The frequency of scraping trees by kayaking in mangrove estuary in Okinawa, Japan

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Introduction

Okinawa is the southernmost prefecture of Japan. Subtropical natural features attract a lot of tourists from all around the world. About six million people visit Okinawa annually. Gesashi river is located in northern part of Okinawa main island. In the estuary of Gesashi River, there is rich mangrove forest which is designated as a National Natural Monument. Tourists enjoy seeing the mangrove forests through kayaking led by the guides. The number of tourists in the river has increased recently and there are concerns about ecological impact by kayaking on the mangrove forest. Recently the association of guided tour operators is developing rules of kayaking recreation, whereas the exact information about visitors and the ecological on the forest is limited. In this study we examined the frequency of scraping on mangrove trees by kayaking via interviews and questionnaire surveys to examine the ecological impact of kayaking for the mangrove forests.

Method

We conducted interviews of guided tour operators and questionnaire survey of visitors. Seven companies or personal guides are operating guided kayaking tours in Gesashi river. Three operators accepted our requests of interviews about the tour operation and ecological impacts. We asked them about the scraping frequency on mangrove trees by kayaks during guided tours. We conducted questionnaire survey with the corporation of tour operators. Visitors were asked to answer the questionnaire after the kayaking tour. We asked them their demographic attributes, the past kayaking experience, and about the recognition of scraping on mangrove trees by their kayaks or paddle; Respondents were 194 kayakers (114 male, 80 female). 70 percent of respondents kayaked for the first time and 95 percent of respondents kayaked in Gesashi River for the first time. We also counted the number of tour groups and kayaks during questionnaire surveys. The density of kayaks on the river was estimated.

Results

Guided tour operators did not consider kayaks' scraping on mangrove trees frequently (do they mean the 'tour operators did not frequently consider' as in they never thought about it, or that the 'tour operators did not consider that the kayaks' were frequently scraping' as in they did not think it happened often?. They had different opinions about the ecological impacts of kayaking on the mangrove forests. Some of tour guides pointed out the impact of evacuating fish-boats and fishing nets during the brunt of the typhoon rather than kayaking.

More than 70 percent of respondents answered that their kayak or kayak's paddle scraped the mangrove trees (44% = only kayak, 58.7%= only paddle). First timers reported more frequencies of scraping on mangrove trees than experienced respondents (47.6% = first timers; N = 147, 36.2% = experienced respondents; N = 47). The size of the tour group and the density of kayaks also affected the frequencies of mangrove scraping by visitors. The respondents who attended larger size of tour groups reported more frequencies of mangrove scraping. In addition, the respondents who visited the river on the crowded time reported more frequencies of scrapings.

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Conclusion

According to the results, scraping on mangrove trees by kayaking occurred frequently, and it was affected by the degree of kayaking experience, the size of tour group, and the density of kayaks. The results provide several implications for guided tour operators to formulate better rules for recreational kayaking. However, the correlation between the frequency of scraping and the mangrove forest's damage is not clear. There are many possible factors of ecological impact on vegetation (Kuss et al., 1990). Further research needs to be conducted to clearly establish the ecological impact of the mangrove forests that this frequency of scraping has on the mangrove forests.

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