MEMORANDUM OF UNDERSTANDING

between:

THE PACIFIC ALLIANCE FOR SUSTAINABLE TUNA

and

THE INTER-AMERICAN TROPICAL TUNA COMMISSION

for

IN-KIND AND FINANCIAL SUPPORT TO CONDUCT A RESEARCH ON DOLPHINS COW-CALF SEPARATION DURING CHASING AND BACKDOWN

This Memorandum of Understanding (MOU) between the Inter-American Tropical Tuna Commission (IATTC) and The Pacific Alliance for Sustainable Tuna (PAST), hereinafter referred to as the "Parties, outlines the commitment of The Pacific Alliance for Sustainable Tuna (PAST) to provide in-kind and financial support for research on dolphin cow– calf separation during chasing, encirclement and backdown in purse seine fisheries in the Eastern Tropical Pacific Ocean.

The Pacific Alliance for Sustainable Tuna (PAST) is an alliance of Mexico's leading yellow-fin and skipjack fishing companies – Grupomar, Pesca Azteca, and Procesa – that joined together to ensure yellowfin and skipjack tuna fishery sustainably, and have agreed to operate according to best science practice to ensure responsible fishing across all aspects of their businesses, helping to protect the health of the fishery for the long term. PAST is committed to responsible, science-based fishing practice that is protects the full ecosystem and all species – including the long-term viability of the tuna populations themselves.

The Inter-American Tropical Tuna Commission (IATTC) is the intergovernmental Regional Fisheries Management Organizations is responsible for the conservation and management of tuna and tuna-like species as well as other associated species and ecosystems in the Eastern Pacific Ocean (EPO), pursuant to the 2003 "Antigua Convention". In accordance with the provisions of that Convention, it provides the Secretariat for the 1998 "Agreement on the International Dolphin Conservation Program" which aims at progressively reducing incidental dolphin mortalities in the tuna purse-seine fishery in the Agreement Area to levels approaching zero, through the setting of annual limits, with the goal of eliminating dolphin mortality in this fishery.

I. Purpose and Scope.

1. The purpose of this MOU is to set forth in general terms the scope of work and responsibilities of the Parties associated with a mutual collaboration plan to conduct scientific research on dolphin cow- calf separation during chase, encirclement and backdown by tuna purse seine vessels fishing tuna associated with dolphins in the Eastern Tropical Pacific Ocean (ETP), hereinafter referred to as the "Joint Research Project".

2. Both Parties, share a common understanding with regard to the relevance and importance of mutual cooperation to obtain scientific data to appropriately assess the level of incidence of separation, if any, between dolphin cow and calf during the chase, the encirclement and the backdown carried out by the tuna purse seine vessels in the ETP.

3. Both Parties recognise that they can work with other institutions, on any similar project, or to obtain collaboration and assistance from other institutions or non-Parties to achieve the objectives of this MOU. For transparency purposes, the policy of the IATTC regarding joint research projects with other organizations is attached as Appendix A; and PAST understands that its joint activities with IATTC as described in this MOU will be consistent with this policy.

II. Responsibilities:

1. Both Parties will cooperate to implement the working plan as described in Appendix B.

2. PAST specifically commits to:

   i. Provide IATTC with an in-kind contribution consisting of:
      - one purse seiner or more with helicopter and accommodations for two scientists plus an IATTC observer;
      - A seat for a scientist aboard the vessel's helicopter during chases. The scientist will need good visibility of the chased dolphin herd, particularly the rear of the herd, to detect any motherless calves leaving the herd. The research is designed to have little or no effect on tuna catches or fishing operations

   ii. Provide IATTC with the funding required to cover the budget described in Appendix B, as follows:
      - a first payment for an amount of US$ 250,000 made by the signature of this Memorandum of Understanding;
      - payment of the remainder of US$248,000, four (4) months after the first payment.

      It is understood that any unspent amount will be returned to PAST.

   iii. Respect the needs of IATTC to publish the results of the studies conducted under this Memorandum of Understanding.

3. IATTC specifically commits to:

   i. Receive the in-kind contribution of PAST, in compliance with all the legal formalities necessary for the conduction of the aforementioned studies; and to collaborate with PAST to achieve the objectives of this Memorandum of Understanding; and

ii. Assist with technology and expertise transfer as appropriate to effectively deliver the terms and objective of the Memorandum of Understanding.

4. Both Parties agree to share and make available to the public the results of the Joint Research Project.

III. Confidentiality

1. Both Parties recognize that the results of the research and any reports there from will be considered for publication.

2. The general policy of the IATTC regarding confidentiality as part of collaborative projects is summarized in Appendix 1. PAST understands that its joint activities with IATTC will be consistent with this policy.

IV. Enforcement and terms of Agreement

Hold Harmless. Each Party acknowledges that it shall be responsible for any loss, cost, damage, claim or other charge that arises out of or is caused by the actions of that Party or its employees or agents. As between the Parties, no Party shall be liable for any loss, cost, damage, claim or other charge that arises out of or is caused by the actions of any other Party, employees or agents. Joint and several liabilities will not attach to the Parties.

Use of PAST and IATTC names: Except as provided in this AGREEMENT, the Parties shall not refer to the other Party's name or to any of its staff or facilities in any manner or through any medium, whether written, oral, or visual for any purpose whatsoever, without the prior written approval of that Party's Contractual Representative.

Relation of the Parties: The Parties, by this Agreement, do not intend to create a partnership, principal/agent, or joint venture, and nothing in this Agreement shall be construed as creating such. This is a non-exclusive agreement.

Effective date: This MOU will be valid for the duration of the study.

BOTH PARTIES, HEREBY affirm their commitment to conduct good faith efforts to complement, enhance, expand and constructively use their available resources and services for the benefit of the scientific community and the general public.

In WITNESS HEREOF the Parties have executed this MEMORANDUM OF UNDERSTANDING on the 24th day of May 2022

On behalf of the IATTC	On behalf of PAST
Jean-François Pulvenis Director *ad interim*	Mariana Ramos Executive Director

APPENDIX A

IATTC policy regarding joint research projects with other organizations

The following guidelines constitute the policy of the IATTC regarding joint research projects and agreements with other organizations:

1. At the recommendation of the staff and with the approval of the Director, joint research agreements with other organizations may be established.

2. Any joint research agreements established with other organizations shall be limited to research matters within the competence of the IATTC.

3. Prior to the start of any joint research project, the general provisions and schedule for the project will be summarized in an Agreement (AGREEMENT) signed by the Director of the IATTC and a representative of the collaborating organization.

4. Collaborating organizations shall be required to provide monetary compensation to the IATTC for joint research conducted at IATTC facilities.

5. An AGREEMENT shall include, *inter alia*, the following:

   a. The responsibilities of IATTC staff members are to work jointly, but not exclusively, with the collaborating organization on the research described in the AGREEMENT.

   b. Since the IATTC is a multinational research organization, all equipment, activities and results of joint research conducted at IATTC facilities will be available to IATTC member countries, and all results of such research may be published and may not be held as confidential.

   c. The results of joint research conducted at non-IATTC facilities may be treated as confidential, at the discretion of the collaborating organization.

6. Any public announcements concerning any joint research project must be approved in advance by the Director of the IATTC and by the collaborating organization.

APPENDIX B

Research project
Dolphin cow-calf separation during chasing and backdown

INTRODUCTION

With the drastic decrease in dolphin mortality due to entanglement in tuna purse-seine nets during the 1990s, more attention was paid to other possible sources of mortality. Also, some studies have shown that in the 1980s and 1990s there were cases of orphaned nursing calves due to maternal mortality. It has also been suggested that mothers and calves may be separated during chases leading to purse seine sets.

In the absence of the historical record of evidence to this effect, the objective of this study is to resolve this question by determining whether dolphin mothers and calves are indeed separated during chase or backdown. Direct observation methods will be used; a scientist and video camera aboard the ship's helicopter will observe and record any separation during the chase and a video camera mounted on a remote-controlled hexacopter will be used to record any separation during and after backdown.

REQUIREMENTS

1) One seiner with a helicopter and accommodations for 2 scientists plus an IATTC observer.

2) A seat for a scientist aboard the vessel's helicopter during chases. The scientist will need good visibility of the chased dolphin herd, particularly the rear of the herd, to detect any motherless calves leaving the herd. The research is designed to have little or no effect on tuna catches or fishing operations.

3) A research permit to allow this research to be conducted issued by each country in whose waters the purse seiner may fish.

SAMPLE SIZE REQUIREMENTS

Cow-calf separation, if it occurs, should be a rare event; and there has been slow, but not significant, growth in dolphin populations (Gerrodette et al. 2008). However, the hypothesis that no mother-calf separation occurs may be problematic. While an observation of such a separation may disprove this hypothesis, numerous cruises and a large number of sets may be necessary to observe such a rare event, if it occurs at all. A more practical approach is to determine the sample size needed to disprove the hypothesis

that cow-calf separation is frequent enough to affect population growth rate. To determine the sample size and sampling design needed to best answer this question, this proposal includes a workshop involving experts in the relevant fields: dolphin biology and tuna purse-seine fishery, statistics, video recordings, and drone operators with experience in marine mammal studies.

FIELD METHODS

The purse seiner used for research will operate as normally as possible to ensure that fishing operations are as representative as non-research trips. The observer will maintain a normal log and record the time and occurrence of research activities. The main differences from a normal operation will be:

11) A video camera will be mounted below the helicopter used to detect dolphin herds and a scientist will be aboard the helicopter to detect separation of mothers and calves during the chase. The helicopter will follow the dolphin herd from behind during the chase so that the observer and video camera can detect any dolphins that lag behind the herd.

2) A pair of GPS units, one aboard the helicopter and one aboard the purse seiner, will be mounted to simultaneously track the dolphin and purse seiner tracks. Comparison of these data will allow us to measure the distances dolphins travel while being chased, determine the time at which dolphins begin to flee in relation to the purse seine and purse seine operations, and determine the speed at which the dolphins are moving. All of these data will help us assess the potential for mother-calf separation.

3) During backdown, a drone equipped with a video camera will fly from the bow of the purse seiner to determine if separation between mothers and calves occurs during backdown. A speedboat may be launched with the drone operator on board to observe the herd at a greater distance from the seiner.) Se montará una cámara de vídeo por debajo del helicóptero utilizado para detectar las manadas de delfines y un científico estará a bordo del helicóptero para detectar la separación de madres y crías durante la persecución. El helicóptero seguirá la manada de delfines por detrás durante la persecución para que el observador y la cámara de vídeo puedan detectar cualquier delfín que se quede atrás de la manada.

These field methods may be adjusted or modified as necessary, taking into account, among others, the results of the workshop mentioned later in the schedule.

ANALYSIS

On board the ship, the scientists' observations from the helicopter and the ship will be reviewed and entered into computer databases. The videos will be reviewed and compared with field observations of mother-calf

separation. Several copies of the videos and databases will be stored on computers and USB keys.

The mother-calf separation data will be compared with the estimated values according to the different hypotheses identified in the workshop. These results may be presented to the Scientific Advisory Committee to discuss the analyses and their implications.

Additional analyses will be performed. Simultaneous monitoring of ship and helicopter positions may provide previously undocumented information on search patterns. Dolphin behaviors during the chase can be observed and detailed data collected on travel speeds and distances traveled. Videos can provide analysis of nearest neighbors, estimates of herd size, assessment of the physical condition of individuals, and frame-by-frame tracking of mothers and calves to confirm field observations.

PERSONNEL

Michael Scott (IATTC): Lead scientist, helicopter observer and member of the hexacopter team. Dr. Scott has been involved with tuna-dolphin research in the eastern Pacific Ocean for nearly 40 years and has participated in or led five purse-seine research cruises for the IATTC. His research has focused on tuna-dolphin association, dolphin and tuna group sizes, photogrammetric methods for estimating herd size and studying herd structure, and dolphin ecology. His work also supports the AIDCP observer program..

Pre-cruise logistics organizer: A San Diego-based graduate student will be responsible for purchasing and organizing research equipment, arranging travel and transportation, and training with the hexacopter team.

Hexacopter Team Leader: The IATTC had previously secured the cooperation of the SWFSC Photogrammetry Group, led by Dr. John Durban, to fly the drones and analyze the videos, as this group had more experience operating research drones in marine mammal studies than any other organization in the world. However, the core of this group now works for private environmental consulting firms and Oregon State University. Their expertise is critical to purchasing the right equipment, training our research team to work together to operate the system safely and effectively, and successfully completing the research.

Observer: An IATTC observer will record the collection and will be part of the hexacopter team. An observer will be chosen who has experience with the Mexican fleet and is bilingual.

Analysis of video data: A graduate student will review in detail videos of mother-calf separation, which may provide evidence of whether or not mother-calf separation is occurring. Other closely related studies include nearest neighbor analysis, herd size estimation, physical condition assessment of individuals, and herd structure.

TIMELINE OF PROGRAMMED ACTIVITIES

(Precise dates to be defined and programmed activities may be adjusted in response to the practical and circumstantial requirements for an efficient and effective implementation of the study)

- Obtaining commitment from one or more purse seiners to cooperate in the study.
- Organization of a workshop to discuss sample size and study design.
- Discussion of the potential use of the Director's DML allocation for any mortality that may occur.
- Receipt of first payment of funds, as described above.
- Holding of the workshop to calculate the sample size (in sets and cruises) needed to determine that no population effect is occurring. Discussion of the temporal and spatial coverage needed. Possible participants: Cleridy Lennert-Cody, Alex da Silva, and Michael Scott (IATTC), Karin Forney and Eric Archer (NMFS), Lisa Ballance and John Durban (Oregon State University), Mexican industry liaison.
- Confirmation of the schedule and availability of purse seiners
- Consultation with drone team to establish a task list, shopping list and timeline.
- Arrangements for a graduate student to analyze data in detail (nearest neighbor, herd size estimates, physical condition assessment of individuals, and frame-by-frame monitoring of mothers and calves to confirm field observations.
- Hiring a graduate student to assist with logistics, purchasing and preparations.
- Selection of an IATTC observer for the trip
- Contact with vessel owner and captain to explain and discuss the project and determine availability of accommodations for the scientific group.
- Select cruise period and port of departure.
- Visit the ship.
- Design the camera setup for the helicopter.
- Explain the study to the IATTC field office staff.
- Bring IATTC observer to the U.S. and begin team training with the drone.
- Continue equipment purchase and testing.
- When ship is in port: test video camera mount below helicopter and test video cameras in flight.
- Conduct of field survey.
- Preparation of initial field report.
- Hiring of graduate student to initiate photographic analyses.

BUDGET

(Items can be adjusted in response to the practical and circumstantial requirements of the implementation of the study but within the indicated limits)

Michael Scott, with a one-year contract (2022) to lead the project, with compensation based on his 2021 salary and benefits	$125,000
Two graduate students, on a one-year contract each, for pre-cruise logistics and post-cruise analysis assistance (USD33,500 each, no benefits)	$67,000
Contract for drone equipment, field work and photographic analysis, no benefits	$165,000
Six-month contract for IATTC observer as research technician	$27,000
At-sea pay (two scientists/two-month cruise)	$12,000
Travels	$10,000
Two high-resolution cameras for helicopter and accessories	$13,000
Hexacopters (2) [USD25,000 each], HD video cameras (3) [USD2000 each] and transport cases	$68,000
Two laptops, two GPS, and accessories (high-resolution monitors)	$11,000
TOTAL	**$498,000**