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FUNDACION  
GONZALO RÍO ARRONTE, I.A.P.



CONAGUA  
Comisión Nacional del Agua

# MEXICAN NORM OF ENVIRONMENTAL FLOWS

## A public policy for water management through the hydrological regimen conservation

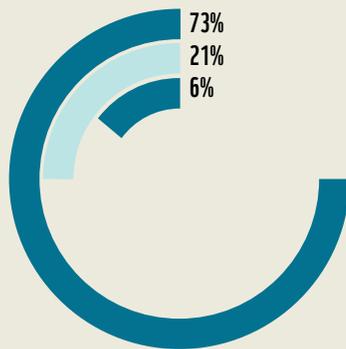
### Background

Since 2004, the Alliance WWF-Gonzalo Río Arronte Foundation, I.A.P. (FGRA), in collaboration with National Water Commission (CONAGUA) and others federal agencies, as well as academic institutions, Non-Governmental Organizations (NGO), water users and rural communities, has developed three different proposals of Environmental Flows (EF) in river basins with different conservation, water pressure and management contexts: i) Conchos river in Chihuahua; ii) Copalita-Zimatán-Huatulco rivers in Oaxaca; and iii) San Pedro Mezquital river in Zacatecas, Durango and Nayarit.

Two core principles adopted are the natural flow paradigm<sup>1</sup> and the biological condition gradient<sup>2</sup>. Considering this, the natural flow regime is recognized as the main driver of change in a variable physical environment, in which ecosystems and species live and are adapted, and therefore, its alteration drives to ecosystems and biological integrity degradation

### The use of environmental objectives

The EF regime should be determined based on the associated environmental objective, according to the basin's ecological importance and water pressure, whether surface streams, receptive bodies of diverse kinds, or as part of the associated aquifer's natural discharge, to conserve and protect the environmental conditions and promote ecological balance.



From 33 sites analyzed in detail in the three river basins, in 73% of the cases EF occurs under current conditions; in 21%, management requires regulation in the conditions of water extraction and in operation of infrastructure; and only in 6% is it necessary to make adjustments in the water allocation to users. These results were systematized for the proposed Mexican Norm (NMx).

CONAGUA, as the top authority in administration, management and conservation of water resources, called and led a work group for developing the NMx of EF, in which the Alliance of WWF-FGRA was invited as technical secretariat due its experience in the field.

The goal of the group was to establish a technical procedure and its specifications for determining EF regime in streams or national water bodies in a hydrological basin, whose implementation and results helps on annual water availability and allocations, as well as infrastructure development or works that involve water transfer among basins and the like.

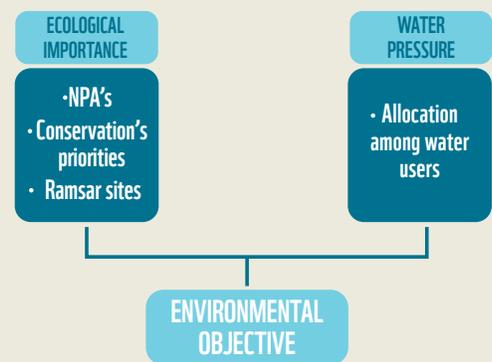


Figure 1. Conceptual model of environmental objectives

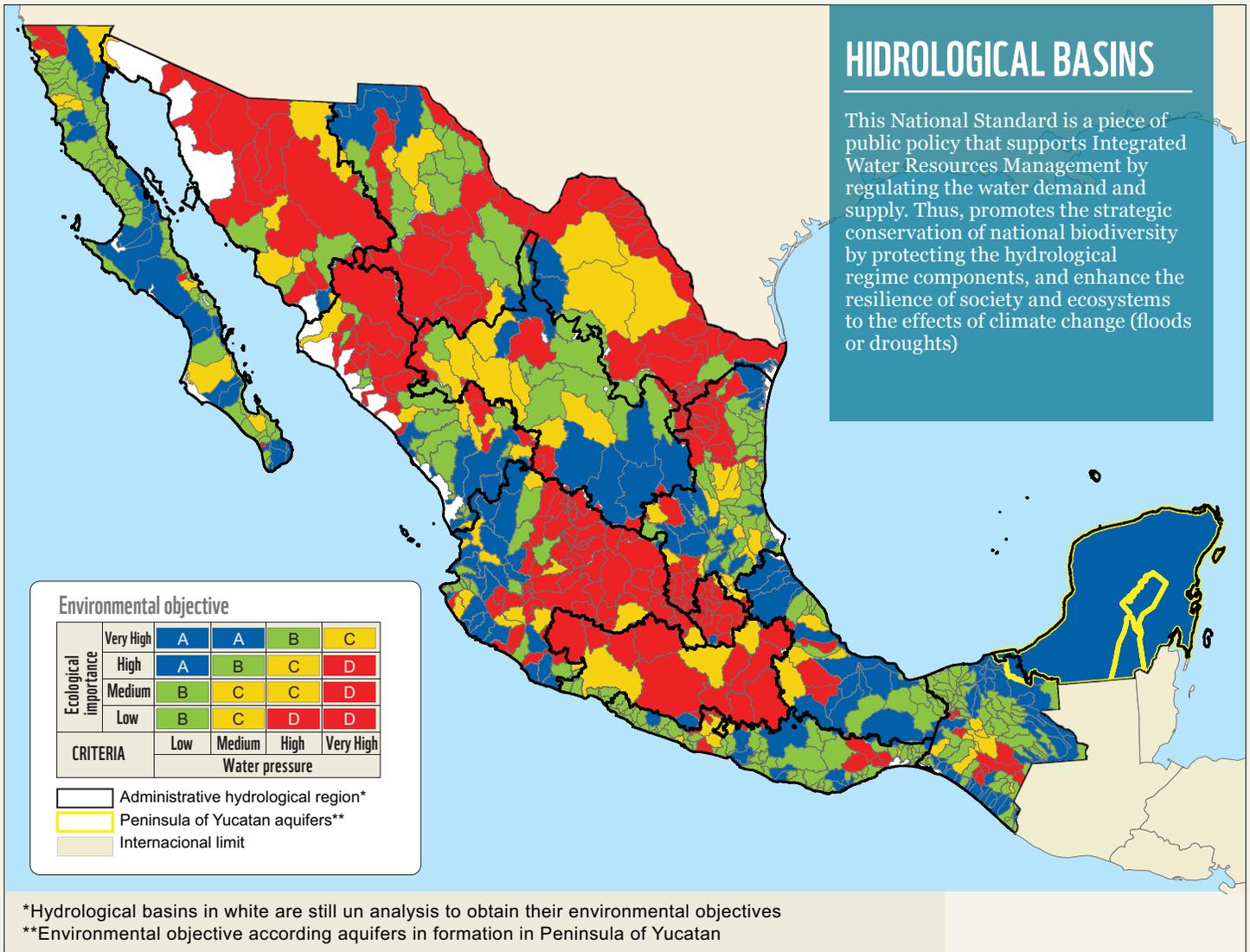
Environmental objectives represent the ecological state that is intended to be obtained or preserved in the basin. They establish the relationship between the value of conservation (ecological importance) and its implication for the productive uses of water (water pressure)

1. Poff N.L., J.D. Allan, M.B. Bain, J.R. Karr, K.L. Prestegard, B. Richter, R. Sparks and J. Stromberg. 1997. The natural flow regime: a new paradigm for riverine conservation and restoration. *BioScience* 47:769-784.
  2. Davies S.P. y Jackson S.K. 2006. The Biological Condition Gradient: A Descriptive Model for Interpreting Change in Aquatic Ecosystems. *Ecological Applications*: Vol. 16, No. 4 pp. 1251-1266
- USEPA. 2005. Use of Biological Information to Better Define Designated Aquatic Life Uses in State and Tribal Water Quality Standards: Tiered Aquatic Life Uses.

# The methodologies

Hydrological, hydrobiological or habitat simulation models and holistic are valid to the NMx of EF implementation if they take in to practice the core principles adopted, in other words:

- It must allow for understanding of the ecological significance of each flow regime component, and generate functional proposals for its conservation or reestablishment
- The proposal must consider the natural hydrological variability for ordinary (low flows) and extraordinary (high pulses and floods) conditions
- It recognizes that an aquatic ecosystem modifies its features in response to an increase in stress levels, and therefore, it allows adjustment to proposals to the environmental objectives or conservation of the river



Map 1. Environmental objectives of hydrological river basins

### Institutions involved in the Mexican Norm project

Federal Electricity Commission, National Water Commission, Natural Protected Areas Commission, National Commission for Knowledge and Use of Biodiversity, Institutes of Biology and Engineering of the National University of Mexico, Mexican Institute of Water Technology, National Institute of Ecology, Secretariat of Environment and Natural Resources, The Nature Conservancy and World Wildlife Fund for Nature, Inc. Mexico Program.

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 To stop the degradation of the planet's natural environment and to build a future in which humans live in harmony and nature.