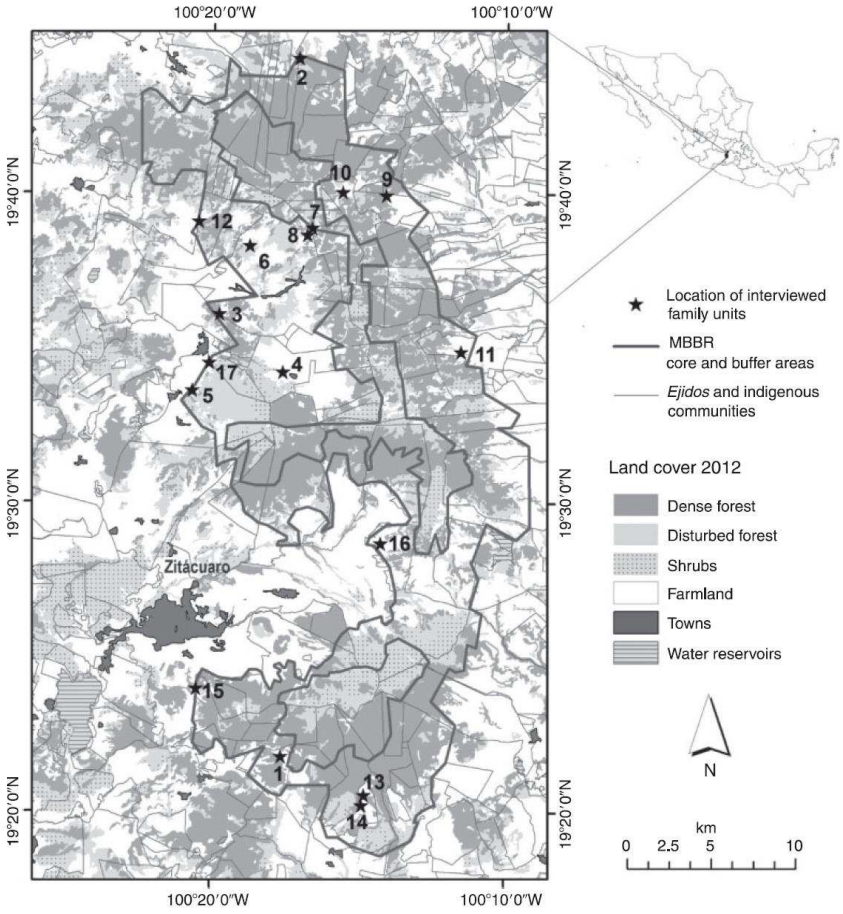
Research questions

- Under the premise that fire management strategies that mimic natural fire regimes will have a lower impact upon ecosystem integrity:
  - How are do local inhabitants and authorities manage fire, and how far is this management from natural fire regimes?
  - How is Integrated Fire Management conceived and practiced by Key Local Actors ?

Sources of Ignition (2012 visited fires)
Institutional Response and Local Fire Management



Local Interviews



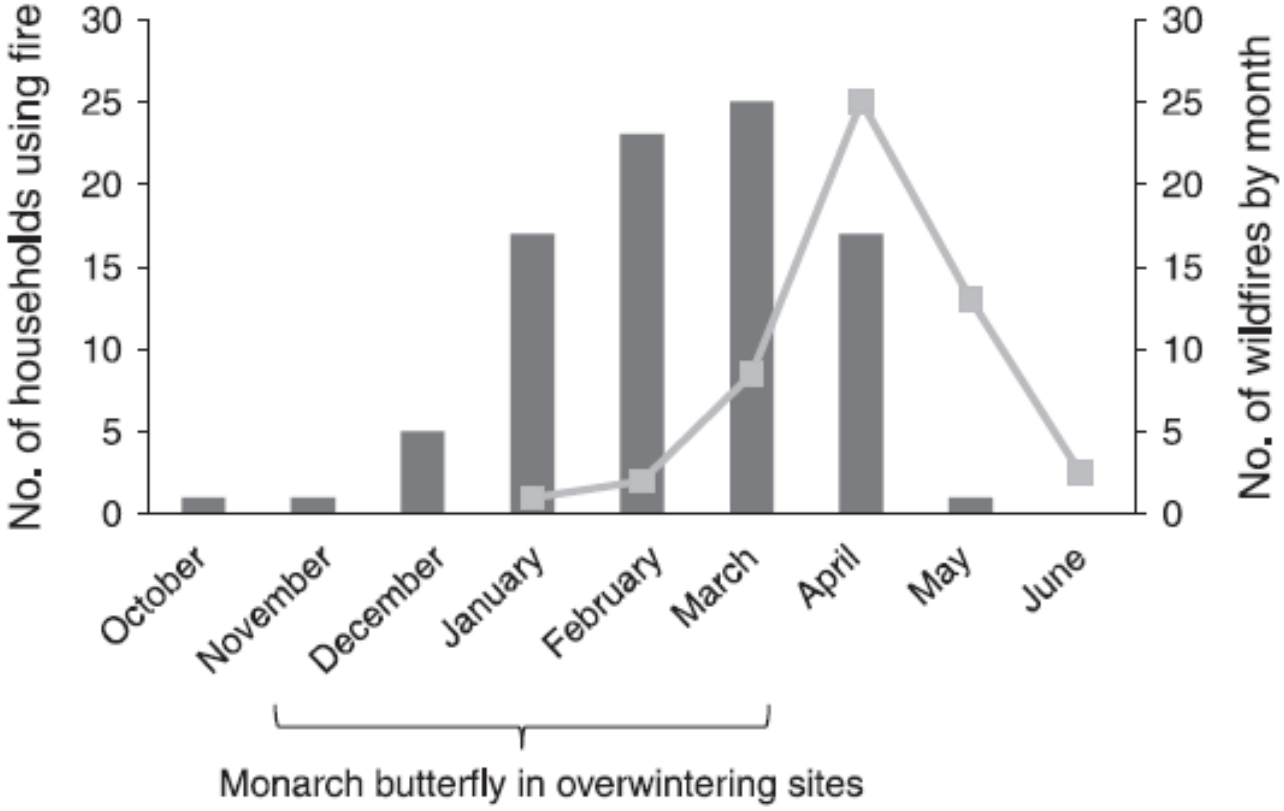
- 17 localities: 2 indigenous communities, and 15 mestizo ejidos
- Visited 44 family units, with different number of informants

Different Uses of Fire (Martínez-Torres et al. 2016 IJWF)

Major points

- 4 Major uses of fire with 9 types of fires being conducted: agriculture (3), animal husbandry (1), forest management (3), and road and canal maintainance (2)
- The most conspicuous fire use is for agriculture, which consists of mound burning
- Traditional use of fire is transmited within families
- Losing this knowledge could be detrimental to fire management in the long term

Use of fire by households vs. No. Of wildfires in the MBBR



Management = Fighting & Supression

Photo Credit: Leonardo Martínez Torres

Who are the key local actors and how they perceive fire management?

Suppression Fire
Firefigthing
Fire outside forest
Discouragement of
Traditional fire use

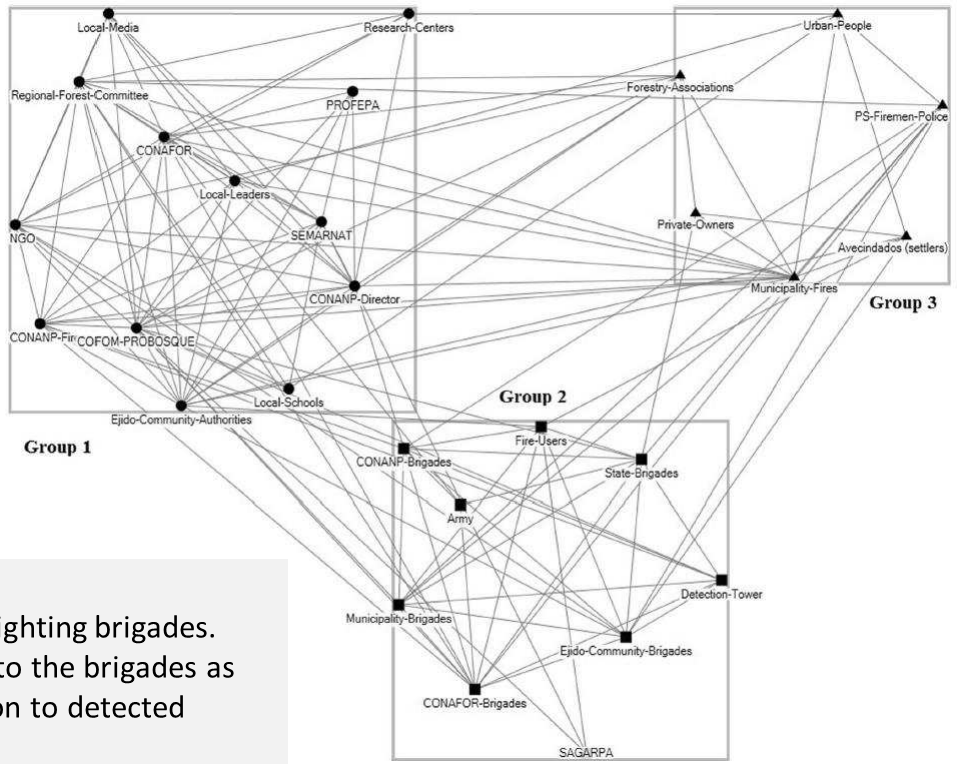
Fire Management
Fire culture
Multidisciplinary
Adaptative
Participatory

How integrate the vision, knowledge, interests and responsibilities of forest communities and "local actors" in FM?

Who are the key local actors and how they perceive fire management?

Group 1

- Government institutions.
- KLA participating in the Regional Protected Forest Committees: Space where fire management planning is carried out.
- With institutional and formal communicative interventions.



Group 2

- All fire prevention and firefighting brigades.
- Other actors closely linked to the brigades as “torreros” (tower observation to detected wildfires).
- Traditional fire users (whom sometimes are firefighters in their communities).
- Formal and informal communication between the different firefighting brigades.

Group 3

- KLA that are usually the most excluded in the formal planning of fire management.
- They have the worst perception of the fires (wildfire, burning).
- It is urgent to consider them and add them to the formal fire management planning networks.

Fire Management Plan for the MBBR

Plan integral del Manejo del Fuego en la Reserva de la Biosfera Mariposa Monarca: Acción e Investigación Participativa y Adaptable

Alternare

FMCN

FONDO MEXICANO PARA LA CONSERVACIÓN DE LA NATURALEZA, A.C.
Institución privada
20 años

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UNAM

Funding

- Funding

  - Fondo Sectorial SEP-CONACYT "Efecto de perturbaciones naturales y humanas en bosques de coníferas de la Reserva de la Biósfera Mariposa Monarca: Implicaciones para el manejo del fuego" (proyecto 154434)
  - Convenio con Alternare A.C. Fondo Mexicano para la Conservación de la Naturaleza "Generación de un Plan Integral del Manejo del Fuego en la Reserva de la Biósfera Mariposa Monarca: Acción e Investigación participativa y adaptable"
  - Fondo PAPIIT-UNAM Sinergias de disturbios naturales y humanos en bosques montanos en el oriente de Michoacán (proyecto IN209716)

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Thank you, gracias!