

**INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES AND MEXICO
MEXICAN SECTION**

**(SEAL Secretariat of
Foreign Relations)**

TRANSLATION

No.: LAE 01859/00

File: LAE/33

Ciudad Juárez, Chih.

October 10, 2000

**Eng. John M. Bernal
United States Commissioner
United States Section
International Boundary and Water Commission
The Commons Building C, Suite 310
4171 North Mesa
El Paso, Texas 79902-1422**

Dear Engineer Bernal:

I refer to my letter No. LAE 1012 of May 22, 2000 concerning the impacts identified by Mexico in the context of the Colorado River Interim Surplus Criteria which is presently being developed by the United States Bureau of Reclamation (USBR). I also refer to the draft environmental impact statement and the meeting of May 12, 2000 in Mexico City, the latter in which the USBR presented this criteria concerning point 3.16.3 of the Draft Environmental Impact Statement (DEIS) "Consultations with Mexico". It mentions that "it is not clear to the USBR whether the concern of Mexico is due to the Interim Surplus Criteria and that the issues outlined in this concern are outside the scope of this report." Concerning this I inform you that in accordance with the report in reference any of the alternatives proposed will alter to a large or small degree the frequency and the magnitude of the flood flows that arrive in Mexico. This indicates that the concern of Mexico of the adverse impact of this criteria in Mexico is a real one and therefore should be considered as a serious one.

The Draft Environmental Impact Statement does not cover in detail the habitat and the composition of species in Mexico along the Colorado River. Nevertheless, there is documented information on this information as shown in the referenced paper, an example of this information are the documents "A Delta Once More" Restoring Riparian and Wetland Habitat in the Colorado River Delta, Washington, D.C., Environmental Defense Fund. Publications by Daniel F. Luecke, and others.

Concerning the impact on the commercial fisheries in the region, the Autonomous University of Baja California has developed a document entitled, "Comments on the Draft Environmental Impact Statement on the Interim Surplus Criteria, Colorado River" (enclosed), which provides an analysis of the impact of such criteria on the fishing productivity. At the same time, the study "Penaeid

Shrimp Landings in the Upper Gulf of California in Relation to Colorado River Freshwater Discharge," by Manuel S. Galindo Bect and Edward P. Glenn, suggests that the decrease in the discharge of Colorado River water to the Delta and its estuaries could adversely affect the production of shrimp (enclosed).

Finally, I make note of the referenced meeting in which there was emphasized that the identification of the physical and environmental impacts in my country would be made in a qualitative manner. This was in view of the short time frames provided for the presentation of comments. For this matter there was not sufficient opportunity to provide a response that would include specific studies on impacts in my country that would resulting from the Interim Criteria therefore in this manner I request that you consider the concerns expressed by Mexico that are directly linked to the implementation of the Interim Surplus Criteria.

I take this opportunity to reiterate the assurances of my most courteous and distinguished consideration.

Sincerely,
(Signed)

J. Arturo Herrera Solís
Mexican Commissioner

COMMENTS ON THE ENVIRONMENTAL IMPACT STATEMENT DRAFT OF THE INTERIM SURPLUS CRITERIA

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SUMMARY

The Autonomous University of Baja California, (UABC), disagrees with the four alternatives proposed in the DEIS as it considers that the only possible alternative, that would arrive at a no net loss to the environmental benefits, would be the no action alternatives or, that is, the baseline condition. We do not agree with the data provided in the notation 75R which indicates that the natural historic flows that arrive at Lee Ferry are less than 18.1 maf. This is shown in figure 1, which shows the flow regimens since the beginning of this century. The average value (18.1) obtained by the 75% of historical annual flows is probably considering the flows after the creation of Hoover and Glenn Canyon dams, constructed in 1935 and 1960, respectively. This last dam has stored river water for approximately 20 years (1960-1980), thus the average value obtained does not reflect the condition of no action at this time. We also note clearly that prior to the filling of Glenn Canyon Dam in 1980, the water volume considered as surplus and which was delivered to Mexico had a flow value similar to the river without the presence of the two dams. This extraordinary phenomenon was due to the unforeseen snow melt in the Rocky Mountains and resulted in a flow that could not be controlled in the United States.

The concept of an ecosystem that focuses on the overall management of the Colorado River basin, in which water also serves an interactive role in the basin health in totality, was not considered with the signing of the Treaty of 1944. This situation is also not covered in the current period. This is because the Lower Basin in Mexico is not considered, nor are these zone of influences in the Delta of the Colorado River and the Gulf of Mexico as a part of the ecosystem. Nevertheless, at the global level the governments have been presenting their preoccupation concerning the ecological equilibrium of ecosystem considering that the more important parts of the hydrologic basins and their influence in the marine zones are part of the world action program (PAM). Both countries should consider the Lower Basin of the Colorado River, the Delta and the Gulf of California in Mexico, in the management of the Colorado River as part of the ecosystem, and thus, the latter should not be affected.

The environmental impacts, and overall the impacts to the development of the Delta and the Upper

Gulf Region, are documented in Figure No. 2, in which the shrimp landing (the principal region activity) are analyzed, and its relations to the flows of the sweet waters of the Colorado river. One can see clearly that there is a direct proportional relation between the flows and the landings. Should any alternative for the Surplus Criteria be adopted, the economic and social development, of this part of the country, would be very seriously affected.

The economic impacts are as important as the conservation and preservation which have been dealt with in other cases.

INTRODUCTION

The control of the flow of the Colorado River through the dams in the U. S. and Mexico have provided the number of protests by non-government groups presented to both countries and have led to prolonged negotiation to determine the quantity and quality of the water that should be delivered to Mexico. The management of the river in U. S. dams and the utilization of water provided to Mexico through the 1944 Water Treaty for urban and agricultural activities has brought about a change in the ecological functioning of the Lower Basin of the Colorado River. This is especially when one considers the Upper Gulf of California Biosphere Reserve and the Colorado River Delta.

The flow variability in the river to the ocean is an aspect that has received very little attention on the part of both countries. The ecological alteration of the estuary as an area for breeding of many commercial species of great importance should represent one of the most relevant aspects in the control and management of the river flow. The flow of the sweet water to the ocean plays an important role in the equilibrium and productivity of the environmental estuaries not only because of the quantity of the flows but also because of the quality and seasonality of the same period. The alteration of one or more of the aspects pointed out should have ecological repercussions that are significant and are manifested in the first stages of development of the important commercial species. Also important, is that during a stage of their development these are esturine-dependant, including species such as shrimp, corvina and the totoaba. The latter is actually in danger of extinction. Secondly, reducing fish production in the region would, in the end, adversely affect the fishery communities that live with these resources as mentioned by Greenberg and Vélez Ibañez, (1994) and Mcquire and Greenberg, (1994).

ENVIRONMENTAL IMPORTANCE

The Delta of the Colorado River along the Montague and Pelicano Islands, represents a habitat of great importance to the marine species specially in the early stages of their development. This is a stage in which they seek food, refuge, and optimum hydrological conditions (esturine) for their development. This area is considered as a reproduction area, which for the development and breeding of species, will later be brought in in support of the fisheries of the region (Cabtree, 1989).

Considering the ecological importance and the proposal to protect the species that are temporarily or permanently inhabiting the region, the Government of Mexico has carried out three initiatives by means of decree. The first was in 1955 when the area was declared a marine wildlife refuge region. The second was in 1974 when the area was declared a reserve for cultivation and reproduction. The third was issued on June 10, 1993 as the "Upper California and Colorado River Delta Biosphere Reserve" (Official Daily, 1993; Morales-Abril, 1994). The primary objective of this last decree is to guarantee the protection of the biological and ecological values that allow the rational and sustainable utilization of the natural resources.

FLOW OF THE COLORADO RIVER BEFORE AND AFTER THE CONSTRUCTION OF THE DAMS

The average flow of the Colorado River before the construction of the dams in the United States was 20,700 mcm/year (Fradking, 1981). After nine years, the construction of Hoover Dam and within the legislation for use of the waters of the Colorado River, the U. S. - Mexico water Treaty of February 3, 1944 was signed. This Treaty provided to Mexico an annual volume of 1,850 mcm annually or approximately 10% of the annual flow of the river. The allotment of the annual amount of water to Mexico did not consider the environmental impact of reducing the amount of fresh water in the ecosystem.

IMPACT DUE TO RESTRICTION OF THE COLORADO RIVER

Sykes (1937), described changes in the esturine hydrology associated with the construction of Hoover Dam in the U.S. These changes included the loss of wet lands and habitat in the submerged areas and increased the erosion due to tidal action. There was also the loss of drainage, changes in vegetation and a decline in the abundance of fish, birds, and mammals.

Glenn *et al* (1995), mentioned that the biodiversity and the vitality of the wetlands have been affected, such that from 1973-1983, the fresh water and salt water mixing zones varied between 5,800 to 63,000 hectares. Nevertheless, since 1977, significant contributions of highly saline waters (2 to 3 ups) conveyed by the Welton-Mohawk quickly recuperated the last of the remaining marshes in the Colorado River (Glenn *et al*, 1992). Mellink *et al* (1997) pointed out to the importance of the lost wetlands available for aquatic birds which currently use the extensive fens in the mouth of the Delta.

Alvarez-Borrego *et al* (1975) and Hernández-Ayón *et al* (1993) mention that the Upper California and the Upper Colorado River Delta have lost to a large extent their esturine characteristics, except in some winter time conditions characterized by rainfall and increased by flows by the river due to excess flows from the reservoirs.

The freshwater inflow has a key role in the equilibrium productivity in the estuary environment. Not

solely because of quantity, but also because of quality and the variability of the flows. The alteration of one or more of the aspects above, could have social and economic repercussions that would be reflected in the reduction of fisheries production in the upper Gulf of California region.

Among the important aspects in the management of the river are the blue shrimp, *Litopenaeus stylirostris*, whose post larvae migrate upwards to estuary seeking food, protection, and optimal conditions for their development. This is in accordance with the life cycle of the estuarine dependant organism. The Upper California Gulf, even with its lack of river flows, is an area which is characterized as rich in inorganic nutrients and is highly productive (Hernández Ayón *et al.*, 1993). However, the ecological impact, to this species in particular, is not a problem of osmoregulation but rather the loss of a physical salinity barrier which provides protection and therefore avoids this specie being victim by the introduction of predatory species in the area. Also, the changes in the dynamic hydrology of the Upper Gulf decreases in intensity with a residual flow being perpendicular to the coast which is something that is vitally important for the transport of larvae to the coast.

Carbajal *et al.* (1997), designed a tri-dimensional model, not a linear one, to establish the theoretical behavior of the hydrodynamics of the estuary before the construction of the dams and the physical impact of the reduction of the flow to the sea. The model shows that the saline barrier located in the isohaline at 37 requires a flow of 2,000 cms in order to reduce the salinity to 15. Based on this model one could determine the minimum dimension of the estuary in accordance to the requirements for its ecological restoration.

ANALYSIS OF THE SHRIMP LANDS IN THE UPPER GULF OF CALIFORNIA

The shrimp fisheries represent an important source of economic revenues for communities in the Upper California. Galindo-Bect *et. al.* (2000). In their analysis of the historical behavior of the fisheries, their study shows that the landings from San Felipe have been very irregular with increases and decreases related to the variable flow of the Colorado River. It is clear that this crustaceous response to physical impulses stimulated by the presence or absence of fresh water in the breeding area.

In 1980, when the flow of the Colorado River received by Mexico was at some 17,500 cm per year, a flow comparable to the river before the dams, the commercial fishery captures were the greatest in history of the industry (Figure 2). This also shows the observation that there is a biological response brought about by a physical influence, that is, greater landing of fish in relation to rainfall in the region (Figure 3), and added to this the existence of surplus flows of the river during these periods. For this reason, we consider that the difference between the maximum shrimp landings in 1980 with respect to any other landings registered in history. The impact is brought about by the management of the waters of the Colorado River.

CONCLUSION

1. It should be recognized that the Lower Basin of the Colorado River does not end at the boundary with the U. S. and that the Upper Gulf of California and the Colorado River Delta Biosphere Reserve form part of the basin.
2. That the management of the river water in both countries is altering the ecological operations of the Lower Basin of the Colorado River.
3. There is disagreement with the proposal by the U. S. to distribute the surplus flows of the Colorado River, as these will cost greater ecological deterioration as well as economic and social damage in the Lower Basin and the Upper Gulf in Mexico.
4. The ecological deterioration mentioned has created a social and economic crisis in the riparian communities that depend on the biotic and antibiotic resources impacted and that the problem would be more aggravated if the proposal by the U. S. for the use of surplus waters is approved.
5. *[sic]* A allocation of water specifically dedicated to ecological restoration should be considered.
5. *[sic]* There is objection to the proposal of the U. S. to line the All American Canal because this will impact the groundwaters in Mexico.
6. *[sic]* There should be a respect to the international standards for the management of river waters when this river passes through one or more countries.

LITERATURE CITED

(Refer to original)