

Comisión Interamericana del Atún Tropical
Inter-American Tropical Tuna Commission



Preliminary results on automatic set classification

J. Lopez*, C. Lennert-Cody, M. Maunder

*jlopez@iattc.org

Prediction of purse-seine set types: preliminary analyses

- **Background:**
 - Raised by the previous WG-FADs and part of J.2 project.
- **Data**
 - AIDCP observer data for Class-6 vessels, 2013-2017
- **Variables used in the analysis**
 - Operational information
 - Environmental information
 - Catch and bycatch information (excluding any information on dolphins)
- **Methods**
 - Algorithms were built separately for each year.
 - Two different random forest algorithms were developed to predict set type:
 - Mammal/Unassociated/Floating-object
 - Mammal/non-Mammal (= Unassociated + Floating-object)

Prediction of purse-seine set types: preliminary analyses

- **Results**

- The preliminary algorithm appears to perform well; better performance may be achieved with more refined models/algorithms.
- The poorest performance was for Unassociated sets.
- The misclassification error shown below is the proportion of sets for which the reported set type did not match the predicted set type.

- **Mammal/Unassociated/Floating-object**

Misclassification error	2013	2014	2015	2016	2017	Av (sd)
Mammal	0.022	0.023	0.022	0.025	0.020	0.022 (0.001)
Unassociated	0.115	0.109	0.109	0.141	0.116	0.118 (0.01)
Floating-object	0.048	0.047	0.056	0.046	0.047	0.048 (0.004)

- **Mammal/non-Mammal**

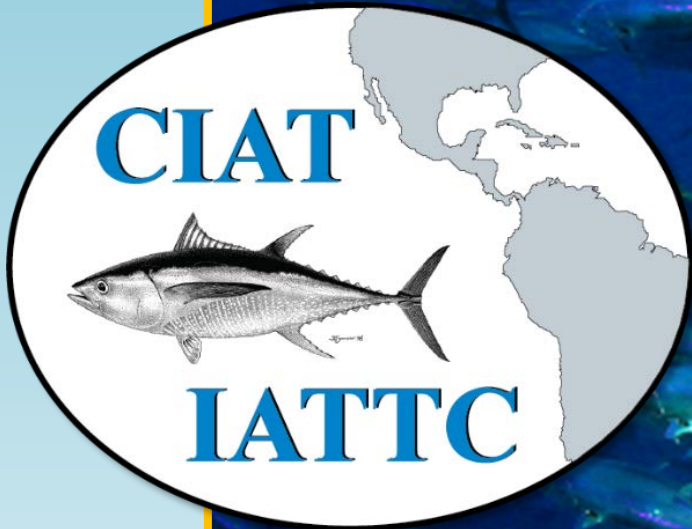
Misclassification error	2013	2014	2015	2016	2017	Av (sd)
Mammal	0.012	0.010	0.012	0.013	0.015	0.01 (0.001)
Non-Mammal	0.040	0.038	0.043	0.047	0.034	0.04 (0.004)

Prediction of purse-seine set types: preliminary analyses

- **Future work**
 - Improve unassociated set classification error.

2016	DEL	UNA	OBJ	Error
DEL	10865	266	18	0.025
UNA	465	4213	226	0.140
OBJ	61	405	9764	0.045

- Add biodiversity/multidimensional indices and additional catch and bycatch size and species composition information.
- Other algorithms
 - BRT, CT, HMM, etc.
- Class 1-5 algorithm development.
- Stay tuned for SAC 2019.



Questions

