J. Stephen Leatherwood Memorial Award Winner: Yi Han

Title:
Habitat changing processes in the middle and lower reaches of the Yangtze River: A case study of the Yangtze finless porpoise

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Abstract:
The Yangtze River is under substantial destruction due to accelerating anthropogenic disturbances in the past few decades. Though ecological studies have contributed to conservation practices, critical questions remain to be investigated: how the Yangtze River ecosystem changed spatially and temporally, what the key habitat change events were, and how these changes consequently affected species and biodiversity. A better understanding of these issues can inform policy-making and conservation practices.

In this study, we select the Yangtze Finless Porpoise as the indicator species given its critically endangered status and its important role as an umbrella species, to investigate how habitat loss and fragmentation affect its abundance and distribution at a large spatial-temporal scale. First, a GIS database of historical abundance and distribution of the porpoise in the middle and lower reaches of the Yangtze River were constructed based on the survey records from 1985 to 2016. Correspondingly, we use satellite images to map the distribution of seasonal floodplains (i.e. key habitats for the porpoise) each year; and then we calculate metrics indicating habitat changes such as the total area of floodplains, the area of major floodplains and their spatial configuration. Spatial analyses are applied to explore whether and how the porpoise abundance and distribution correlate to floodplain changes over time.

The preliminary results show that the total area of floodplains and the area and number of major floodplains decreased through time, which positively correlate to the porpoise population decline and disappearance on specific sites. The results also suggest that changes in the spatial configuration such as the rapid disappearance of floodplains between Yichang and Wuhan may have led to the distribution gaps of the porpoise. These outcomes can help to elucidate the process of porpoise population decline under a rapidly changing ecosystem and inform more specific and targeted conservation strategies.