

FINAL REPORT: The influence of ship traffic on the behaviors and echolocation of Yangtze finless porpoise (*Neophocaena asiaeorientalis asiaeorientalis*) in the lower reaches of Yangtze River

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Yangtze finless porpoise (YFP) is critically endangered and relies on its biological sonar sensing system for important life activity. The rapid development of the Yangtze valley has brought busy shipping and vessel noise. Spatial-temporal variations in the biosonar activity of YFPs and underwater noise pollution between non-shipping and shipping channels will provide information useful for YFP conservation. Two points located in shipping channel and non-shipping branch were selected. Passive acoustic monitoring was used to record porpoises' biosonar signals and underwater noise. The number of click trains, echolocation encounters, buzzes and buzz ratio was counted and the root mean square sound pressure level of noise was calculated in five diel phases respectively. Then, the non-parametric test was performed to analyze the differences among different phases and between different monitoring points. Spearman Correlation analysis was used to analyze the relationship between underwater noise and biosonar activity. Significant spatial-temporal patterns were observed in both biosonar activity and ambient noise. Average biosonar activity, including click trains, buzzes, buzz ratio and echolocation encounters, was higher in the non-shipping channel than in the shipping channel, whereas an opposite trend was observed in the noise level. In the non-shipping channel, the buzz number and buzz ratio, indicators of porpoise feeding activity, were higher at night than during the day, whereas the noise level was lower at night than during the day. These findings may be associated with the noise avoidance strategies of YFPs to adapt to the busy shipping on the Yangtze River. Maintaining the non-shipping status of some branches of the Yangtze River can provide more shelters for the YFPs. And strengthening the measures of banning navigation at night or reducing the sailing speed at night in the lower reaches of the Yangtze River will benefit the YFPs' predation at night. The result has been published.