

AERIAL RADIOMETRY AND TUNA SURVEY : FRENCH POLYNESIA

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(ABSTRACT)

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Five hundred hours of aerial radiometry and tuna survey have been conducted in French Polynesia from February to December 1981. The Society Islands, the Tuamotu Archipelago and the Marquesas Islands were equally prospected. The results of these surveys are studied in conjunction with the hydroclimatic and fishing environment of French Polynesia.

Because of the scarcity of high thermal gradients, radiometry could not assist in tuna spotting in areas presenting thermic abnormalities. Flying time has been divided into "research effort units". These units take into account spotting conditions. This allows to compare areas under a variety of conditions.

During these surveys schools of tuna were sighted on 171 occasions. The sightings were mainly done over waters at 27-28°C and with either very sunny or very cloudy sky. Tuna school density decreased with distance from land for both the Society and Tuamotu Islands, but no such trend could be detected for the Marquesas Islands. However, bird flock density did decrease with distance from land in all three areas. Schools were usually skipjack. Most of the schools sighted were less than 30 tonnes. Schools were spotted at the surface more often in the Society Islands than in the Tuamotu or Marquesas Islands. Likewise, bird flocks were indicators of tuna more frequently in the Society Islands than in Tuamotu or Marquesas Islands. These tuna spotting surveys have demonstrated the importance of bird flocks in aerial sighting of tuna and the necessity to improve our knowledge on the relationships between bird and tuna.

The tonnage of tuna visible by plane has been roughly estimated for the best sampled areas. Simultaneous surveys employing fishing vessels and a spotting plane would be necessary to gauge the tonnage estimated by plane to the tonnage catchable by various fishing methods.

Based upon the results of our analysis, a brief development plan is presented. This plan proposes extended surveys by foreign tuna purse-seiners and pole-and-line vessels and the use of Floating Aggregative Devices. In this framework, serial spotting and airborne radiometry could be complemented by airborne measurements of conditions such as salinity, water colour... This airborne prospection could be coupled to results of satellite data analysis.