

**Marine Species Identification Workshop for the Puerto Rico  
Department of Natural and Environmental Resources Ranger Corps**

**May 15-16, 2007**



**By Eileen Alicea  
for  
NOAA Coral Reef Conservation Program**

**Acknowledgements:  
Myrna Abreu  
Zulena Cortés  
María del Mar López  
Aida Rosario  
Kelvin Serrano  
Capt. Jeanette Solís  
Photos by Eileen Alicea**

## **Marine Species Identification Workshop for Puerto Rico Rangers: Summary Report**

### **Summary:**

This project provided support for fisheries and coral reef enforcement in Puerto Rico in the form of two trainings: 1) Marine species identification workshop for rangers; and 2) Training exchange between enforcement officers, hearing officers, judges, and biologists. The project also produced an out-of-the-water fish photo series for the Ranger Corps and an equipment maintenance program assessment with recommendations. An invited guest from the Florida Keys NM Sanctuary Enforcement team participated in the training exchange between several enforcement disciplines.

### **Final Stage Description:**

The final stage included the following two components:

- 1) Production of an updated out-of-the-water photo series of regulated fish and invertebrates. The purpose was to produce a photo series that would be closer representations of the fish inspected dockside, at fish markets, and on fishers' boats.
- 2) Coral and fish identification intensive training for 40 DNER rangers. This training included classroom instruction as well as a performance measure in the form of an examination that led to a special training certificate. The course was implemented with a built-in performance measure in the form of a pre- and post- examination.

### **Results:**

By May 11, 2007, the 46- page color photo series was updated and finalized and 100 copies were printed. The book contained 79 color photos of fish and crabs that were out of the water. Photos included regulated species and similar species that may be confused with the regulated ones. Photos came from the Puerto Rico Department of Natural and Environmental Resources (DNER) files, from Fish Base, NOAA, and a few other personal sources from which permission was obtained. Rangers present in the May 2007 workshop received these updated copies as well as rangers who participated in two previous workshops sponsored by this project.



On May 15-16, 2007, a coral and fish identification intensive training was held at the DNER headquarters for 40 rangers from all regions of the island including Vieques and Culebra. See **Appendix A** for the full Agenda of the course taught by Dr. Edwin Hernández, Marine Ecologist from the University of Puerto Rico-Río Piedras. The workshop curriculum was based on the specific goal of developing basic visual criteria for the field identification of managed reef fish and coral species. This was accomplished by the following activities: 1) discussion of the principal morphologic and morphometric characteristics used in the

identification of managed reef fish and coral species; 2) discussion on how to use a dichotomous taxonomic key for the identification of corals; 3) visual identification of fish and coral taxonomic characteristics using a combination of power point presentations and printed material; and 4) providing pre-and post written examination on the identification of selected fish and coral species. This performance measure assessed existing knowledge and learning achieved in the workshop.



Aida Rosario, Director of DNER Fisheries Research, presented on Coral Law 147.

Myrna Abreu, Director of the Fishing and Hunting Division, presented on the Fisheries Regulation 6768 including the latest amendments approved in March 2007. Both presentations generated much discussion and many questions.



María del Mar Lopez, NOAA Fellow, and Kelvin Serrano, from the Marine Resources Division, presented on appropriate procedures for measuring different types of fish and invertebrates.





Many informal comments reflected the rangers' satisfaction for the guide that depicted species realistically out of the water. Each photo contains a description of the species characteristics, the regulations that apply, and how they differ from similar non-regulated species.

Post-test results demonstrated a significant difference in scores within the individual as well as within the group (See **Table 1** below and **APPENDIX B** for detailed pre- and post-test results). The average score in the pre-test was 65%. Ninety-nine percent of the participants improved greatly as demonstrated by the post-test where the average score was 91%. Informal comments reflected that the coral identification section was the most difficult.

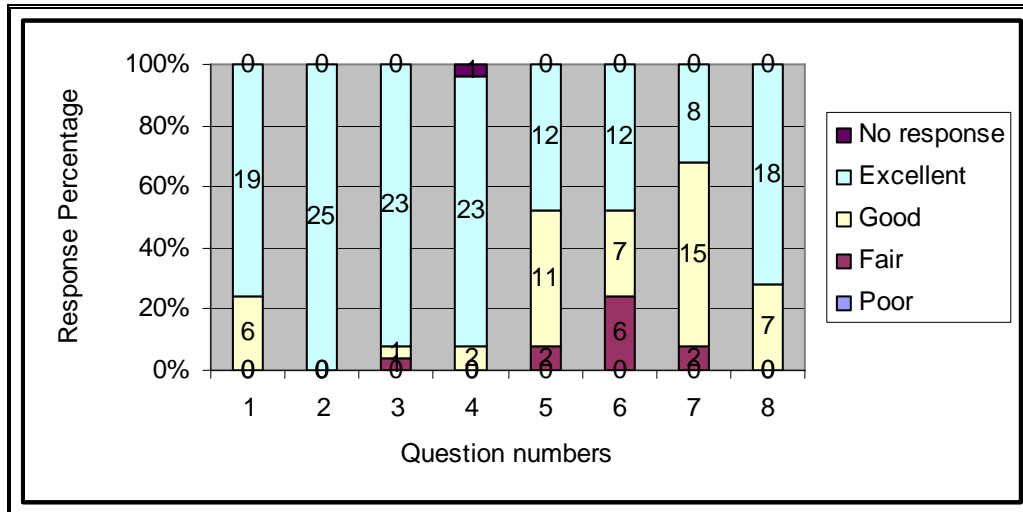
**Table 1**

	<b>Average Score</b>	<b>Average Improvement Percentage</b>
<b>Pre-test</b>	65%	---
<b>Post-test</b>	91%	26%

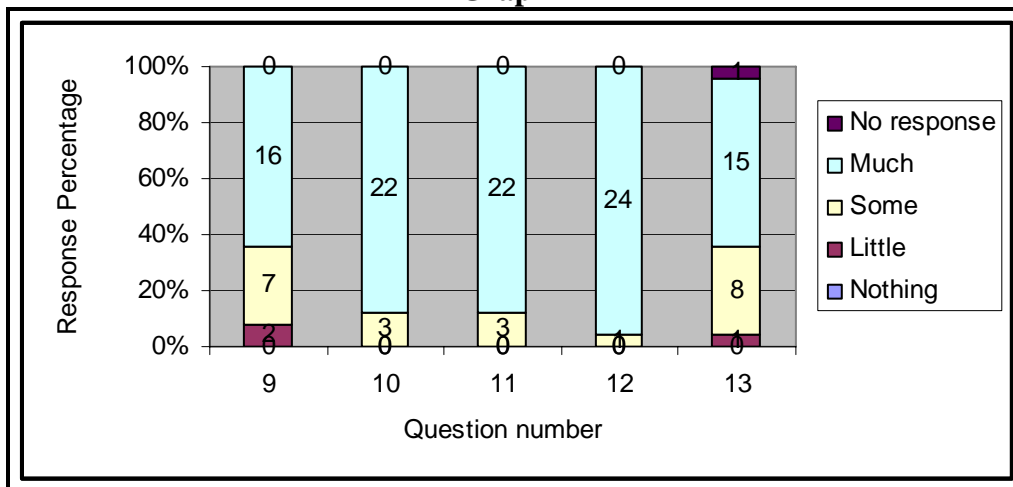
Twenty-five participants completed a course evaluation. See **Appendix C** for evaluation format. The rangers first rated general aspects about the course through the following eight questions: (Q.1) General organization; (Q.2) DNER facilities; (Q.3) Coral session; (Q.4) Fish/other invertebrate session; (Q.5) Coral Law session; (Q.6) Fisheries Regulations session; (Q.7) Q and A sessions; and (Q.8) Fish measurement session. As seen in **Graph 1** below, 76%-100% of rangers rated all these general items in the "Good and "Excellent" categories. A second set of questions addressed self-perception about their own learning. Questions 9 through 13 inquired about the approximate quantity of knowledge that the rangers gained in each of the following areas: (Q.9) Coral Identification; (Q.10) Fish identification; (Q.11) Other invertebrate identification; (Q.12) Fish measurement; and (Q.13) Coral Law and Fisheries Regulations. As seen in **Graph 2**, 60%-100% of rangers reported learning "Much" (the highest rating) in all areas of learning. The remainder 12% to 32% of rangers believed they learned "Some" in the areas of learning. A final questions not reflected in the graphs asked if they training was worse, the same, better or much better than previous trainings they have been provided. Seventy-two percent responded that this was a "much better" training.

The quantitative results of the course evaluation correlated very well with the participant comments. These were all positive or gave recommendations on what to add to the course. For a full record of the comments see **Appendix D**.

**Graph 1**



**Graph 2**



## Conclusion

This workshop fulfilled an important need in the Puerto Rico DNER Ranger Corps: capacity building in basic species identification to learn skills that Rangers can use on a daily basis as they carry out their responsibilities. Marine species recognition and identification is a priority concern for the Ranger Corps as most of them are not fishers. The out-of-the water species guide was also a very useful and realistic tool, according to the rangers' comments throughout the workshop. This guide allows the rangers to see the species as they appear on the dock, boats, fish houses, and restaurants. DNER staff is interested in institutionalizing this type of capacity building for the Ranger Corps and including upper command in future trainings on the Coral Reef Law and Fisheries Regulations.

The Ranger Corps Regulations were amended in May 2007 and one of its new stipulations is to identify training and human resources development needs that will serve as the basis for the Training and Capacity Building Plan. The Plan will be updated yearly and will include training means such as scholarships, seminars, short courses, leaves of absence, fellowships, and learning exchanges. It will take into consideration present and future training needs, short and long term DNER programmatic priorities, and precise identification of the issues to be resolved through training. DNER staff has expressed a need to extend capacity building training to upper command (sergeants, captains, and lieutenants). With a continued partnership from NOAA, DNER will be in a position to continue strengthening its enforcement capabilities and making significant strides in coral reef and fisheries protection.



Capt. Jeanette Solís participates in discussions

## APPENDIX A

### Taller para Vigilantes de Identificación de Especies Marinas Reglamentadas y de Corales Comunes

15 y 16 de mayo de 2007  
Departamento de Recursos Naturales y Ambientales  
Carretera Num. 838, Km.6.3 (Mapa al final)  
Auditorio, 4to Piso  
Sector el Cinco, Rio Piedras 00925  
787-999-2200

#### AGENDA FINAL

##### MARTES, 15 de mayo

- 9:00 a.m. Registro y desayuno
- 9:30 a.m. Bienvenida  
*Ernesto Díaz*, Administrador, DRNA  
*Col. Félix Salas*, Director Auxiliar, Cuerpo de Vigilantes, DRNA
- 9:40 a.m. Reglamento de Pesca  
*Myrna Abreu*, Directora de Caza y Pesca, DRNA
- 10:15 a.m. Ley de Corales. *Aida Rosario*, Directora, Investigación Pesquera, DRNA
- 10:45 a.m. Introducción, metas y objetivos del taller  
- Discusión de la organización, agenda y contenido de los materiales.  
Importancia de la identificación taxonómica para la aplicación de leyes-  
*Dr. Edwin Hernández*, Universidad de Puerto Rico
- 11:30 a.m. Pre-prueba de conocimiento de especies marinas reglamentadas.
- 12:00-1:00 p.m. ALMUERZO**
- 1:00 p.m. Introducción al uso de claves taxonómicas; con ejercicios prácticos de identificación taxonómica. *Edwin Hernández*.
- 1:15 p.m. Corales escleractínios – Especies principales; características diagnósticas; uso de laminas de identificación a prueba de agua; uso de claves dicótomas taxonómicas para la identificación de corales.
- 2:30 p.m. Descanso
- 2:45 p.m. Corales escleractínios (continuación) e Hidrocorales.

- 3:15 p.m. Octocorales – Especies principales; características diagnósticas; uso de laminas de identificación a prueba de agua; uso de claves dicótomas taxonómicas para la identificación de octocorales.
- 3:45 p.m. Repaso de las especies reglamentadas por el Reglamento 6768. Incluye pruebas informales para preparación para el examen final. Características diagnósticas para la identificación de las especies (imágenes digitales); uso de laminas de identificación a prueba de agua
- 4:30 p.m. Conclusión. *Eileen Alicea*

### **MIERCOLES, 16 de mayo**

- 9:00 a.m. Desayuno
- 9:30 a.m. Con't: Repaso de las especies reglamentadas por el Reglamento 6768. Incluye pruebas informales para preparación para el examen final. Características diagnósticas para la identificación de las especies (imágenes digitales); uso de láminas de identificación a prueba de agua
- 10:30 a.m. Ejercicio de medición de peces- *Kelvin Serrano y Maria del Mar López-DRNA*
- 11:30 a.m. Peces Ornamentales. Características diagnósticas para la identificación de las especies (imágenes digitales).
- 12:00 p.m. Almuerzo.**
- 1:00 p.m. Repaso de todas las especies de invertebrados y peces con pruebas informales.
- 2:00 p.m. Descanso
- 2:15 p.m. Examen Final para certificación.
- 3:00 p.m. Evaluación del curso, conclusión y entrega de certificados.

**Las siguientes Guías de identificación de peces y corales se les entregara a cada uno de los vigilantes presentes.**

- 1) Guia a prueba de agua de fotos en colores de peces y otros invertebrados fuera del agua**
- 2) Atlas de Corales de Cabo Rojo**



## APPENDIX B: Pre- and Post-test results

Ranger #	Pre-test	Post-Test	Difference in %
1	65%	96%	31
2	84%	97%	13
3	71%	83%	12
4	71%	90%	19
5	68%	90%	22
6	65%	97%	32
7	71%	100%	29
8	68%	87%	19
9	52%	77%	25
10	26%	80%	54
11	65%	83%	18
12	42%	63%	21
13	68%	93%	25
14	35%	67%	32
15	48%	100%	52
16	71%	97%	26
17	35%	80%	45
18	71%	93%	22
19	42%	Absent	
20	77%	100%	23
21	87%	100%	13
22	81%	90%	9
23	61%	100%	39
24	71%	100%	29
25	48%	90%	42
26	71%	93%	22
27	65%	100%	35
28	81%	97%	16
29	74%	100%	26
30	77%	100%	23
31	74%	93%	19
32	68%	90%	22
33	61%	80%	19
34	74%	83%	9
35	71%	100%	29
36	42%	80%	38
37	81%	100%	19
38	81%	80%	minus 1
39	81%	93%	12
40	65%	97%	32

## APPENDIX C

### EVALUACION DEL ADIESTRAMIENTO DE IDENTIFICACION DE ESPECIES MARINAS

15 y 16 de mayo 2007  
San Juan, Puerto Rico

Usando la escala del 1 al 4, por favor evalúe los siguientes componentes del adiestramiento  
(Circule el número escogido)

1) Organización general del curso

1-Pobre      2-Regular      3-Bueno      4-Excelente

Comentarios \_\_\_\_\_  
\_\_\_\_\_

2) Facilidades del DRNA

1-Pobre      2-Regular      3-Bueno      4-Excelente

Comentarios \_\_\_\_\_  
\_\_\_\_\_

3) Sesión de Corales

1-Pobre      2-Regular      3-Bueno      4-Excelente

Comentarios \_\_\_\_\_  
\_\_\_\_\_

4) Sesión de peces y otras especies marinas

1-Pobre      2-Regular      3-Bueno      4-Excelente

Comentarios \_\_\_\_\_  
\_\_\_\_\_

5) Sesión sobre la Ley de Corales

1-Pobre      2-Regular      3-Buenas      4-Excelente

Comentarios \_\_\_\_\_  
\_\_\_\_\_

6) Sesión sobre Reglamento de Pesca

1-Pobre      2-Regular      3-Buenas      4-Excelente

Comentarios \_\_\_\_\_  
\_\_\_\_\_

7) Las sesiones de preguntas y respuestas durante el taller fueron:

1-Pobre      2-Regular      3-Buenas      4-Excelente

Comentarios \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

8) La sesión sobre de medición de peces fue:  
1-Pobre      2-Regular      3-Buenas      4-Excelente  
Comentarios \_\_\_\_\_  
\_\_\_\_\_

Usando la siguiente escala, por favor conteste las preguntas 8-12

**Nada** = No aprendió nada nuevo

**Poco** = Aprendió algo pero no que le va a ayudar en el trabajo como vigilante

**Algo** = Aprendió algunas cosas que le van a ayudar a desempeñarse mejor como vigilante

**Mucho** = Aprendió muchas cosas que le van a ayudar a desempeñarse mejor como vigilante

9) ¿De acuerdo a sus expectativas, cuánto piensa que aprendió sobre como identificar los corales comunes:

Nada              Poco              Algo              Mucho

10) ¿De acuerdo a sus expectativas, cuánto piensa que aprendió sobre identificación de peces?

Nada              Poco              Algo              Mucho

11) ¿De acuerdo a sus expectativas, cuánto piensa que aprendió sobre los invertebrados (Langosta y cangrejos)?

Nada              Poco              Algo              Mucho

12) ¿De acuerdo a sus expectativas, cuánto piensa que aprendió sobre como medir peces?

Nada              Poco              Algo              Mucho

13) ¿De acuerdo a sus expectativas, cuánto piensa que aprendió sobre la Ley de Coral y el Reglamento de Pesca?

Nada              Poco              Algo              Mucho

**General:**

14) Comparado a otras experiencias de adiestramiento que ha tenido, esta fue:

Peor              Igual              Mejor              Mucho mejor

15) **Comentarios.** Por favor, escriba lo que haría diferentemente; o que otro tema se debe cubrir en otro adiestramiento futuro; o cualquier otro comentario.

**APPENDIX D**  
**Comments from Evaluations**

- ✓ I hope for other invitations, congratulations.
- ✓ I consider the Fisheries regulations very controversial and that they leave many unanswered questions.
- ✓ There should be live coral species for the ID exercise.
- ✓ We need more practice.
- ✓ We should have more trainings of this type.
- ✓ This training was genial. We should continue to have trainings in different topics.
- ✓ This was a very good training and I recommend frequent ones.
- ✓ Everything was good but I think we need more time for the common coral regulations.
- ✓ The regulations have many gaps.
- ✓ The materials handed out were very good because they help with our daily work.
- ✓ It is a lot of material for so little time and this affects the level of learning.
- ✓ Excellent. You should repeat the training at more depth.