

ref: 2732

Is the endemic golden jelly in Jellyfish Lake, Palau, threatened by sunscreen?

Summary

State Party: Palau

Properties: Rock Islands Southern Lagoon

Type of Assistance: Natural / Conservation

Modality: Training

World Bank: UMIC

SIDs: Yes

Reference: 2732

Process Steps

- ✓ Submitted on Oct 30, 2014
- ✓ Approval by Chairperson on Mar 11, 2015

1. State Party

Palau

2. Title of project

Is the endemic golden jelly in Jellyfish Lake, Palau, threatened by sunscreen?

3. Type of assistance

	Emergency assistance	Preparatory assistance	Conservation and management
Culture			
Nature			✓
Mixed			

4. Project location

a) Will the project be implemented at a World Heritage property?

- Yes
 No

- Rock Islands Southern Lagoon

b) Will the project include a field component?

- Yes
 No

Where and how?

Jellyfish Lake (Ongeim'l Tketau), Rock Island Southern Lagoon (RISL), Koror, Palau, - samples will be collected from the marine lakes in the RISL, Koror, Palau utilizing the expertise of Coral Reef Research Foundation (CRRF) in Koror, Palau.

c) If the project is being implemented at a World Heritage property, indicate whether it will also benefit other World Heritage properties, and if so, which ones and how?

- Ha Long Bay
- East Rennell

East Rennell, Solomon Islands and Halong Bay, Vietnam are World Heritage properties that include marine lake (brackish water) habitats. Results of this work would be extremely relevant to the already high tourist use of marine lake sites in Halong Bay and the increasing tourist use of Lake Tegano, East Rennell.

5. Timeframe for the implementation of the project

Start date: April 1, 2015

End date: April 1, 2016

Duration: 12 month(s)

6. The project is:

- Local
- National
- Subregional
- Regional
- International

7. Justification of the project

a) Explain why this project is needed.

In 2013 Palau recorded over 105,000 tourists, and Koror State sold over 69,000 permits for Jellyfish Lake. As the number of lake visitors increases, the pressure of them and their impact on this unique environment will also increase. The main source of chemical pollution to Jellyfish Lake is undoubtedly from sunscreen products. In 2014, preliminary measurements of sunscreen compounds extracted from water and from the endemic Mastigias jellyfish in Jellyfish Lake, Palau, indicated that a low level of one compound, oxybenzone, was present (CRRF Report to Koror State: Sunscreen in Jellyfish Lake, 2014). It is imperative that further studies on the accumulation of sunscreen from tourists in Jellyfish Lake are undertaken.

Additional sampling of water and jellyfish tissue from Jellyfish Lake and from nearby marine lakes on the same island will help to understand the extent of this possible contaminant to these important marine lake habitats. A study will be designed whereby additional marine lakes on the same island that are not used by tourists will be sampled, in addition to Jellyfish Lake. Samples from control lakes on a different island will also be collected, as well as from the surrounding ocean. This will put the results in perspective with respect to how the health of Jellyfish Lake compares to nearby and more distant marine lakes.

These test results will enable managers to make informed decisions about the protection of the marine lake habitats in Palau and their endemic jellyfish.

b) List all supporting documents submitted, if applicable.

Documents

- CV_expert 1
- CV_expert 2
- CV_expert 3
- CV_expert 4
- CV_expert 5
- CV_expert 6
- Investigation of Sunscreen Accumulation in Palau Marine Lakes

8. For emergency assistance only

a) Describe the actual or potential threat/danger affecting the property

N/A

b) Indicate how it might affect the property's Outstanding Universal Value

N/A

c) Explain how the proposed project will address the threat/danger

N/A

9. Objectives of the project

1. Are sunscreen compounds found in the lake water and in the endemic *Mastigias papua etpisoni* jellyfish in Jellyfish Lake (used by tourists) in reportable amounts?
2. Are sunscreen compounds found in the lake water and in the endemic *Mastigias papua salii* jellyfish in Clear Lake (not used by tourists), 2 km distant from Jellyfish Lake, in reportable amounts?
3. Does sunscreen originate from tourists?
4. Is the groundwater in Mecherchar Island contaminated with sunscreen?
5. Do the endemic *Mastigias medusae* bio-accumulate sunscreen?

10. Expected results

Clearly state the **results** expected from the project and define the **indicators** and **means of verification** which can be used to assess the achievements of these results

Expected results	Indicators	Means of verification
Expect to detect sunscreen compounds in analyzed water and tissue samples from Jellyfish Lake.	The presence of reportable amounts of sunscreen in water and tissue samples from Jellyfish Lake.	Consistent results of multiple samples of water and tissue from Jellyfish Lake.
Expect to detect sunscreen compounds in analyzed water from Clear Lake, but not in tissue samples.	The presence of reportable amounts of sunscreen in water samples from Clear Lake, but not in tissue samples.	Consistent results of multiple samples of water and tissue from Clear Lake.
Expect to detect more sunscreen compounds in analyzed water collected near tourist entry point in lake than from center of Jellyfish Lake	The presence of higher reportable amounts of sunscreen compounds in analyzed water collected near tourist entry point in lake than from center of Jellyfish Lake.	Consistent results of multiple samples from the tourist entry point in Jellyfish Lake.
Expect to detect sunscreen compounds in analyzed water from 2 lakes located between Jellyfish Lake and Clear Lake, indicating water table connecting lakes is contaminated.	The presence of reportable amounts of sunscreen in water from 2 lakes located between Jellyfish Lake and Clear Lake, indicating water table connecting lakes is contaminated.	Consistent results of multiple samples from each of the two lakes between Jellyfish Lake and Clear Lake.
Expect to detect higher levels of sunscreen compounds in jellyfish tissue samples relative to lake water samples in Jellyfish Lake and 3 other lakes with endemic jellyfish	The presence of higher levels of sunscreen compounds in jellyfish tissue samples relative to lake water samples in Jellyfish Lake and 3 other lakes with endemic jellyfish.	Consistent results of multiple water and tissue samples from Jellyfish Lake and 3 other lakes with endemic jellyfish

N/A

11. Work plan

Activities	Time Frame (in month)											
	Year 1											
Months	1	2	3	4	5	6	7	8	9	10	11	12
final experimental design and coordination with chemist colleagues.	✓	✓										
sample collection and shipment to USA.			✓									
chemical analysis of samples				✓	✓	✓						
report of results to Palau World heritage committee							✓	✓	✓	✓	✓	✓

Year 2												
Months	13	14	15	16	17	18	19	20	21	22	23	24
final experimental design and coordination with chemist colleagues.												
sample collection and shipment to USA.												
chemical analysis of samples												
report of results to Palau World heritage committee	✓											

12. Evaluation and reporting

A full report of the experimental results will be provided to the International Assistance, World Heritage Centre within three months after the project is completed.

13. Profiles of specialists, trainers, technicians and/or skilled labour, if the project foresees the participation of such people

XXXX, Coral Reef Research Foundation, Director, Palau- Experimental design and sampling methods, analysis of results/reporting. CV attached.

XXXX, Coral Reef Research Foundation & University of California, Merced, USA Experimental design and analysis of results/reporting. CV attached.

XXXXX, Coral Reef Research Foundation, Palau- Project Manager, responsible for sample collection and shipping, assist in experimental design and reporting. CV attached.

XXXX, Coral Reef Research Foundation, Palau- Project Assistant, assist with sample collection and shipping, assist in experimental design and reporting. CV attached.

XXXX, Professor Aquatic Ecotoxicology, University of California, Riverside, USA Assist in experimental design and data interpretation. CV attached.

XXXX, Koror State Government Department of Conservation and Law Enforcement, Coastal Management Officer/Pride Campaign Manager, responsible for coastal management and social marketing outreach program for Koror State Conservation Areas and Rock Islands Southern Lagoon.

14. Key target audiences, including profiles of trainees / participants, if the project foresees the participation of such people

Trainees foreseen to participate in this project are intern students from local community college that will be interns for the Koror State Department of Conservation. Should this department be able to gain students involved with environmental science, recreational tourism, and or other related subject matter.

15. Budget breakdown

Items	Items Description	Amount x Unit USD	Total USD	Amount Requested to the World Heritage Fund USD	States party Funds USD	Other USD
Organisation						
Other		676x1 Unit	676	0	0	676
Total			676	0	0	676
Personnel / Consultancy service (fees)						
International Expert		4,556x1 Unit	4,556	0	0	4,556
National Expert		2,757x1 Unit	2,757	0	0	2,757
Coordinator		5,200x1	5,200	0	5,200	0

Items	Items Description	Amount x Unit USD	Total USD	Amount Requested to the World Heritage Fund USD	States party Funds USD	Other USD
		Unit				
Other	sample analysis	400x75 Unit	30,000	30,000	0	0
Total			42,513	30,000	5,200	7,313
Travel						
Other	boat fuel	445x1 Unit	445	0	0	445
Other	boat use fee	1,750x1 Unit	1,750	0	0	1,750
Total			2,195	0	0	2,195
Daily Subsistence allowance						
		0x1 Unit	0	0	0	0
Total			0	0	0	0
Equipment						
		0x1 Unit	0	0	0	0
Total			0	0	0	0
Evaluations						
		0x1 Unit	0	0	0	0
Total			0	0	0	0
Miscellaneous						
		0x1 Unit	0	0	0	0
Total			0	0	0	0
Total						
Total			45,384	30,000	5,200	10,184

b) Specify whether or not resources from the State Party or other sources are already available or when they are likely to become available.

Palau Visitors Authority (PVA) is a National Tourism Organization that can make available and contribute their resources to reach visitors about best practices and behaviour in regards to sunscreen use at Jellyfish Lake, after findings and results have been determined by the study. The Palau Visitors Authority has given their commitment to integrate any best practice guidelines in their promotional materials regarding best practice guidelines for Jellyfish Lake, Ongeim'l Tketau. Presently they have produced a new visitor guide book which has a page committed to best practice guidelines when at Jellyfish Lake, entitled "How can we keep Jellyfish Lake Healthy" and the value for this page is \$2000.00 USD. Moreover, they have recently unveiled a new tagline for Palau : - "Pristine, Paradise. Palau" and they are in the process of producing new print collaterals/ promotional materials to include this tagline. In which they have committed to continue to include important environmental tips and conservation tips in regards to the Jellyfish Lake and other unique sites within the Rock Islands Southern Lagoon World Heritage Site. Furthermore, these materials will be featured in PVA's Visitor Channel and other media outlets.

The Ministry of Community and Cultural Affairs is a resource, representing the State Party at the National Level and can have its resources available to take necessary actions to make the findings of this study a national priority for the community and visitors alike to recognize.

The Ministry of Natural Resources, Environment, and Tourism, has recently established a Bureau of Tourism (BOT) that will be the regulation and policy implementing body regarding the tourism industry and visitor recreational activities. The new Bureau is presently working closely with Koror State Government regarding tourism related matters and will work in collaboration with the State Government to adapt the State's Tour Guide Certification Program in a nation-wide program that will be needed in the future.

16. In kind contributions from the state party and other agencies

a) National agency(ies)

Palau Protect Areas Network has provided opportunities to support the State Government with capital assets that have enabled the state government to provide surveillance and monitoring at the state protected areas and at the designated site of this study, Jellyfish Lake, Ongeim'l Tketau. This in-kind contribution from Palau's Protected Areas Network under the Ministry of Natural Resources, Environment, and Tourism, is provided through direct monetary contribution for capital assets in the amount of \$38,000 USD.

b) Other bi/multi lateral organizations, donors, etc

Koror State Government: Sample analysis (balance of samples)- 13 samples @ \$400 ea = \$5,200

Coral Reef Research Foundation: USD5,628

In Kind contribution as follows: XXXX salary 1 mo. @ \$1666,

XXXX salary ½ mo. @ \$1,091,

Boat use fee: \$1,750- 7 days @ \$250/day,

Boat Fuel: 7 days @ 12 gal/day @ \$5.30/gal.;

15% overhead to cover internet & communications, freezer storage etc. \$676

Univ. of California, Merced: XXXX salary ½ mo. @ \$4,556

17. Agency(ies) responsible for the implementation of the project

KOROR STATE GOVERNMENT

18. Signature on behalf of state party

Full name: XXXX

Title: Minister of Community and Cultural Affairs, Republic of Palau

19. Annexes

Documents

- Signed request-31 October 2014