

Problem Chosen

A

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Summary Sheet**

Team Control Number

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test

Summary

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1 Introduction

1.1 Problem Restatement

Finless porpoise is the only freshwater mammal in the Yangtze River at present, which is distributed in the middle and lower reaches of the Yangtze River, Dongting Lake and Poyang Lake, and its population has decreased dramatically in the past 20 years. According to the statistics, the number of finless porpoises in the Yangtze River was more than 2,700 in 1991. However, in the year of 2006, there were fewer than 1,800 finless porpoises surviving in the area. In 2011, there were probably just over 1,000 of them, and in 2018 there were about 1,012.

In fact, since the 1980s, the ecologists along with the government had explored and developed three conservation strategies: in situ conservation, ex situ conservation and artificial breeding. Among them, ex situ protection, that is, selecting some waters with similar ecological environment to the Yangtze River to establish ex situ protection, is the most direct and effective measure to protect the Yangtze finless porpoise.

China has set up five ex-situ protected sites until now, in which more than 150 Yangtze finless porpoises are conserved. On September 18, 2021, CCTV reported that the population of the Yangtze finless porpoise is growing steadily. The population decline of the Yangtze finless porpoise has been curbed, but its critically endangered status remains unchanged.

Based on what has been discussed above, please address the following problems:

- 1 Establish a mathematical model to predict the population number of finless porpoises in five ex situ protected areas after 20 years, and explain how the sex ratio of 150 finless porpoises in ex situ protected areas affects the population development of finless porpoises.
- 2 Will the Yangtze finless porpoise become functionally extinct without ex situ conservation strategies?
- 3 Based on your analysis, please submit no more than 2 pages of recommendations for the protection of finless porpoises to the relevant authorities.

1.2 Overview of Our Work

2 Assumptions and Justifications

3 Notations

4 Model I: Directed Network of Musical Influence Model

5 Sensitivity Test

6 Evaluation of Model

7 Conclusions

Table 3.1: Notation Descriptions

Symbol	Definition
\mathbf{A}	A set of artists given in dataset
\mathbf{G}	A set of genres provided in dataset
f_i	The total number of followers of artist i , $i \in \mathbf{A}$
g_{ij}	Genre tag between artist i and his or her follower j , $i, j \in \mathbf{A}$
DAS_i	Artist i 's decade of active start, accurate to 10 years
r_{ij}	Respective Influence of influencer i over follower j , $i, j \in \mathbf{A}$
w_i	Artist i 's weight of normalized indexes
TI_i	Artist i 's Total Influence
wf_j	The parameter of follower j ' influence, $j \in \mathbf{A}$
wt_i	The weight of artist i 's Total Influence, $i, j \in \mathbf{A}$
cg_{ik}	Artist i 's Contemporary Influence in certain genre, $i \in \mathbf{A}, k \in \mathbf{G}$
c_i	Artist i 's Contemporary Influence, $i \in \mathbf{A}$
S_{ij}	Similarity between artists i and j

REPORT

To: ICM society

From: ICM Team 2104997

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References

- [1] Wang Kexiong and ZHANG Xianfeng. (1999) Population viability analysis for the Yangtze finless porpoise. Bulletin of the Chinese Academy of Sciences:English Edition 27.1:3473-3484.
- [2] He Gang, Wu Bin, Wang Weiping and Wang Haihua. (2021) Analysis of Population Viability Analysis of Yangtze Finless Porpoise in Different Simulated Scenarios. Progress In Fishery Sciences. 42(2):28-35.DOI:10.19663/j.issn2095-9869.20200202003.

Appendices

Input matlab source: