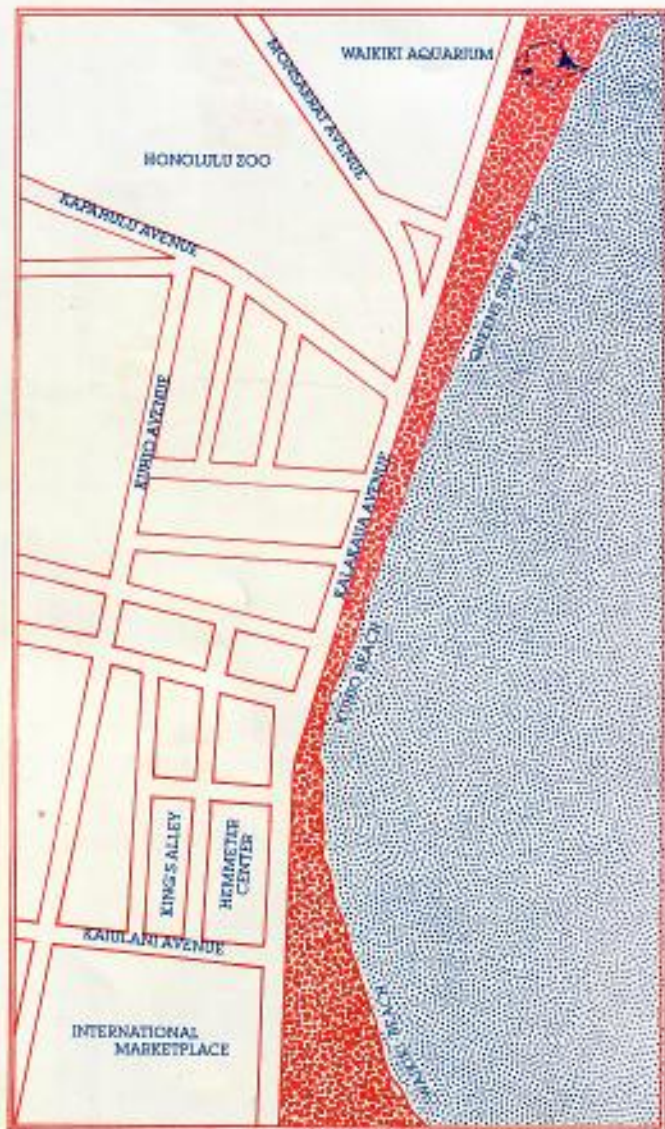


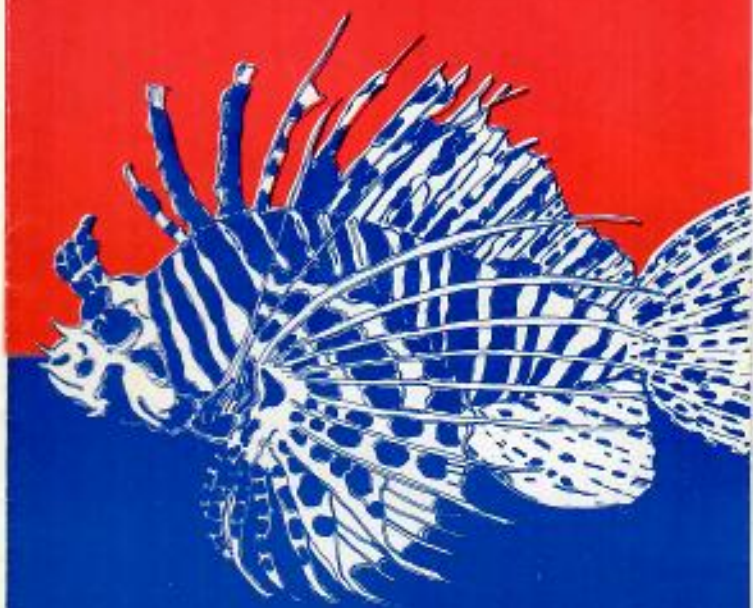
WAIKIKI AQUARIUM TURTLE DATA

1970s-1980s DATA,  
CORRESPONDENCE, & ARTICLES  
G.H. BALAZS FILE



AN ENJOYABLE WALK FROM WAIKIKI or take  
"The Bus" No. 2 Waikiki-Kapiolani Park.  
Call 531-1611 for Bus Information

# The Waikiki AQUARIUM





## WHAT IS AN AQUARIUM?

It's much more than a bowl of goldfish. It's rare chambered nautilus, charming seals, study tours to Micronesia, the excitement of a school child discovering a sea urchin; it's blacktip sharks and gold shell hermit crabs, volunteers, graduate students, research, and a bookshop. The Aquarium is enjoyable education about Hawaii's oceans.



The Waikiki Aquarium features more than 300 species of Hawaiian and South Pacific marine life in over 100,000 gallons of crystal clear Hawaiian seawater. As a part of the University of Hawaii, the Waikiki Aquarium is involved in research, and most of our exhibits are designed and maintained by researchers and students from the University.

# The Waikiki AQUARIUM Is For Land Animals



S I N C E 1 9 0 4

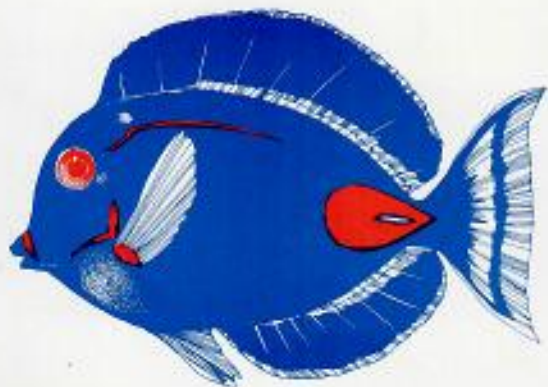
Since 1904 the Aquarium has been a landmark in Kapiolani Park in the shadow of Diamond Head. From the period when the park was a sleepy swamp served by a trolley car from downtown Honolulu, the Aquarium has grown to a major research facility and marine education center on the fringe of bustling Waikiki. The future holds a new and enlarged facility at another waterfront site in Honolulu. Planning is now underway for this world-class facility.





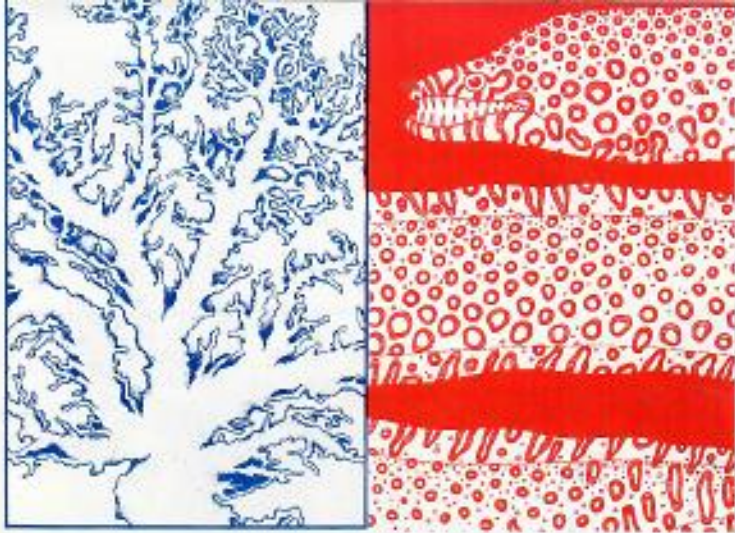
### THE NATURAL SELECTION SHOP

The Natural Selection Shop features marine-related books and gifts, and is a project of the Friends of the Waikiki Aquarium. All shop proceeds support our educational programs.



### BY WORD TOURS

Special self-guided audio tours are available in the bookshop using the unique By Word system. This wireless, gracefully portable device (about the size of a telephone receiver) will be your companion in the galleries. The Aquarium features the first bilingual By Word system with receivers available in English and Japanese.



### GUIDED TOURS

Guided tours are available by appointment. Our trained Docents represent a cross section of Hawaii's community and will be pleased to help your group of school children or club members with a special visit to the Aquarium. Call 923-4725.

### FRIENDS OF FISHES

We invite you to join the Friends of the Waikiki Aquarium. Annual membership donations from families, individuals, and students support our educational programs. You will receive our bi-monthly newsletter, a 10% discount in the bookshop and on most classes, and will be mailed notices of the many events at the Aquarium.

Volunteers are always welcome at the Aquarium. Learning opportunities include bookshop clerks, Aquarium helpers, and Docents our most important educational support.



Tagging and measurement of young hawksbills  
on display at the Waikiki Aquarium, 15 March 1980

by

G. H. Balazs  
Hawaii Institute of Marine Biology

---

| Old tag | New tag | Straight carapace length |
|---------|---------|--------------------------|
| 7001    | 6003    | 11.5 cm                  |
| 7003    | 6002    | 12.2                     |
| 7004    | 6001    | 12.8                     |
| 7005    | 6008    | 12.7                     |
| 7006    | 6006    | 15.9                     |
| 7007    | 6004    | 13.9                     |
| 7008    | 6005    | 16.4                     |
| 7009    | 6009    | 13.9                     |
| 7010    | 6007    | 16.1                     |
| 7011    | 6010    | 15.3                     |

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Green ink tattoo marks placed at two locations on each turtle.

*See p47  
Daily log*

## GROWTH RECORD FOR THE OLIVE RIDLEY IN CAPTIVITY AT THE WAIKIKI AQUARIUM

by G. H. Balazs

| Date     | Straight (cm) |       | Weight<br>(grams) | Plastron<br>(cm) | Head<br>(cm) |
|----------|---------------|-------|-------------------|------------------|--------------|
|          | Length        | Width |                   |                  |              |
| 11-29-81 | 22.0          | 20.1  | 1,520             | -                | -            |
| 2-4-82   | 22.5          | 20.4  | 1,760             | -                | -            |
| 4-8-82   | 22.9          | 20.9  | 1,880             | 18.6             | 5.2          |



Hawaiian green turtles sent to the Seattle Aquarium as hatchlings on  
4 September 1981 and returned to Honolulu on 1 February 1982

Compiled by G. H. Balazs

Tagged, measured, weighed, and photographed at the Waikiki Aquarium on  
4 February 1982 at 5 months of age:

| Tag No.           | Straight carapace |               | Weight<br>(g) |
|-------------------|-------------------|---------------|---------------|
|                   | Length<br>(cm)    | Width<br>(cm) |               |
| 5811*<br>(2-3d R) | 15.3              | 12.5          | 600           |
| 5812<br>(2-3d R)  | 15.1              | 12.7          | 560           |
| 5813<br>(2-3d R)  | 14.6              | 13.0          | 510           |
| 5814*<br>(2-3d R) | 13.9              | 11.6          | 460           |

\*Turtle 5811 has the least gray pigment in the plastron (nearly all white) and turtle 5814 has the most gray pigment. Turtle 5811 has the most pronounced brown/copper-colored areas in the centers of central scutes and scales on head; turtle 5814 has the least, being nearly all black.

J. NAUGHTON-

Released 2/7/82 at

20° 01.78'N ; 156° 58.76'W

April 20, 1981 data on captive-reared  
hawksbill at the Waikiki Aquarium

compiled by

George H. Balazs

Source: Paneawa Zoo, Island of Hawaii

Straight carapace measurements: 56.3 cm by 41.2 cm

Tags applied: 3519 LFL; 3520 RFL

Sex: probably female

Aquarium: shark display tank

Age:



GROWTH RECORD FOR THE OLIVE RIDLEY IN CAPTIVITY AT THE WAIKIKI AQUARIUM  
 Source- Stranded on south shore of Molokai in November of 1981  
 compiled by G. H. Balazs

| Date                             | Straight (cm) |       | Weight (grams)        | Plastron (cm) | Head (cm) |
|----------------------------------|---------------|-------|-----------------------|---------------|-----------|
|                                  | Length        | Width |                       |               |           |
| 11-29-81                         | 22.0          | 20.1  | 1,520                 | -             | -         |
| 2-4-82                           | 22.5          | 20.4  | 1,760                 | -             | -         |
| 4-8-82                           | 22.9          | 20.9  | 1,880                 | 18.6          | 5.2       |
| 9-21-82                          | 25.6          | 23.4  | 2,750                 | -             | -         |
| 1-21-83                          | 27.1          | 25.3  | 3,480                 |               |           |
| 6-25-83                          | 29.0          | 27.2  | (MOVED TO shark tank) |               |           |
| 1-13-84                          | 32.5          | 30.5  | 5,820                 | 25.7          | 7.2       |
| TAGGED 6049 1-2nd scale web left |               |       |                       |               |           |

Hana, MAUI Olive ridley 5-19-83


6-25-83 22.3 x 21.0

GREEN TURTLES RETURNED FROM CAPTIVE REARING AT THE SEATTLE AQUARIUM--

TAGGED AND MEASURED AT THE WAIKIKI AQUARIUM ON JUNE 25, 1983

by

G. H. Balazs

| Tag No.  | Straight carapace, cm |             | Comments   |
|--|-----------------------|-------------|--|
|  | Length                | Width       |  |
| 6-25-83 3686 R2-3  | 21.7                  | 18.4        | white <u>graft</u> spot 1-2nd lateral left; nothing ventral; |
|  9-21-82<br>3-7-84 | 8.3                   | -<br>TO FFS | 13.4 cm growth in 9 months = 1.49 cm/mo.                     |
| 3687 R2-3  | 22.6                  | 19.1        | fresh cuts on chin from shark;                               |
| 6-25-83 9-21-82  | 8.3                   | -           | 14.3 cm growth in 9 months = 1.59 cm/mo.                     |



MARINE TURTLE DATA COLLECTED  
 AT THE WAIKIKI AQUARIUM - DEC. 20, 1972

by G. H. Balazs

| No.    | Sex              | Species | Carapace<br>Straight Line, inches |              |
|--------|------------------|---------|-----------------------------------|--------------|
|        |                  |         | Length                            | Width        |
| 1      | M - 5-1/2" tail  | G       | 27-1/2                            | 23           |
| 28     | M - 10" tail     | G       | 31-1/2                            | 24-1/2       |
| 31     | F                | G       | 31-1/4                            | 24-7/8       |
| 34     | F                | G       | 29-1/4                            | 24-1/8       |
|        | M - 10-1/2" tail | G       | 34-1/2                            | 24-3/4       |
| 27     | F                | G       | 30-7/8                            | 25-1/4       |
| 8      | M(?) 3" tail     | G       | 25-1/2                            | 20-1/2       |
| 5      | missing          | G       | (4/74 - 17-1/2                    | 14-5/8)      |
| 3      | F - tumor        | H       | 27                                | 19-1/2       |
| 2      | F - deform       | H       |                                   | not measured |
| none   | ?                | H       | 21-5/8                            | 16-1/8       |
| none   |                  | C       |                                   | not measured |
| none   | - deform         | C       |                                   | not measured |
| none   | ? micro          | G       | 14-1/4                            | 11-3/4       |
| none 5 | ? micro          | G       | 17-1/4                            | 14-1/4       |
| none ? | F                | G       | 28-1/2                            | 23           |

| ANIMAL NO. | Weight, lbs. | Carapace Width, cms | Carapace Length, cms. | Head Width (ms. third plate) | Flipper length (ms. elbow to tip) | Tail Length cms |
|------------|--------------|---------------------|-----------------------|------------------------------|-----------------------------------|-----------------|
| 1 -        | 32.0         | 39.1                | 44.7                  | 7.1                          | 20.9                              | short           |
| 2-         | 23.5         | 35.4                | 41.8                  | 6.9                          | 24.1                              | short           |
| 3-         | 44.5         | 43.9                | 53.1                  | 8.3                          | 28.1                              | short           |

Number 1 left flipper markedly smaller than right. Number 2 displayed scar and injury on dorsal area of neck.

Photos taken - plastron shots in turtle number order-head shot of #3-one of holding tank.

J. Akiyama photos in 2-1-3 order.

All weighed 4-28-72 at National Marine Fisheries Service, Kewalo Basin, Honolulu. Removed from tank with scoop net. Animals reportedly fed white bait fish infrequently. In addition, dead fish from experiments are eaten by turtles.



DATA ON TAGGED GREEN SEA TURTLES

RELEASED BY THE WAIKIKI AQUARIUM

January 29, 1973

| Tag. No. | Shell Length * | Shell Width * | Weight ** | Apparent Sex |
|----------|----------------|---------------|-----------|--------------|
| 306      | 18-1/4         | 15.0          | 31-1/4    | F            |
| 308      | 26-3/4         | 21-3/4        | 117.0     | F            |
| 309      | 21-1/2         | 18-1/4        | 64-1/2    | F            |
| 310      | 26-1/4         | 21-1/2        | 111.0     | F            |
| 311      | 19-1/4         | 16-1/4        | 32-1/2    | F            |
| 312      | 26-1/2         | 20-1/4        | 95-1/2    | F            |
| 313      | 25.0           | 20-1/4        | 91-1/4    | F            |
| 314      | 21-3/4         | 18.0          | 60.0      | F            |
| 316      | 24-3/4         | 20-1/2        | 83.0      | F            |
| 317      | 24.0           | 21.0          | 94.0      | F            |

Data taken and tags supplied by the Hawaii Institute of Marine Biology,  
P. O. Box 1346; Kaneohe, Hawaii 96744.

\* measurement in inches

\*\* weight in pounds

Lehua IS

159 2.2.16  
3.59 4.0.1.0

DATA ON SEA TURTLES RELEASED FROM THE WAIKIKI AQUARIUM MARCH 24, 1973

| TAG NO. | APPARENT SEX | PLASTROM LENGTH | STRAIGHT |      | CURVED |      | THICKNESS | WEIGHT |        |     |     |
|---------|--------------|-----------------|----------|------|--------|------|-----------|--------|--------|-----|-----|
|         |              |                 | L        | W    | L      | W    |           |        |        |     |     |
| 1 73    | M            | 22 1/8          | 27 1/4   | 69.1 | 22 1/8 | 56.2 | 28 3/4    | 26 1/4 | 11 1/8 | 120 | 55  |
| 74A     | F            | 29 1/2          | 36       | 91.4 | 28 1/2 | 73.4 | 38 1/4    | 36 3/4 | 15     | 290 | 132 |
| 212A    | F            | 28 1/4          | 34 1/4   | 48.0 | 28 7/8 | 11.1 | 36 1/2    | 36 1/4 | 14 1/2 | 250 | 114 |
| 213A    | F            | 29 1/2          | 37       | 94.0 | 27 1/4 | 69.2 | 39        | 37     | 14 1/4 | 265 | 120 |
| 214     | M            | 22 1/2          | 27 1/2   | 69.9 | 21 3/4 | 55.2 | 28 3/4    | 26     | 10 1/2 | 120 | 55  |
| 215A    | M            | 27 1/2          | 34 1/2   | 87.6 | 26 3/4 | 67.9 | 26 1/2    | 33     | 12 3/4 | 210 | 95  |
| 216A    | F            | 29 3/4          | 38       | 96.5 | 39 3/4 | 75.6 | 40 1/4    | 38     | 15     | 325 | 148 |
| 217A    | M            | 31 1/2          | 37 3/4   | 95.9 | 29 1/4 | 74.3 | 39 3/4    | 37     | 14 3/4 | 326 | 148 |
| 218A    | F            | 29 3/4          | 36       | 91.4 | 26 1/4 | 66.7 | 38        | 33     | 15 1/2 | 285 | 130 |
| 219     | F            | 20              | 24       | 61.0 | 18 1/2 | 47.0 | 25 1/2    | 22 1/4 | 10 1/4 | 80  | 36  |
| 220     | F            | 20 3/4          | 29 1/2   | 74.9 | 23 5/8 | 4    | 31 1/4    | 26 3/4 | 11 3/4 | 150 | 68  |

1932  
1999

19156  
19182  
19182  
19182

T



DATA ON TAGGED GREEN SEA TURTLES

RELEASED BY THE WAIKIKI AQUARIUM

January 29, 1973

| Tag. No.                             | Shell Length * | Shell Width * | Weight **                      | Apparent Sex |
|--------------------------------------|----------------|---------------|--------------------------------|--------------|
| 306                                  | 18-1/4 46.4    | 15.0          | 38.1 31-1/4 14.2 <sup>kg</sup> | F            |
| JAN 23, 74<br>Havula, Oahu<br>308    | 26-3/4 67.9    | 21-3/4        | 55.2 117.0 53.2                | F            |
| 309                                  | 21-1/2 54.6    | 18-1/4        | 46.4 64-1/2 29.3               | F            |
| 310                                  | 26-1/4 66.7    | 21-1/2        | 59.6 111.0 50.5                | F            |
| 311                                  | 19-1/4 48.9    | 16-1/4        | 41.3 32-1/2 14.8               | F            |
| 312                                  | 26-1/2 67.3    | 20-1/4        | 51.4 95-1/2 43.4               | F            |
| 313                                  | 25.0 63.5      | 20-1/4        | 51.4 91-1/4 41.5               | F            |
| 314                                  | 21-3/4 55.2    | 18.0          | 45.7 60.0 27.3                 | F            |
| NOV 28, 73<br>Iolani Pt. Molo<br>316 | 24-3/4 62.9    | 20-1/2        | 52.1 83.0 37.7                 | F            |
| 317                                  | 24.0 61.0      | 21.0          | 53.3 94.0 42.7                 | F            |

Data taken and tags supplied by the Hawaii Institute of Marine Biology;  
P. O. Box 1346; Kaneohe, Hawaii 96744.

\* measurement in inches - straight

\*\* weight in pounds

DATA ON TAGGED GREEN SEA TURTLES

RELEASED BY THE WAIKIKI AQUARIUM

January 29, 1973

| Tag. No. | Shell Length * | Shell Width * | Weight ** | Apparent Sex |
|----------|----------------|---------------|-----------|--------------|
| 306      | 18-1/4         | 15.0          | 31-1/4    | F            |
| 308      | 26-3/4         | 21-3/4        | 117.0     | F            |
| 309      | 21-1/2         | 18-1/4        | 64-1/2    | F            |
| 310      | 26-1/4         | 21-1/2        | 111.0     | F            |
| 311      | 19-1/4         | 16-1/4        | 32-1/2    | F            |
| 312      | 26-1/2         | 20-1/4        | 95-1/2    | F            |
| 313      | 25.0           | 20-1/4        | 91-1/4    | F            |
| 314      | 21-3/4         | 18.0          | 60.0      | F            |
| 316      | 24-3/4         | 20-1/2        | 83.0      | F            |
| 317      | 24.0           | 21.0          | 94.0      | F            |

Received  
Wai. Ak.  
1/29/73

Data taken and tags supplied by the Hawaii Institute of Marine Biology;  
P. O. Box 1346; Kaneohe, Hawaii 96744.

\* measurement in inches

\*\* weight in pounds

3/20/74  
Charles DeLuca  
present

2 Hatchlings at Wikiki Aquarium  
Photos Taken

PAC RIDLEYS

from  
Philippines

OLIVE  
RIDLEYS

Animal #

|                | 1 | 2 | 4 | 5                    | 6 | 7                    | 8 | 9 |
|----------------|---|---|---|----------------------|---|----------------------|---|---|
| Centrals       |   |   |   | 7 (3rd; 4th divided) |   | 7 (3rd; 4th divided) |   |   |
| Laterals       |   |   |   | 7-6                  |   | 7-6                  |   |   |
| marginals      |   |   |   | 12-12                |   | 12-12                |   |   |
| prefrontals    |   |   |   | 4                    |   | 4                    |   |   |
| Inframarginals |   |   |   | 4                    |   | 4                    |   |   |
| Length         |   |   |   | 4.4                  |   | 4.1                  |   |   |
| width          |   |   |   | 3.7                  |   | 3.7                  |   |   |
| Appos wt.      |   |   |   | 14g                  |   | 14g                  |   |   |



Summary of marine turtle data  
 collected at the Waikiki Aquarium  
 March 25 - April 15, 1974

| Shell no. | Apparent sex-species | Carapace Straight line, inches, <small>cm</small> |              | Carapace curved, inches, <small>cm</small> |              |
|-----------|----------------------|---|--------------|--|--------------|
|           |                      | length  | width        | length                                     | width        |
| 1         | M-ch-5" tail         | 27 1/8 68.90                                      | 23 58.42     | 28 3/4 73.03                               | 28 71.12     |
| 28        | M-ch-adult tail      | 31 1/2 80.01                                      | 24 3/8 61.91 | 32 3/4 83.19                               | 29 1/4 74.29 |
| 31        | F-ch                 | 30 7/8 78.42                                      | 24 3/8 61.91 | 32 1/4 81.91                               | 30 1/8 76.52 |
| 34        | F-ch                 | 28 3/4 73.03                                      | 24 60.96     | 30 3/4 78.11                               | 29 73.66     |
| 3         | M-ch-adult tail      | 34 1/4 86.99                                      | 25 63.50     | 36 3/4 93.35                               | 31 1/4 79.37 |
| 27        | F-ch                 | 28 3/4 73.03                                      | 23 3/4 60.33 | 30 3/8 77.15                               | 29 1/4 74.29 |
| 8         | ?-ch                 | 23 3/4 60.33                                      | 19 1/4 48.89 | 25 1/4 64.13                               | 23 1/4 59.05 |
| 5         | ?-ch                 | 17 1/2 44.45                                      | 14 5/8 37.15 | 18 5/8 47.31                               | 17 3/4 45.09 |
| 3         | F-Er Tumor           | 26 1/8 66.36                                      | 18 1/2 46.99 | 25 3/4 65.41                               | 22 55.88     |
| 2         | F-Er deform          | 29 1/4 74.29                                      | 24 60.96     | 30 76.20                                   | 30 3/8 77.15 |
| none      | ?-Er                 | 18 7/8 47.94                                      | 14 1/8 33.88 | 18 3/8 46.67                               | 17 1/8 43.50 |
| none      | F-Car                | 33 3/4 85.73                                      | 27 1/8 68.90 | 34 1/8 86.68                               | 30 1/4 76.83 |
| none      | F-Car deform         | 32 1/2 82.55                                      | ---          | 36 3/4 93.35                               | ---          |

13 TOTAL

Summary of marine turtle data  
 collected at the Waikiki Aquarium  
 March 25 - April 15, 1974

| Shell no. | Apparent sex-species | Carapace straight line, inches |        | Carapace curved, inches |        |
|-----------|----------------------|--------------------------------|--------|-------------------------|--------|
|           |                      | length                         | width  | length                  | width  |
| 1         | M-ch-5" tail         | 27 1/8                         | 23     | 28 3/4                  | 28     |
| 28        | M-ch-adult tail      | 31 1/2                         | 24 3/8 | 32 3/4                  | 29 1/4 |
| 31        | F-ch                 | 30 7/8                         | 24 3/8 | 32 1/4                  | 30 1/8 |
| 34        | F-ch                 | 28 3/4                         | 24     | 30 3/4                  | 29     |
| 3         | M-ch-adult tail      | 34 1/4                         | 25     | 36 3/4                  | 31 1/4 |
| 27        | F-ch                 | 28 3/4                         | 23 3/4 | 30 3/8                  | 29 1/4 |
| 8         | ?-ch                 | 23 3/4                         | 19 1/4 | 25 1/4                  | 23 1/4 |
| 5         | ?-ch                 | 17 1/2                         | 14 5/8 | 18 5/8                  | 17 3/4 |
| 3         | F-Er Tumor           | 26 1/8                         | 18 1/2 | 25 3/4                  | 22     |
| 2         | F-Er deform          | 29 1/4                         | 24     | 30                      | 30 3/8 |
| none      | ?-Er                 | 18 7/8                         | 14 1/8 | 18 3/8                  | 17 1/8 |
| none      | F-Car                | 33 3/4                         | 27 1/8 | 34 1/8                  | 30 1/4 |
| none      | F-Car deform         | 32 1/2                         | ---    | 36 3/4                  | ---    |

No METAL TAGS -  
Nos Etched on CARAPACE

MARINE TURTLE DATA COLLECTED  
AT THE WAIKIKI AQUARIUM - DEC. 20, 1974

by G. H. Balazs

2 month growth data possible

1/27  
photo photo

1/22  
photo photo

| No.    | Sex                                       | Species | Carapace              |               |
|--------|---|---------|-----------------------|---------------|
|        |   |         | Straight Line, inches | Width         |
| 1      | M - 5-1/2" tail                           | G       | 27-1/2 69.86          | 23 58.42      |
| 28     | M - 10" tail                              | G       | 31-1/2 80.01          | 24-1/2 62.23  |
| 31     | F   | G       | 31-1/4 79.38          | 24-7/8 63.18  |
| 34     | F   | G       | 29-1/4 74.30          | 24-1/8 61.28  |
| 3      | M - 10-1/2" tail                          | G       | 34-1/2 89.63          | 24-3/4 62.87  |
| 27     | F   | G       | 30-7/8 78.42          | 25-1/4 64.14  |
| 8      | M(?) 3" tail                              | G       | 25-1/2 64.77          | 20-1/2 52.07  |
| 5      | missing                                   | G       | (4/74 - 17-1/2 44.45  | 14-5/8) 37.15 |
| 3      | F - tumor                                 | H       | 27 68.58              | 19-1/2 49.53  |
| 2      | F - deform                                | H       | not measured          |               |
| none   | ?   | H       | 21-5/8 54.93          | 16-1/8 40.96  |
| none   |   | C       | not measured          |               |
| none   | - deform                                  | C       | not measured          |               |
| none   | ? microbiology                            | G       | 14-1/4 36.20          | 11-3/4 29.85  |
| none 5 | ? microbiology                            | G       | 17-1/4 43.82          | 14-1/4 36.20  |
| none ? | F could this be 5 -<br>very rapid growth? | G       | 28-1/2 72.39          | 23 58.42      |

15 TOTAL

2 <sup>new</sup> micro additions since 4/74 measurement?



HISTORICAL RECORD FOR THE HAWKSBILL TURTLE IN CAPTIVITY AT THE  
 WAIKIKI AQUARIUM      Compiled by George H. Balazs

| Date     | Straight carapace   |       | Curved carapace            |                  | Weight               |
|----------|---|-------|----------------------------|------------------|----------------------|
|          | length  | width | length                     | width            |                      |
| 9-75     | Hatchling found at Cape Kumukahi on the Big Island;<br>Raised in captivity at the Paneawa Zoo |       |                            |                  |                      |
| 7-9-78   | Air shipped to the Waikiki Aquarium as per arrangements<br>by G. Balazs                       |       |                            |                  |                      |
| 9-11-78  |   |       | 16"<br>(40.1 cm)           | 14"<br>(35.6 cm) | 11-1/4lb<br>(5.1 kg) |
| 4-20-81  | 56.3  | 41.2  | Applied tags 3519 and 3520 |                  |                      |
| 1-82     | Sick- did not eat for approx. 2 weeks   |       |                            |                  |                      |
| 1-21-83  | 59.1  | 43.2  |                            |                  |                      |
| 12-15-83 | 62.3  | 44.9  | Released AT PUNALOU<br>KAU |                  |                      |

MARINE TURTLE DATA  
WAIKIKI AQUARIUM

February 2, 1976  
Collected by G. H. Balazs

| Tag Nos.                  | Straight Length<br>Width, in.   | Apparent Sex                    | Species | Comments                                  |
|---------------------------|---------------------------------|---------------------------------|---------|---|
| 924 RFL<br>206, 1751      | 27-1/2 x 23                     | <sup>approx</sup><br>M Released | green   | 6-3/4" tail                               |
| 204, 2006                 | 31-1/2 x 24-5/8                 | 150 M                           | green   | 10" tail                                  |
| 916 LF<br>207, 2008       | 31-3/8 x 25                     | 150 F                           | green   |   |
| 209, 1753                 | 29-1/8 x 24-1/4                 | F Released                      | green   |   |
| 205, 2007                 | 34-1/4 x 25-1/8                 | 220 M                           | green   | 10-1/2" tail                              |
| RFA<br>203, 2005          | 32-1/4 x 26-5/8                 | 170 F                           | green   |   |
| 920 LFL<br>208, 1752      | 26-1/2 x 21-1/2                 | M Released                      | green   | 5" tail                                   |
| 921 LFL<br>202, 1750      | 22-1/2 x 18-1/8<br>(57 cm x 46) | ? Released                      | green   | not fr. Hawaii(?)                         |
| 211, 1755                 | 23-1/8 x 16-7/8                 | 70 ?                            | hawk    |   |
| 917 LFL<br>918 RFL<br>214 | 30-1/8 x 24-1/3                 | F Released                      | hawk    | deformed carapace                         |
| 214                       | 27-3/4 x 19-1/2                 | 120 ?                           | hawk    | tumor right side<br>of head               |
| no tag                    | ---                             | 200 ?                           | logger  | deformed carapace                         |
| 215                       | 34-1/2 x 27-3/4                 | 220 F                           | logger  |   |
| 213, 1756                 | 19-1/8 x 16                     | 35 ?                            | green   | not from Hawaii                           |
| 210, 1754                 | 29-3/4 x 24-1/4                 | 135 F                           | green   |   |
| no tag                    | ---                             | ? ?                             | hawk    | fr. HIMB--seal bites                      |
| no tag                    | ---                             | ? ?                             | green   | not fr. Hawaii--<br>seal bites            |
| 201                       | 9-1/2 x 7-7/8                   | ? ?                             | green   | * from Rangiroa<br>(Subsequently drowned) |

Benedict-  
Hendrickson  
Sabah

fate unknown - to SCP?

fate unknown - to SCP?

6/1/76  
1300h all six released 1470 lbs  
in Hanalei Bay -  
underwater photos taken  
Leighton Taylor for KIMB-TV  
News

1 large ♀ not tags still on  
922 LFL  
923 RFL

Wm



6/4/76 Call from Cam McDonald  
Turtle 917 Hawk taken from under ledge  
in 45' off Lanai lookout 1200h -  
photo taken on rock shore and released.  
Dove - little resistance.  
copied slide in file



MARINE TURTLE DATA  
 WAIKIKI AQUARIUM

February 2, 1976  
 Collected by G. H. Balazs

*compiled*

| Tag Nos. | Straight Length<br>Width, in. | Apparent Sex | Species | Comments                       |
|----------|-------------------------------|--------------|---------|--------------------------------|
| 206,1751 | 27-1/2 x 23                   | M            | green   | 6-3/4" tail                    |
| 204,2006 | 31-1/2 x 24-5/8               | M            | green   | 10" tail                       |
| 207,2008 | 31-3/8 x 25                   | F            | green   |                                |
| 209,1753 | 29-1/8 x 24-1/4               | F            | green   |                                |
| 205,2007 | 34-1/4 x 25-1/8               | M            | green   | 10-1/2" tail                   |
| 203,2005 | 32-1/4 x 26-5/8               | F            | green   |                                |
| 208,1752 | 26-1/2 x 21-1/2               | M            | green   | 5" tail                        |
| 202,1750 | 22-1/2 x 18-1/8               | ?            | green   | not fr. Hawaii(?)              |
| 211,1755 | 23-1/8 x 16-7/8               | ?            | hawk    |                                |
| 212      | 30-1/8 x 24-1/8               | F            | hawk    | deformed carapace              |
| 214      | 27-3/4 x 19-1/2               | ?            | hawk    | tumor right side<br>of head    |
| no tag   | ---                           | ?            | logger  | deformed carapace              |
| 215      | 34-1/2 x 27-3/4               | F            | logger  |                                |
| 213,1756 | 19-1/8 x 16                   | ?            | green   | not from Hawaii                |
| 210,1754 | 29-3/4 x 24-1/4               | F            | green   |                                |
| no tag   | ---                           | ?            | hawk    | fr. HIMB--seal bites           |
| no tag   | ---                           | ?            | green   | not fr. Hawaii--<br>seal bites |
| 201      | 9-1/2 x 7-7/8                 | ?            | green   | from Rangiroa                  |



DEPARTMENT OF THE INTERIOR  
U.S. FISH AND WILDLIFE SERVICE

Lloyd 500 Bldg., Suite 1490; 500 NE Multnomah St.  
Portland, OR 97232

**FEDERAL FISH AND WILDLIFE PERMIT**

8-201  
(2/76)

1. PERMITTEE

WAIKIKI AQUARIUM  
2777 Kalakaua Avenue  
Honolulu, Hawaii 96815

2. AUTHORITY - STATUTES

Endangered Species Act

REGULATIONS (Attached)

50 CFR 13 and 17

3. NUMBER

PRT 2-1398-PT

4. RENEWABLE

YES

NO

5. MAY COPY

YES

NO

6. EFFECTIVE

2/15/79

7. EXPIRES

until  
revoked

8. NAME AND TITLE OF PRINCIPAL OFFICER (If #1 is a business)

Dr. Leighton Taylor

9. TYPE OF PERMIT

ENDANGERED SPECIES LOAN AGREEMENT

10. LOCATION WHERE AUTHORIZED ACTIVITY MAY BE CONDUCTED

----- Waikiki Aquarium, Honolulu, Hawaii -----

11. CONDITIONS AND AUTHORIZATIONS:

A. GENERAL CONDITIONS SET OUT IN SUBPART D OF 50 CFR 13, AND SPECIFIC CONDITIONS CONTAINED IN FEDERAL REGULATIONS CITED IN BLOCK #2 ABOVE, ARE HEREBY MADE A PART OF THIS PERMIT. ALL ACTIVITIES AUTHORIZED HEREIN MUST BE CARRIED OUT IN ACCORD WITH AND FOR THE PURPOSES DESCRIBED IN THE APPLICATION SUBMITTED. CONTINUED VALIDITY, OR RENEWAL, OF THIS PERMIT IS SUBJECT TO COMPLETE AND TIMELY COMPLIANCE WITH ALL APPLICABLE CONDITIONS, INCLUDING THE FILING OF ALL REQUIRED INFORMATION AND REPORTS.

B. THE VALIDITY OF THIS PERMIT IS ALSO CONDITIONED UPON STRICT OBSERVANCE OF ALL APPLICABLE FOREIGN, STATE, LOCAL OR OTHER FEDERAL LAW.

C. VALID FOR USE BY PERMITTEE NAMED ABOVE. Only.

D. Authorized to possess one (1) hawksbill turtle (live) for exhibition purposes. This document, when signed by both parties, constitutes a loan agreement between the named permittee and the Fish and Wildlife Service as follows: The turtle covered by this agreement is on loan from the Fish and Wildlife Service for educational purposes. Display of this item(s) shall be accompanied by a sign indicating possession and exhibition by permission of the U. S. Fish and Wildlife Service.

E. Retain this agreement with the records of your institution and display it upon request by any Agent of the Service.

F. The turtle covered by this agreement remains in the stewardship of the U. S. Government, and may be recalled if needed. It must not be disposed of in any manner without prior consent of the Service.

ADDITIONAL CONDITIONS AND AUTHORIZATIONS ON REVERSE ALSO APPLY

12. REPORTING REQUIREMENTS

Promptly report any loss or damage to the office issuing this permit.

Accepted by: \_\_\_\_\_  
For: The Waikiki Aquarium

ISSUED BY

*Lawrence C. Wills*

TITLE

Special Agent in Charge  
Law Enforcement District #2

DATE

February 15, 1979

ORIGINAL Lawrence C. Wills

cc: SRA/Honolulu HI F&G HI Administrator

Green Turtles Released from the Waikiki Aquarium

October 13, 1977 - Queen's Surf

compiled by G. H. Balazs

| <u>Tag Nos.</u>        | <u>Carapace measurements</u> |                 | <u>Sex</u> |
|------------------------|------------------------------|-----------------|------------|
|                        | straight                     | curved          |            |
| 2008, 2406, 2407, 2408 | 32 x 25 1/4                  | 33 1/2 x 30 3/4 | F          |
| 2409, 2410, 2411       | 34 3/8 x 25 1/4              | 36 x 33 3/4     | M          |



Hawksbill hatchlings\* tagged and measured  
at the Waikiki Aquarium - 30 November 1978

by

G. H. Balazs  
Hawaii Institute of Marine Biology

---

| Tag No.** | Straight carapace<br>length |
|-----------|-----------------------------|
| 7001      | 60                          |
| 7002      | 56                          |
| 7003      | 50                          |
| 7004      | 53                          |
| 7005      | 55                          |
| 7006      | 62                          |
| 7007      | 58                          |
| 7008      | 61                          |
| 7009      | 56                          |
| 7010      | 64                          |
| 7011      | 58                          |

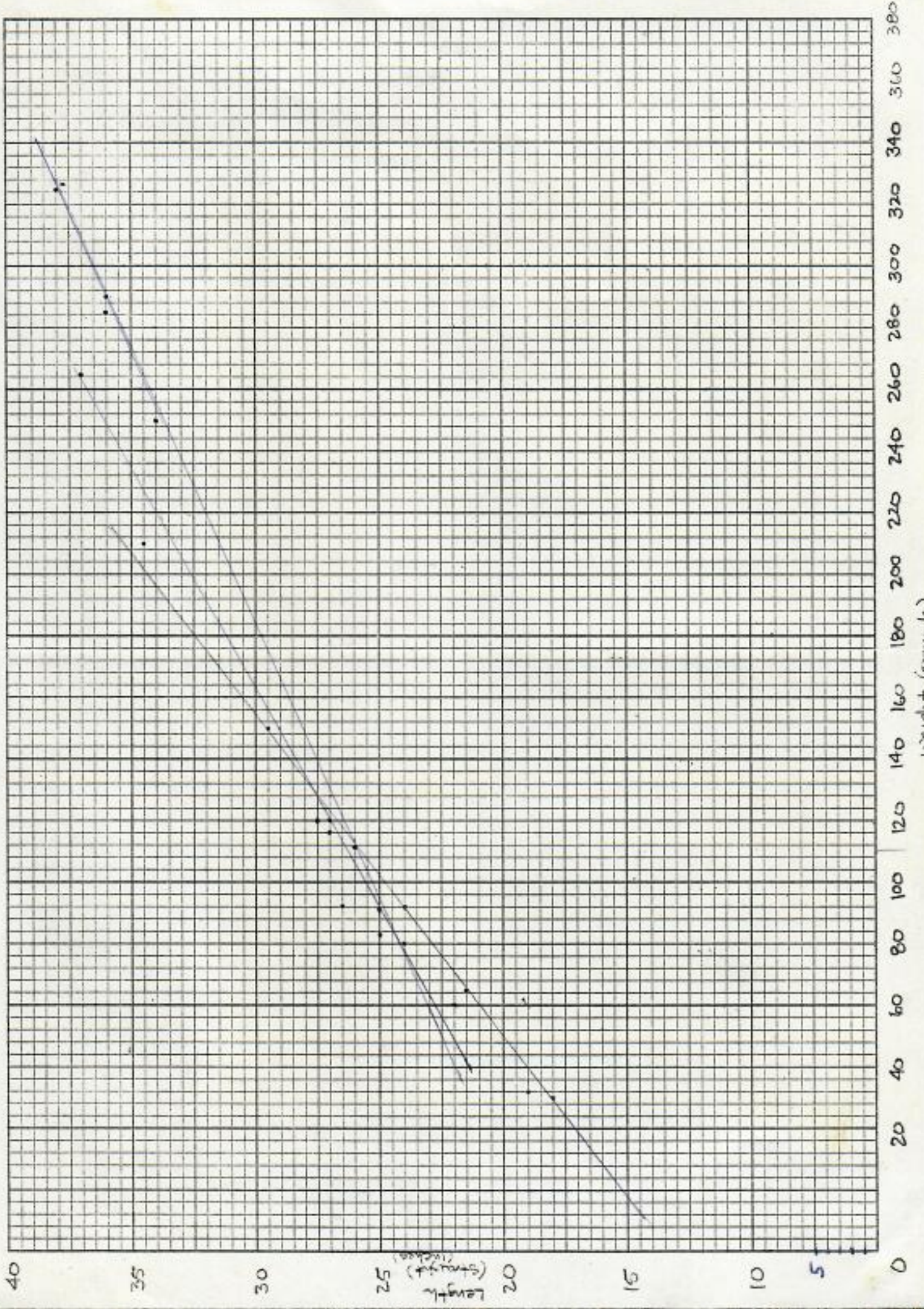
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\*Source unknown

\*\*1005 Monel Size 1 manufactured by National Band and Tag Company, Newport, Kentucky,  
and inscribed with - HAW.

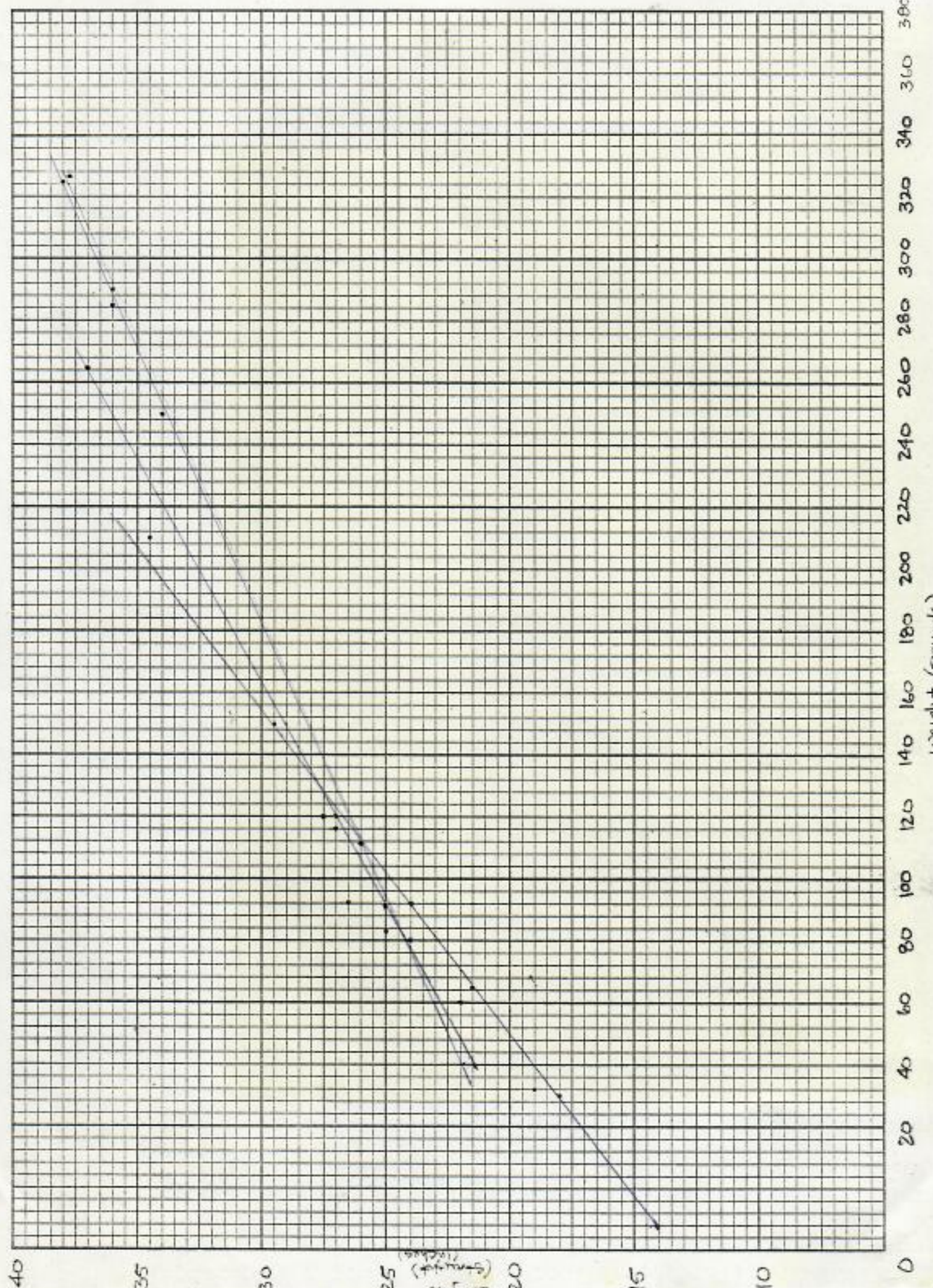


Straight Carapace Length vs Weight for Turtles Released from Waikiki Aquarium



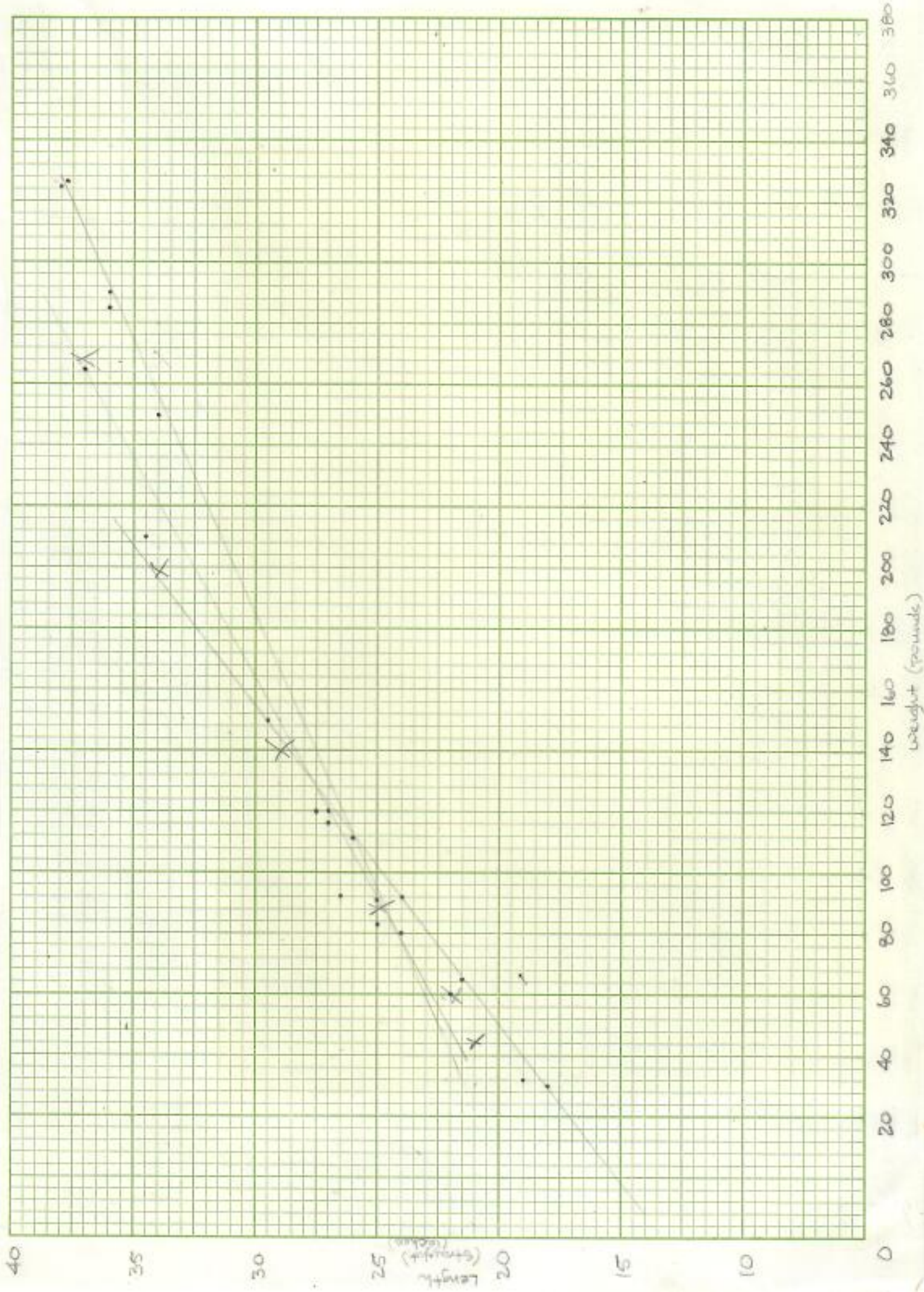


Straight Carapace Length vs Weight for Turtles Released from Waikiki Aquarium





Y = 5.66 x 10<sup>-3</sup> wt<sup>3</sup>  
Straight Carapace Length vs Weight for Turtles Released from Waikiki Aquarium.







National Museum of Natural History · Smithsonian Institution

WASHINGTON, D.C. 20560 · TEL. 202-

FTS- 357 + 300  
2778  
Called 2-2-84

January 18, 1984

Dr. G. Balazs  
National Marine Fisheries Service  
F/SWC2  
P. O. Box 3830  
Honolulu, Hawaii 96812

Dear Dr. Balazs:

Within a week or two we will start preparation of the Dermochelys sclerotic ossicles. If it is convenient, please send the Chelonia bone. Once we are set up for bone histology, it seems most efficient to continue such preparation.

For my initial examination, I would prefer that you send only an identifying number with one. I would prefer to make the original estimates of age as bias free as possible.

Thanks,

Cordially,

*George*  
George R. Zug, Curator  
Division of Amphibians & Reptiles

P.S. I know of no records close to 27 years for a sea turtle in captivity  
Bowler (Longevity of Reptiles..., 1977, SSAR Herpetol. Circ. #6)  
lists a Lepidochelys Kempfi record of 3½ yrs.

Search - Locker  
Attic  
HIMB

Lock at his MNA article -

Juvenile - 5630 (Canikai speared)  
Adult - Cisianski  
Adult - Kaneohe Bay  
Adult - Laysan  
Juvenile - Bellows  
Juvenile - Kau  
Juvenile - Midway

Captive reared HIMB -  
recent  
Kewalo - Kahaluu mortality

Aquarium



U.S. DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
NATIONAL MARINE FISHERIES SERVICE  
Southwest Fisheries Center  
Honolulu Laboratory  
P. O. Box 3830  
Honolulu, Hawaii 96812

January 26, 1982

F/SWC2:GHB

Sea Turtle Stranding Report

- Date of stranding - November 28, 1981
- Location - Puko'o, island of Molokai, State of Hawaii  
(approximately 21°06' N, 156°48' W)
- Species - Lepidochelys olivacea (olive ridley)
- Lateral scute counts - 5-5
- Straight line measurements - Carapace length 22.0 cm, carapace width 20.1 cm;  
plastron length 17.6 cm
- Weight - 1.52 kg
- Circumstances of stranding - Turtle was found entangled in plastic line and washed up on shore
- Condition of turtle - Cuts present in proximal areas of three flippers resulting from entanglement in line; moderate emaciation apparent from appearance of plastron and limb muscles. Numerous photographs taken. Turtle was transferred to the Waikiki Aquarium (University of Hawaii) where it is undergoing successful recuperation.
- Persons that found the turtle - Clayton Afelin and Bill Puuloa
- Person submitting this report to SEAN - George H. Balazs  
NMFS, Honolulu Laboratory  
P. O. Box 3830  
Honolulu, Hawaii 96812



KILO i'a JAN/FEB 86

Short Takes

WAIKIKI AQUARIUM

NO. 54

On October 27, 1985 the Aquarium was asked by U.S. Customs authorities to provide temporary housing for a recently hatched hawksbill turtle, *Eretmochelys imbricata*, an endangered species. Customs authorities had confiscated the young animal while it was being transported illegally from the Philippines.

The Honolulu Laboratory of the National Marine Fisheries Service was consulted about the two and a half inch stray and it was decided not to release the turtle into Hawaiian waters since it might belong to a subspecies not represented in Hawaii.

The Waikiki Aquarium was selected to provide a home for the infant turtle and it will remain in tank 10 for the foreseeable future. It will be instructive as well as interesting to watch this newcomer grow towards maturity.

Drop in regularly to check the turtle's progress!



# ⚠ Aquarium advisory: Beware of sea snake — venom is deadly

Watch out for yellow-bellied sea snakes. They are deadly poisonous, and under no circumstances should anyone try to handle one.

No, they are not swarming around the Islands, but the Waikiki Aquarium has seen five in Hawaiian waters in two years, and while that isn't epidemic, in the six years prior to that, only one was reported to the aquarium.

So aquarium officials have sent out an advisory, especially to people who fish. You should know how to recognize the snake, and steer clear of it.

The yellow-bellied sea snake, according to the aquarium, carries enough venom in a single drop to kill three people.

It is jet black on its back and, as its name suggests, has a bright yellow underside. The tail has a reticulated yellow and black pattern.

Sometimes sea snakes are confused with eels, but there are distinct differences.

Like all true snakes, this one has lungs and must come to the surface to breathe; eels rarely ascend to the surface. It also has scales, while eels are smooth.

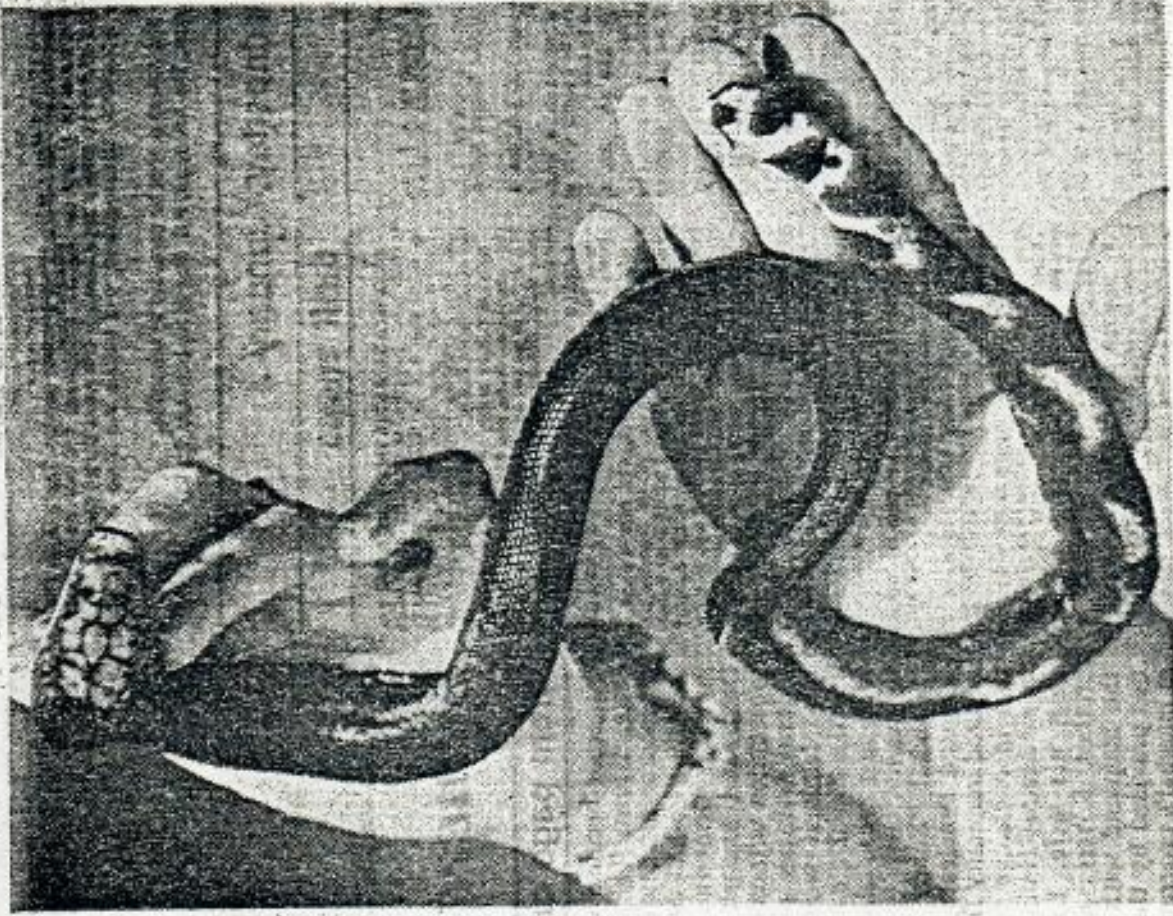
While it is deadly, the yellow-bellied sea snake is not very aggressive, and there are few recorded instances of one biting a human. When they do bite, they don't always inject venom.

Bathers are less likely to encounter this sea snake, since the snake tends to stay far out at sea, but people who fish from boats might see one, especially at night, the aquarium warns.

These snakes are very common along the coastline of Central America, but how these few have made it to Hawaii waters is a mystery. It is not known if a breeding population has been established in the Islands.

1-4-84 HA  
This dead yellow-bellied sea snake was found last month near Hilo.

Waikiki Aquarium photo by Bruce Carlson





4/13/83

Dear George -

Leighton passed along this information about the special exhibit on endangered species at Shedd Aquarium. I've made copies for the Education Section. We all (Leighton, Education + graphics sections) feel that there is potential here for a special Aquarium exhibit or lecture. We'll be in touch with you about it, but just when, I cannot say. Mary + I are still trying to finish layouts for the big exhibit!

I've also enclosed copies (probably identical to letters you received) of letters I received from Hettel + Matsunaga re: green turtle products.

Many thanks for sharing your information and good ideas with us!

Carol Hopper





# NEWS from SHEDD AQUARIUM

1200 South Lake Shore Drive, Chicago, Illinois 60605

FOR INFORMATION CALL:  
Becky Barefoot 939-2426, Ext. 361

## FACT SHEET

EXHIBITION TITLE: RARE CARGO, DESTINATION: EXTINCTION

MAR 14 '83 AM

DATES: March 15 through May 15



REC'D H.I.M.B.

LOCATION: John G. Shedd Aquarium  
1200 South Lake Shore Drive  
Chicago, Illinois 60605

SPONSORED BY: Cleveland Museum of Natural History

DESCRIPTION: RARE CARGO is an exhibit that examines the plight of the world's vanishing wildlife, highlighting, in particular, the illegal traffic in animal products and its effect on endangered populations of sea turtles, marine mammals, wild cats and other species. The exhibit contains articles made from the furs, hides, feathers, teeth and flesh of creatures threatened with extinction, all of which were confiscated by the U.S. Fish and Wildlife Service.

SPECIAL PROGRAMS: Five education programs will be offered free to the public on the Sundays listed below:

March 21: Dolphin Behavior  
April 10: Snakes  
April 17: Confiscated: A Look at Imports and Exports Through the Port of Chicago  
May 1: Sea Turtles  
May 15: Wild Cats

Free films on endangered species will be shown weekends in the Aquatic Science Center.

AQUARIUM HOURS: March 15 to April 30: daily 10 AM to 5 PM  
May 1 to May 15: daily 9 AM to 5 PM

ADMISSION: The exhibit is free with Aquarium admission - \$2 adults; \$1 children ages 6-17; \$.50 senior citizens; and \$4 families. Thursdays are free to all.

###



# NEWS from SHEDD AQUARIUM

1200 South Lake Shore Drive, Chicago, Illinois 60605

FOR IMMEDIATE RELEASE.

FOR INFORMATION CALL:  
Becky Barefoot 939-2426, Ext. 361

## SHEDD AQUARIUM EXHIBIT FOCUSES ON ILLEGAL TRAFFIC IN WILDLIFE

The plight of the world's vanishing wildlife is the subject of an exhibit March 15 through May 15 at the John G. Shedd Aquarium.

RARE CARGO, DESTINATION: EXTINCTION highlights the illegal traffic in animal products and its effect on endangered populations of sea turtles, marine mammals, wild cats and other species.

The exhibit, sponsored by the Cleveland Museum of Natural History, contains articles made from the furs, hides, feathers, teeth and flesh of creatures threatened with extinction. All of the articles were confiscated by the U.S. Fish and Wildlife Service as they were brought into this country in violation of federal laws or international treaties protecting wildlife.

Assembled for display are such exotic items as elephant hair bracelets, sea turtle shell rings, seal skin slippers, ivory statues, python belts, zebra skins, rhino horn "medicinal" tablets and whale bones and teeth.

Officials estimate that the illegal trade in wildlife amounts to more than \$100 million in the U.S. alone, and is more profitable for the trader than traffic in illegal drugs. RARE CARGO examines

(more)



ADD ONE  
AQUARIUM EXHIBIT

the pressures that this trade as well as poaching and loss of habitat have placed on a variety of species, reducing their numbers severely and putting many on the brink of extinction.

The exhibit outlines the laws and treaties regulating or prohibiting importation and exportation of certain animals or products made from those animals, including the Marine Mammal Act and the Endangered Species Act.

It also addresses the importance of wild animals and explains what individuals can do to help preserve them.

Special educational programs will be offered on five Sundays in conjunction with the RARE CARGO exhibit. Each is free with Aquarium admission and will be repeated several times on the dates scheduled.

March 20: Dolphin Behavior, Randall Brill, Brookfield Zoo

April 10: Snakes, Chicago Herpetological Society

April 17: Confiscated: A Look at Imports and Exports Through the Port of Chicago, Robert Kavetsky, U.S. Fish and Wildlife Service

May 1: Sea Turtles, Sue Kenney, Shedd Aquarium

May 15: Wild Cats, Mark Rosenthal, Lincoln Park Zoo

Also, free films on endangered species will be shown hourly on weekends during the two-month run of the RARE CARGO exhibit.

For more information on the exhibit, special educational programs or free weekend films call 312/939-2426, extension 388.

###



Ron D. Barbaro  
Chairman  
Dr. Peter Crowcroft  
General Director

31 March 1983

Mr. George H. Balazs  
Assistant Marine Biologist  
Hawaii Institute of Marine Biology  
P.O. Box 1346  
Coconut Island  
Kaneohe, Hawaii 96744

Dear Mr. Balazs:

In answer to your earlier letter to the Calgary Zoo, acknowledged by Greg Tarry and forwarded on to me, I am enclosing copies of old newspaper clippings from my files which might confuse more than enlighten you.

I was Curator of the now defunct Calgary Aquarium from its inception in 1960 to 1967. Through Dr. Murray Newman's contact with Spencer Tinker we were able to acquire some green sea turtles for our opening on August 25th, 1960, with subsequent specimens arriving thereafter. The clippings explain this pretty well.

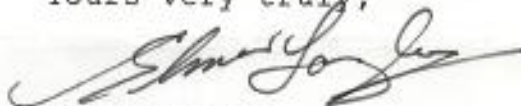
If I remember correctly and as stated in the clipping, the first turtle to arrive was a single specimen, with others following after the systems were established. As evidenced by the picture of the mermaid, there were at least two turtles at Christmas 1960, and others followed in 1961. Unfortunately, just prior to Christmas 1961 the heating to the sea turtle tank malfunctioned and all turtles succumbed to excessive heat. New turtles were subsequently acquired from the Wakiki Aquarium and the Miami Seaquarium and these were still at the Calgary Aquarium when I departed in 1967. I believe that when the Aquarium closed in 1972 most of the marine animals were shipped to the Quebec Aquarium, Quebec City, P.Q. here in Canada. Not being there at the time, I am not sure if this is correct, but I have written to the person who used to care for fishes, etc., who now lives in British Columbia, to see if he can shed any light on the subject. Hopefully, he may recall what turtles were there at closing and where they were sent. I believe that the deceased turtles of Dec. '61 were turned over to the University of Alberta, Zoology Dept., in Edmonton.



I'm sorry I do not have any more information for you at this time; however, I expect that my contact in B.C. may be able to provide some additional details which I will pass along to you should they be pertinent to your enquiry.

Trusting the enclosed is of some assistance,

Yours very truly,

A handwritten signature in cursive script, appearing to read 'Elmer Taylor', written in dark ink.

Elmer Taylor  
Curator of Fishes  
Metro Toronto Zoo

ET/lm  
encls.



**AQUARIUM SPECIMENS.** A 150-pound sea turtle was added to the Calgary Brewing and Malting Co. Ltd. aquarium on Friday. It is shown after the flight with TCA stewardess Glenda McKenzie, (left), and registration clerk Irene Gouldie.

## 'Upside-Down' Turtle Righted In Aquarium

Two three-foot alligators and a 150-pound sea turtle are the latest additions to the Calgary Brewing and Malting Co. Ltd. aquarium. They arrived in Calgary by air on Friday.

The new aquarium, built at a cost of approximately \$450,000, will open its doors to the public toward the end of this month.

The aquarium's turtle made the air flight from Vancouver to Calgary, on its back, because the shell on sea turtles is so heavy out of water that its weight will rupture the reptile's lung.

Specimens now at the aquarium include the turtle, the alligators, crabs and flounders. Some tropical fish are due to

arrive in the city Monday or Tuesday.

### TROPICAL PLANTS

A consignment of tropical plants, necessary for the tropical fish tanks, arrived at the aquarium last week and approximately 7,000 of a 50,000-gallon shipment of sea water needed for ocean fish has arrived from the West Coast.

The sea water is being shipped from Vancouver to Calgary by truck—in polyethylene bags holding 1,500 gallons.

Cost of transporting the 50,000 gallons of sea water from the west coast has been estimated at between \$7,500 and \$8,000.

When fully developed the aquarium will display nearly 2,000 specimens and the building includes a reptile pit and a second-floor museum.

One wall of the aquarium—75 feet long—has been reserved for a display of exotic fish. Other tanks, ranging in capacity from 1,000 to 7,000 gallons, will display fish native to Western Canada and salt water fish from the West Coast.

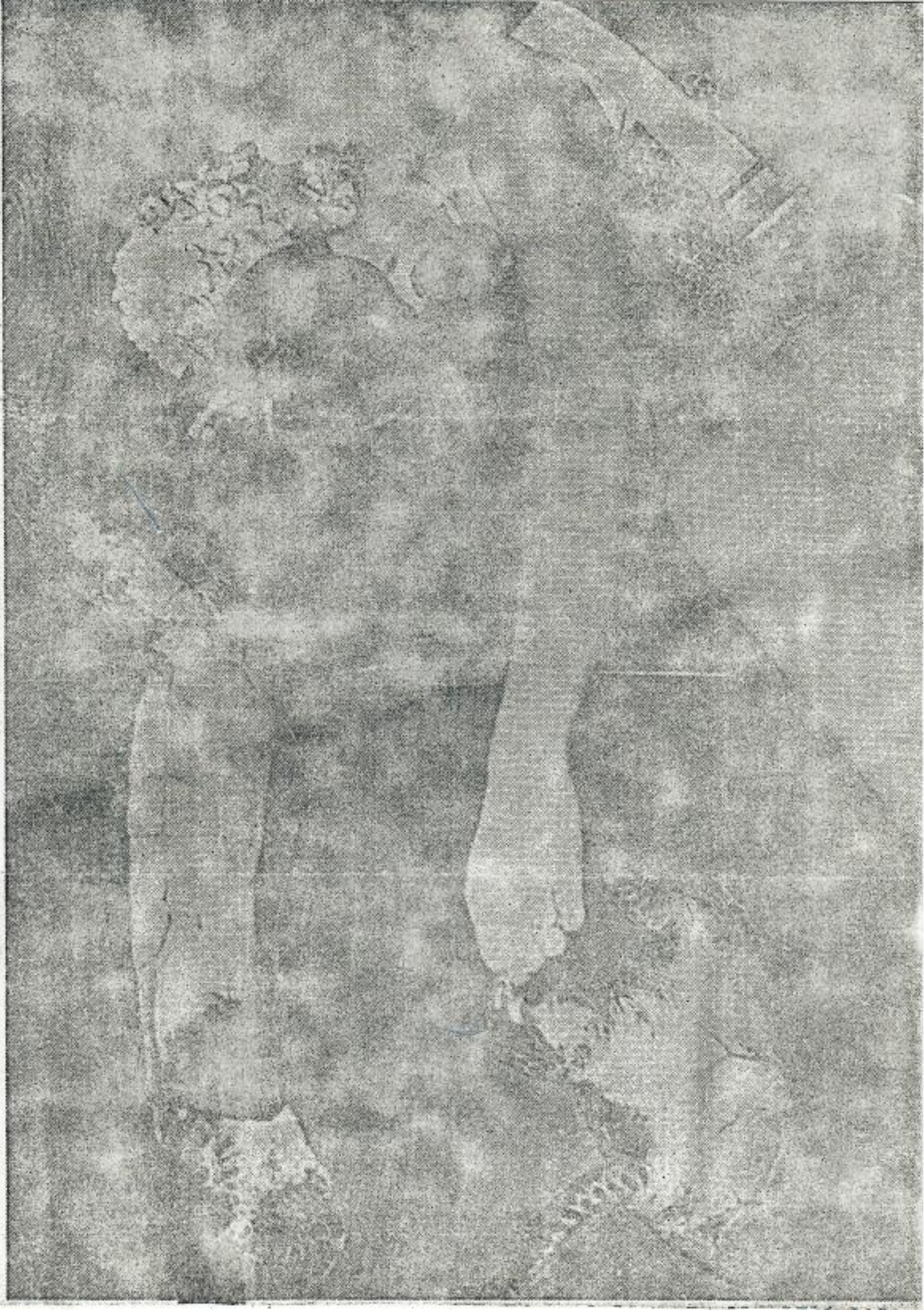
The new aquarium, under the direction of aquarist Elmer Taylor, will supplement the outdoor fish pools and fish hatcheries now operated by the company.

*The Calgary Herald 6 Aug 60*

*Green  
250 lbs*



Calgary Herald 29 Dec. 60







**TURTLE TALK.** Dr. Pauline Snieckus murmurs reassuring words to this sea turtle as he poses for his first picture upon arriving in Calgary from the Waikiki Aquarium in Honolulu. The veterinarian was giving four sea turtles flown from Hawaii to the Calgary Aquarium a routine physical examination. The aquarium here already has three sea turtles, but one will be sent to the Vancouver Aquarium.





**ENOUGH OF THIS TURTLE DOYING.** This Hawksbill turtle doesn't fancy the friendly pot E. H. Taylor, curator of the Calgary Aquarium, gives him as a welcome to the city. He would much rather get right to the water. Capt. William B. Gray, director of collections and exhibits at the Seaquarium in Miami, Fla., hands over the turtle, one of two presented to the Calgary Aquarium.

*Herald 17 June 1963*

## Sea Turtles Join Exhibits At Aquarium

Two Hawksbill sea turtles joined the exhibits at the Calgary Aquarium Wednesday.

The turtles, a gift of the Seaquarium in Miami, Florida, were presented by Capt. William B. Gray, director of collections and exhibits at the Seaquarium.

The turtles are valued for their shells, which sold for more than \$100 a ton before synthetic products replaced them, says Capt. Gray.

Capt. Gray, who helped start the tuna sports fishing industry in Nova Scotia, said he is impressed with the Calgary Aqua-



dependent non-profit corporation devoted to marine education. The Friends organization is now a part of the University of Hawaii Foundation, the umbrella organization for more than sixty assistance associations within the University. In its five and a half year history, the Friends has aided the expansion and improvement of the Aquarium and has demonstrated the effectiveness of a non-profit support group for the Aquarium. The bills provide for a transition period during which the University of Hawaii would continue to contribute operating funds.

It is my strong feeling, and that of the Board of the Friends, that this legislation would be of great benefit to the Aquarium and would permit the continued improvement and expansion of our programs and facility. We certainly urge you as members of the Friends to express your support for these bills to your legislators. If you have questions or comments, please call me and I will be happy to discuss them with you. Or, if you would like a copy of the bill, we would be pleased to provide it.

*Leighton Taylor*

### Summer Programs 1983

Summer programs for 1983 offer families, adults, and children exciting experiences in Hawaii's marine, freshwater, and terrestrial environments.

Explore the world of reef organisms on Day and Evening Reef Walks or study Hawaii's Coastal Plants on a weekend hike. Weekend workshops introduce you to Gyotaku (Japanese fishprinting), Batik (fabric painting and dyeing), and Hawaiian Shoreline Fishing Techniques. Evening sessions include gourmet Seafood Cuisine tasting, and our new lecture series, Discoveries in Marine Biology.

Mini-Courses highlight the unique ecology of Hawaiian Streamlife and the skills of Marine Aquarium set-up. Life on Hawaiian Reefs and Introduction to Hawaiian Flora are full survey courses. Seashore Life for Children exposes youngsters to the plant and animal life of the seashore.

Three-day sailing expeditions to the outer islands with Sea Trek let you explore the ocean from the shoreline to open water. And don't forget Waikiki Aquarium Dive and Marine Life Study Tours to the Philippines, Micronesia, and Tonga. Itinerary brochures are available for all trips.



### Hawaiian Turtles in Canada

Throughout the years, sea turtles have been a popular attraction at the Aquarium. Visitors can currently see three species of them while learning about their unique ecology and threats to survival. The 11 inch olive ridley in gallery 1 offers a special treat since this species is seldom seen at such a young age. This particular one was found washed ashore on Molokai, tangled-up in plastic line. He was sent to the Aquarium 15 months ago, has since been restored to health and is now growing. Sharing the outdoor seal pool is an active adolescent hawksbill, with its longer beak and spiny-edged shell, and a larger male loggerhead who sleeps quietly on the bottom most of the time.

The number of turtles at the Aquarium has waxed and waned over its 79 year history. Green turtles or Honu, the most common of Hawaiian sea turtles, were once heavily exploited for food but are now legally protected. In the past, when a surplus existed from too many donations, turtles were tagged for research and returned to the sea. Some of the green turtles released in this manner were later found happily breeding at French Frigate Shoals, 500 miles up the Hawaiian chain. In 1956, three surplus green turtles left the Aquarium under somewhat novel circumstances

—aboard Canadian Pacific Airlines. This interesting and nearly forgotten story was pieced together from an old newspaper article and recent correspondence with the Vancouver Aquarium where two of the turtles are still living 27 years later. These "high-flying" turtles were sent up to Canada by former Waikiki Aquarium Director, Spencer Tinker to help celebrate the grand opening of the Vancouver Aquarium. Sea turtles don't normally occur off Vancouver, so the gift has provided millions of Canadians the unique opportunity of seeing these amazing reptiles.

It's just possible that these immigrant turtles have set a record for the length of time a green turtle has been kept in captivity. No one really knows just how long they can live, so records like this are helpful. The growth rates are also of interest. During the 27 years, the two turtles, one male and one too small to determine its sex, grew from a shell length of about 19 inches to sizes of 32¼ and 28¼ inches.

If you are ever in Vancouver, please stop by and say Aloha to our old friends!

*UH marine biologist George Balazs has been studying Hawaiian sea turtles for the past 11 years and is an active supporter of the Aquarium.*

### Mahalo to Mrs. Haig

The Aquarium staff conveyed their personal thanks to Mrs. Joan Damon Haig at a reception held in February. Mrs. Haig recently made a major donation of \$50,000 to the Aquarium in her name and that of her brother, Mr. Henry E. Damon.

The reception was attended by Chancellor Marvin Anderson and Vice-Chancellors Richard Kosaki and Kenji

Sumida of the University of Hawaii at Manoa, Executive Director Donald Mair of the University of Hawaii Foundation, and the Friends of the Waikiki Aquarium Board of Directors.

It was a pleasure meeting both Mr. and Mrs. Alexander Haig and their son Michael and welcoming them as members of the Friends of the Waikiki Aquarium.



tant. A well rounded diet helps to build your fish's resistance to disease problems in the beginning. Feeding your fish different types of food will increase the variety of vitamins in the diet.

Treating new fish in a separate tank before introducing them into your aquarium will minimize the risk of bringing new disease into the aquarium. Avoid treating invertebrates with fish. Most invertebrates can not withstand fish treatments. While treating fish, feedings should be reduced. Treatments can often cause fish to become uninterested in food, at least initially. Food can be gradually increased as the treatment continues. Treatments work against disease but they can also be detrimental to your aquarium's biofilter, another reason to restrict feeding and subsequent waste products during treatments.

These few guidelines should help to minimize disease problems in your aquarium—and give you healthier, happier fish! *Beth Anderson*

### Who's New at the Aquarium



The Aquarium's lawn and landscaping is looking greener and more clean cut

due to the efforts of the new head groundskeeper, John Malloe. As a field contract manager for United Services at Hickam Air Force Base, John was responsible for maintaining 300 acres, which more than qualifies him for this task. He's been a head baker, bus driver, and was even instrumental in the development of the security units for Duty Free and Andrades. He confesses, however, that he likes working at the Aquarium the best. The people are friendly and you can't beat working close to the beach.

January's Kilo i'a introduced you to Beth Anderson and Marty Wisner without showing you who they were. Say Hello to . . .



*Beth Anderson*



*Marty Wisner*

### "Encore" Reef Walks

Hawaiian reefs wear a different face under the cover of darkness—as many residents and visitors are discovering. The Aquarium's night reef walks have become so popular an activity that it's been necessary for us to create "Encore" Reef Walks this spring in order to accommodate the enthusiastic response.

Participants learn that seeing a reef during the day doesn't mean they've seen it all. Competition for food and space prompts many inhabitants to develop lifestyles that mean quiet days and active nights, a strategy that offers night-stalking Aquarium reef walkers exciting and educational glimpses at their bizarre and fascinating world in the reef by night.

The byline for the article on the Coastal Garden that appeared in the January issue of the Kilo i'a was accidentally omitted. Our sincere apologies to Kuaika Jendrusch.

### About Kilo i'a

Issue No. 27

March 1983

Editor:

Leighton Taylor

Circulation:

Patricia Raines

Printing:

Tongg Publishing

Kilo i'a is published bi-monthly by the Friends of the Waikiki Aquarium and is dedicated to increasing the community's knowledge of the Waikiki Aquarium and Hawaii's marine life.



WAIKIKI AQUARIUM

University of Hawaii  
Waikiki Aquarium  
Honolulu, Hawaii 96822

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## Our Friends Write Us

Occasionally, our friends write us with suggestions and comments. This month, we wish to share two letters with you. One is from a botanist who did research in the Waikiki Aquarium area

Drs. Otto and Isa Degener

Dear Sir:

I came from New York City with my sister in 1922 on the SS *Wilhelmina* as a typical tourist when Waikiki was still beautiful with just the Moana, a series of cottages and duck ponds, and a boardwalk straight over the reef with a roofed end where I imagined Prince Kuhio ("Cupid") entertained his guests. The trolley company, some years before, to stimulate tourist travel on their open cars, built the Waikiki Aquarium...

Fascinated by the Island I enrolled at The University of Hawaii in 1922 as a Graduate Student in Botany ... For my minor project I studied under Dr. Charles H. Edmondson, working on the hermit crabs of the Islands. My collecting was mostly off the Waikiki reef and occasionally at Halesiwa and Kaimuki, I studied my catches at the Aquarium Laboratory with the aid of books & specimens from the Bishop Museum. ... I got my Master's Degree that year. It was interesting for me riding the trolley from near the Pleasanton Hotel where I lived for the Aquarium via McCully. There the alai had become so accustomed to trolleys continuously passing over the brackish swamps that they would be feeding unconcerned with their brood of chicks not far from the trolley's wheels.

Two were in charge of the Waikiki lab., where U.H. students learned Zoology (no courses were given about algae or seaweeds!). The Prof. was very efficient Dr. Charles H. Edmondson who was perhaps a bit too formal for some of the timid students to dare ask questions. Instead, they would ask the very delightful factotum and enthusiastic laboratory assistant, the middle-aged Mr. Jens M. Ostergard who would answer them in detail in good English with a foreign accent.

Remember, the trolley company started the Waikiki Aquarium. Mr. Ostergard had been, not a botanist, but a conductor on the Manoa Valley trolley run. In those days, all residents of Manoa were by common consent not to sell or rent to other races, Caucasian. The family would eat an early breakfast, usually prepared by Japanese servants. The men of the house then took the trolley downtown to open their businesses while their wives just dressed in bathrobes, returned to bed. A couple of hours later they would get ready to take the trolley downtown to do their marketing. They dressed properly, wearing a shirtwaist with hooks & eyes in the back. Alone at home, they were forced to enter the trolley unhooked and, I was told, would ask kindly (Mr. Ostergard to hook them up before they disembarked to shop.)

Mr. & Mrs. Ostergard...in my time owned (leased?) the tennis courts masks of the Moana Hotel, earning additional income from mostly tourist players.

Mr. O., during his spare time taking care of the lab. and acting as lab. assistant, painted in water colors the nudibranchs he collected along Waikiki... Being such an expert in the group, he published numerous new species, I remember many appeared in color in a Nat. Geographic Mag., years ago!!! Most interesting & colorful.

I collected flowering plants extensively on the major Islands during my two years, attempting to identify them...It was hopeless to identify my catch properly, so I returned to my home city of New York with my herbarium specimens ... After identifying my plants and wanting to produce my "Flora Hawaiiensis", I returned to Hawaii, teaching Botany at the Univ. of Hawaii in 1925-27 and collecting as many plants as possible. In fact in 1928 I concentrated botanizing on Molokai and in 1929, employed as the first Naturalist of our one Haw. Nat. Park, I concentrated on collecting about Kilauea & Mauna Loa, and the lowlands in general. Thereafter I returned to the NY Bot. Garden to identify my new finds properly.....

Aloha,



Katie Takekita

Gentlemen:

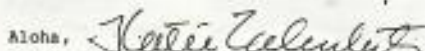
Yesterday with the public schools out of session, I took my son (age 9) and his friend (age 10) to visit the Aquarium. I must tell you truthfully that none of us have visited the Aquarium in the last three years and the children were upset that the visit to the Zoo would be shortened to visit the Aquarium.

Our visit to the Aquarium yesterday brought back my own visits as a child -- I could see the "magic" on their faces as they walked to each display, carrying the tape phones. Being raised in Waipahu each outing to the Aquarium was eagerly awaited and I was never disappointed in seeing the displays. But the few times that I have visited the Aquarium as an adult there was no doubt that the "magic" could not be recaptured.

But I was wrong; yesterday brought back many good memories. Your Aquarium has improved 100%. I don't know whether it's the phones or the variety of fishes but definitely there is an improvement in the aesthetic beauty of the displays! The colors in each display add the "magic" to not only the displayed fishes but causes the required effect to children and adults. I especially liked the displays in the hallways leading to each cubicle -- really a work of art! And the final cubicle displaying sunlight into the displays are such a joy and a wonderful way to end the tour! All in all I was much impressed and happy that once again the Aquarium had achieved not only an informative exhibit but one that really captures the heart!

It was truly a visit that none of us will forget and it will be soon when we pay yet another visit.

Aloha,



## Honor Among Friends

Friends' Board Member, Dr. John Bardach of the Resource Systems Institute of the East-West Center in Honolulu (also former Director of Hawaii Institute of Marine Biology and author of widely known texts on Ichthyology and Aquaculture) was appointed an Honorary Life Fellow of the Pacific Science Association. This honor, presented recently at the annual meeting in New Zealand, was based on his scientific eminence, research done in the Pacific area, and contributions made to the Association. He was also appointed by the National Academy of Sciences to represent the United States in the Pacific Science Association. Dr. Bardach has been a friend of the Aquarium for many years, and we have been fortunate to have his service on the FOWA Board of Directors since its inception.

Also honored at the conference were two other Hawaiian scientists with links to the Aquarium. Dr. Maxwell Doty, a botanist at the University of Hawaii, received the Hatai Medal from the Japanese National Council of Sciences for his research, some of which has been conducted on the reef adjacent to the Aquarium. In the 1960's Dr. Doty's laboratory occupied the second floor of the Aquarium where the Director's office, other administrative offices, and the laboratory are now located.

Dr. Kenneth P. Emory, senior anthropologist at the Bishop Museum, was awarded the Gregory Medal for outstanding research in anthropology. Dr. Emory was a consultant for the Aquarium's "Hawaiians and the Sea" exhibit.

Staff and Friends of the Aquarium are proud of our association with these distinguished scientists and wish them hearty, and well deserved, congratulations.

## Preventing Disease in your Home Aquarium

Disease problems in the home aquarium can often be prevented by following a few simple guidelines.

A common cause of disease outbreak is poor water quality. Water should be changed on a regular basis. The gravel should be stirred occasionally to prevent a crust from developing. A crust will inhibit water flow through the bio-filter. Having plenty of air for a high turnover rate is also a big advantage.

The nutrition of your fish is very impor-





WAIKIKI AQUARIUM

# Kilo i'a

## LOOKING AT THE SEA



### Aquarium Apple Polishers

Staff members are rapidly learning to polish the Apple (as well as program and operate it). Thanks to Apple Computer, Incorporated of Cupertino, California, the Aquarium now has an Apple II computer system with disc drive, printer, and important research software. The Apple Company donated this system to the Waikiki Aquarium, making a twin gift to Steinhart Aquarium of San Francisco.

The Waikiki Aquarium system was used recently in a shark-research project in South Australia. Aquarium Director Leighton Taylor and Dr. John McCosker, Director of Steinhart Aquar-

ium, conducted research on great white sharks, and the computer was used to interpret data directly aboard the chartered research ship.

Now back in Waikiki after its expedition down under, the computer will be used in a variety of projects, ranging from water chemistry and nutrition research to accounting and bookkeeping. A soon-to-be-acquired telephone hook-up will permit inexpensive and efficient communication with the Steinhart Apple so that information on exchanged animals, water quality, and other subjects can be rapidly exchanged between the two institutions.

### New Corporation Proposed

The 1983 Legislature now in session is considering an issue of major importance to the Waikiki Aquarium. Bills have been introduced which will create a new quasi-public, not-for-profit corporation called the Hawaiian Islands Aquarium Corporation which would operate the Aquarium under a lease from the University of Hawaii. The two bills (House Bill 1517 and Senate Bill 1089) are essentially identical and have the support of the Friends of the Waikiki Aquarium Board, the Chancellor's Office of the University of Hawaii, Manoa, and growing numbers of legislators.

The establishment of such a corporation has been recommended in two studies on the Aquarium and is based on the successful models of the National Aquarium in Baltimore and the New England Aquarium in Boston. The new corporation would lease the Kapiolani site and Aquarium building from the University of Hawaii but would be totally responsible for the programs, development, and expansion of the Aquarium. Such a corporation would be free to collect admission (rather than donations) and to seek state and private funding for Aquarium expansion. Under the present arrangement, the University of Hawaii is charged with the administration of the Aquarium and it is not legal for the Aquarium to charge admission. It is also highly unlikely that the Aquarium would receive capital improvement program funds through the University system.

Essentially, the bill would permit the Friends of the Waikiki Aquarium to become a full-fledged, separate and in-



HAWAIIAN TURTLES IN CANADA

Throughout the years sea turtles have been a popular attraction at the Waikiki Aquarium. Visitors can currently see 3 kinds on display while learning something about their unique ecology and threats to survival. The 11 inch olive ridley in gallery #10 offers a special treat since this species is seldom seen at such a young age. This particular one was found washed ashore on Molokai tangled-up in plastic line. Since being rescued and sent to the Aquarium 15 months ago, the turtle's health has been restored and it is now growing well. In the Aquarium's large outside pool, an adolescent hawksbill can be easily recognized by its longer beak and spiny-edged shell. This turtle is often found actively swimming in and out of passages through the artificial reef. In contrast, the large male loggerhead that shares the pool prefers to sleep quietly on the bottom most of the time.

The number of turtles living at the Aquarium has waxed and waned over its 71-year history. In the past, when a surplus existed from too many donations, turtles were tagged for research purposes and returned to the sea. Some of the green turtles released in this manner were later found happily breeding at French Frigate Shoals, 500 miles up the Hawaiian chain. Green turtles (often called "honu") are the most common of Hawaiian sea turtles, but they are now legally protected because too many were eaten in the past. Back in 1956, 3 surplus green turtles left the Aquarium under somewhat novel circumstances-- aboard Canadian Pacific Airlines. This interesting and nearly forgotten story has been pieced together from an old newspaper article and recent correspondence with the Vancouver Aquarium, where 2 of the turtles are still living 27 years later. These "high-flying" turtles were sent up to Canada by former Waikiki Aquarium Director Spenser Tinker to help celebrate the grand opening of the Vancouver Aquarium. Sea turtles don't normally occur off Vancouver, consequently Mr. Tinker wanted to share a few from Hawaii so Canadians could see these amazing reptiles in real life. Surely millions of adults and children have so benefited over the years.

It's just possible that these immigrant turtles have set a record for the length of time a green turtle has been kept in captivity. No one really knows



just how long they can live, so records like this are helpful. The growth rates are also of great interest. During the 27 years, the two turtles grew from a shell length of about 19 inches to sizes of 28-1/4 and 32-1/4 inches. The larger turtle is an adult male, a fact known by the long, large tail. The smaller one is probably a female, but it's still not quite large enough to be sexually mature. Maybe in a few more years.

If you are ever in Vancouver, please stop by and say Aloha to our old friends!

George Balazs

---

UH marine biologist Balazs has been studying Hawaiian sea turtles for the past 11 years and is an active supporter of the Aquarium.

---

February 18, 1983

Mr. Greg Tarry  
Curator of Animal Collections  
Calgary Zoological Society  
P. O. Box 3036, Station "B"  
Calgary, Alberta T2M 4R8  
CANADA

Dear Mr. Tarry:

Thank you very much for your informative letter of December 15, 1982 answering my inquiry about two Hawaiian sea turtles sent to the Calgary Aquarium. I was sorry to learn that the facility closed down. Though I wouldn't want you to go to great trouble, yes, I would appreciate having the names and addresses of any former employees known to you. If the turtles are still alive at another facility, it would indeed be worthwhile for me to have this information. I am primarily interested in comparative growth rates for wild and captive turtles held for extended periods. For example, the Hawaiian green turtles that have been at the Vancouver Aquarium for about 26 years have still not reached a size equal to our smallest recorded nesting female in the wild.

Once again, I appreciate your assistance.

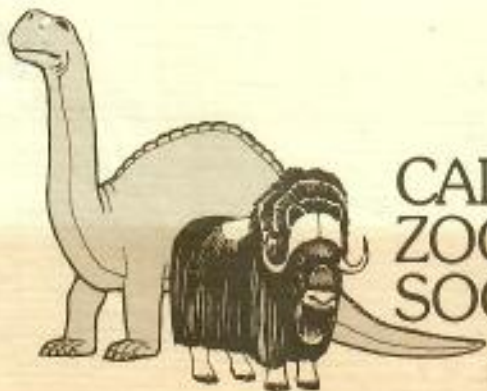
Sincerely,

GEORGE H. BALAZS  
Assistant Marine Biologist

GHB:ec

Enclosures





CALGARY  
ZOOLOGICAL  
SOCIETY

CALGARY ZOOLOGICAL SOCIETY  
P.O. BOX 3036, STATION "B"  
CALGARY, ALBERTA T2M 4R8

ST. GEORGE'S ISLAND, CALGARY, ALBERTA / TELEPHONE (403)265-8310

December 15, 1982

George H. Balazs  
Assistant Marine Biologist  
University of Hawaii at Manoa  
Hawaii Institute of Marine Biology  
P.O. Box 1346  
Coconut Island, Kaneohe  
Hawaii 96744

Dear Mr. Balazs:

I'm answering your letter on behalf of Mr. Karsten who is out of town at this time. The two sea turtles which were sent to Calgary in 1960 did not actually come to the Calgary Zoo but to a totally separate institution the Calgary Aquarium. In the mid to late 60's the Aquarium was disbanded and the stock from that Aquarium was transported to several other institutions and I'm not aware of any way of tracing the various animals that were in the collection. If the matter is particularly significant we may be able to trace some of the employees who worked there but with the time that has passed since the aquarium disbanded you can I think appreciate the difficulties involved.

I hope this information will be of some help to you and sorry we could not provide a more positive answer.

Sincerely,

A handwritten signature in cursive script that reads "Greg Tarry".

Greg Tarry  
Curator of Animal Collections  
CALGARY ZOO

GT/pj

Marine Turtles Released from the Waikiki Aquarium

June 1, 1976 - Hanauma Bay

compiled by G. H. Balazs

| <u>Tag Nos.</u>           | <u>Straight carapace measurements 2/2/76</u> | <u>Sex</u> | <u>Species</u>       |
|---------------------------|--|------------|----------------------|
| 1751; 924RFL              | 27½ x 23                                     | M          | green                |
| 1753; 916 <sup>LF</sup>   | 29 1/8 x 24¼                                 | F          | green                |
| 919LFL; 920 <sup>RF</sup> | 26½ x 21½                                    | M          | green                |
| 1750; 921                 | 22½ x 18 1/8<br>(57mm x 46)                  | ?          | green Sabah-Benedict |
| 917LFL; 918RFL            | 30 1/8 x 24 1/8                              | F          | hawksbill            |
| 922LFL; 923RFL            | adult size                                   | F          | green                |



# Taking



Foote



Kam



Nishiguchi



Sakamoto

## Rotary Chief

John S. Foote, vice president and general manager of the Otani Kaimana Beach Hotel, has been elected president of the Rotary Club of Waikiki.

Other officers are Jerry Hennings, president-elect; Paul Maehara, treasurer; Darvin Haupt, secretary, and Ed Philippet, sergeant-at-arms. Directors are Marvin Hall, the Rev. Mike Murphy, Phil Chang, Richard Ariyoshi and Ship Shipley.

## Scholarship

Lari D. Kam, a Punahou School graduate, has received a \$100 Edward Frank Kraft Scholarship Prize for her record during her first quarter at the University of California at Berkeley.

She also has been elected to the Undergraduate and Graduate Honor Society.

## Business Women

Sharon Amano has been elected president of the Maile Chapter of the American Business Women's Association.

Also elected were Shari Kageyama, vice president; Pamela Bjerke, recording secretary; Eloise Lu, corresponding secretary; and Sharon Elwell, treasurer.

## Freedoms Chapter

Mrs. E.W. Facer has been elected president of the Hawaii Chapter of the Freedoms Foundation at Valley Forge.

Other officers are Margaret Sinclair, Maurine Brinegar, Mrs. Leonard Werner and Melinda Facer, vice presidents; Mrs. Harold Goodrich, recording secretary, Mrs. Robert Leuchtman, corresponding secretary; and Mrs. Edwin Major, treasurer.

## Awarded Medal

Kenneth Kamemoto, a Roosevelt High School student and son of Mr. and Mrs. Fred Kamemoto, has been awarded a medal for outstanding achievement in mathematics and science from the Rensselaer Polytechnic Institute in Troy, N.Y.

He is among 1,600 high school juniors who received the award.

## Aquarium Board

Richard Kosaki, University of Hawaii political science professor, has been selected to serve a two-year term as board chairman of the Friends of the Waikiki Aquarium.

Other officers are Michael Tongg, vice chairman; Patricia Raines, secretary, and Lynn Donaldson, treasurer.

## Fukunaga

Seven business awards are given to students who have been recipients of Fukunaga Scholarship awards are given to Hawaii students Lee A. \$2,000; Karlen S. \$2,000; Michael I.J. Shen, \$2,000; Imouye, \$2,000; and Pechous, \$2,000; and Gaehten, University of California at \$2,000; and Laurie

## Merit Co

Frederick D.S. and finance professor of Hawaii, has written to be published issue of Management

The article, "A C to Accounting Harn selected from manuscripts in the National Accountants international.

## Japanese C

Norman A. Shiga was installed as president of the Honolulu Japanese Chamber of Commerce by Lt. Gov. J the chamber's annual banquet.

Also installed were Tokioka, president; O'Reilly and Perc; vice presidents; Haka, secretary; and Yanagawa, treasurer.



# Notice

## Awards

Administration student named recipient of scholarship from University of Hawaii. Y. Nishiguchi, \$2,000; Takamoto, \$2,000; Audrey Y. \$500; Elizabeth Ann and Richard A. von University of Denver, Ann Lau, University of Berkeley, \$2,000.



Inouye



Pechous



Von Gnechten



Lou

## Certificate

Choi, accounting or at the University received a certificate for an article he published in the August Accounting.

Cluster Approach "Automation," was among 1,300 manual Association of International competi-

## Chamber

amura recently resident of the Chamber of Commerce King during annual installation

ere Lionel Y. elect; Hugh F. K. Mirikitani, old K. Yamana and Milton Y.

## March of Dimes

Steve Kelsey has been appointed community service coordinator for the Pacific chapter of the March of Dimes Birth Defects Foundation.

He has worked for the Muscular Dystrophy Association, the Hawaii Committee on Alcoholism and the Department of Social Services and Housing.

## Top Pharmacist

Carol Parker, recently elected vice president of the Hawaii Pharmaceutical Association, has been named pharmacist of the year by the group.

In last week's Taking Notice column, another person was listed incorrectly as receiving the honor.

## \$800 Scholarship

Eileen A. Mortenson, a Chaminade University student, has been given an \$800 Stephen Bufton Memorial Education Fund scholarship by the

national headquarters of the American Business Women's Association.

The association's Aloha Chapter awarded \$150 local scholarships to Judith Colle, Mary Lou Habon and Shirley Befitel.

## Kaneohe Lions

Harold Aloiau has been elected president of the Kaneohe Lions Club.

Other officers are Harold Dill, Maxie Matsuki and Moses Iokua, vice presidents; Moody Bryan, secretary; and Rudy Duncan, treasurer.

*Taking Notice is a weekly compilation of honors, scholarships, awards and elections to professional or civic groups won by people in Hawaii. Material submitted for Taking Notice should be mailed to the City Desk, Star-Bulletin, P.O. Box 3080, Honolulu 96802 or brought to the News Building. It should be typed or printed and must include the name and telephone number of the person submitting the material. No material will be taken by phone. Photographs may be offered for consideration but cannot be returned and publication cannot be guaranteed. The material is screened for eligibility.*



bedspreads,  
Comforters,  
blankets,  
pillows &  
mattress



March-April 1986

The Waikiki Aquarium was grieved by the death of Tuffy, a 19-months-old male Hawaiian monk seal. Tuffy came to the Aquarium as an abandoned pup and was hand-raised to robust health by dedicated staff and volunteers. Tuffy proved himself to be an active, alert, intelligent animal that cooperated eagerly with the Aquarium's training program designed to add to the world's knowledge of this endangered species. The Aquarium's research policy combines a recognition of the need for more information about the seals with the utmost concern for animal welfare.

A special research program conducted by University of Hawaii and National Marine Fisheries Service scientists on seal metabolism has been cancelled. Aquarium staff believe that the risk to the animals is too great and are concerned that the rigors of this research program may have proved fatal to Tuffy. Therefore, only research that is non-intrusive and behavior-oriented or required medical examinations will be permitted on monk seals held in the Aquarium's care.

# Laysan Monk Seal Visits Aquarium

The friendly Hawaiian monk seal splashes around, clowning for those who visit the Waikiki Aquarium like many a trained seal, but the reason he is here on Oahu is research.

The young male animal is the only member of his endangered species — *Monachus schauinslandi* — in the populated portion of the Hawaiian Islands. Up until about six weeks ago he lived with fewer than 1,000 other survivors in the uninhabited Northwestern Hawaiian Islands.

Curator Bruce Carlson explained that the aquarium only was able to get a special permit to take him from his home on Laysan Island so they can study him to learn more about his species to help preserve it.

Carlson said the 2-year-old seal will stay at the aquarium indefinitely.

And although he is now in the large pool near the building's entrance, he will not always be on display. Instead, he will be in smaller research tanks where scientists can study his behavior, feeding patterns and biology.

The monk seal is one of Hawaii's two native mammals. The other is a bat.

Patricia Raines, community relations coordinator for the aquarium, said there will probably be a contest to name the animal after he gets accustomed to his new environment.



**RARE SEAL**—A rare Hawaiian monk seal peers out of a viewing window of his pool at the Waikiki Aquarium as Patricia Raines, community relations coordinator, looks on. —Star-Bulletin Photo by Craig T. Kojima.

HSB Oct 4, 1983 A-3





Melodora 80-87



10/2/83  
Sunday  
SSB & A  
Front  
Page

### A rare stare

Here's a peek at a rare Hawaiian monk seal that is now on display in the Waikiki Aquarium's largest pool. The endangered animal was caught by the National Marine Fisheries Service in the Northwest Hawaiian Islands about a month ago and turned over to the aquarium. The unnamed male will be studied, a spokeswoman said, so scientists can learn how to help the remaining seals, which number less than 1,000.

Advertiser photo  
by Gregory Kahumoto



George - the first valley in  
our coming attempt to raise money  
for our Turtle Pond

(CO)

# LAE AHI

Waikiki Aquarium Newsletter

Vol. I No. 1

April, 1974

## TURTLES SEEK NEW HOME...

The Aquarium's resident ocean turtles all thirteen of them, make their home at the makai end of the 70,000 gallon pool which also houses the seals. If you look closely you can distinguish eight green, three hawksbill and two loggerhead turtles. The green turtles have oval shells, the hawksbills have curved beaks and the loggerheads, the largest residents, have round shells. While they are obviously all doing very well, both they and the Aquarium staff are hoping for new accommodations for them very soon.

Dependent upon being able to come up with the money, plans call for a large pool of at least 6,000 gallons to be built on the Diamond Head side of the seal pool and makai of the carp pond. Right now the turtles are mating and laying eggs in the pool but the eggs must be laid in sand to have any chance of hatching. It's heartbreaking to think of the waste of these eggs as the green sea turtle is noticeably on the decline, and legislation is pending in the State Legislature to protect it. The longer the Aquarium is without funds for the pool, the greater the loss of baby turtles which could be released back to the sea to keep up the supply of turtles around the islands.

The Aquarium has presently three baby sea turtles, in the nursery in the back, which have doubled in size in the year since they joined the Aquarium family. They are being taken care of by a student from one of the local elementary schools. Once the pool is built there will hopefully be many more companions for these little fellows, all destined to be released as soon as they are big enough to survive at sea.

Look again at the turtles in the pool. Females which measure 36 inches from front to back are mature enough to reproduce. Recently, as you may have read in the local newspapers, the Aquarium released a number of mature female turtles off Waikiki and, thanks to the Coast Guard, out to sea. Reports from fishermen indicate that these turtles have spread throughout the islands, meaning that they have adapted well to life at sea.

## ... CARP ENJOY THEIRS

The new spacious quarters for the Aquarium carp and terrapin were completed only last fall and the residents adjusted right away. The carp were formerly housed in the tank that now contains the electric eel and the terrapin were in the central pool, under Pretty Boy, the mynah bird official greeter of the Aquarium (Did he say Aloha as you entered?).

All the Aquarium staff pitched in to build this gracious pool and to landscape the area around it with tropical Hawaiian foliage. Not only can you see orchids, ferns and palms (grown from the Aquarium's own coconuts) but also a collection of quite tame local birds. The Aquarium's custodian, Harry Cordeiro, is a push-over for the birds and you'll see a variety of them waiting for their daily handout. Look especially for the Brazilian cardinals with their flaming red heads but you can also spot various kinds of doves and pigeons plus some escaped cage birds which have made Kapiolani Park their home.

People sometimes ask why the soft-shell turtle is in the old terrapin pond and not in with the carp enjoying the obvious advantages of the lovely tropical setting. It's not because he's aggressive (he's actually quite docile), it's because he is a fantastically able climber. His long claws enable him to climb straight up for several feet and when he was put in the new pool he kept climbing out of the rock enclosure and burying himself in the Aquarium yard. He's in the terrapin pond because he's too good at climbing.

The carp, incidentally, were all gifts to the Aquarium, many coming from Spencecliff Corporation when Queen's Surf was closed.

## LECTURES

Slide presentations to school groups (K-12) used to be a regular offering of the Waikiki Aquarium in the facility's auditorium. However, the recent fund and personnel cuts have forced the staff to curtail these presentations over the past several years.



## TURTLES SEEN NEW HOME...

The Aquarium's resident ocean turtles all thirteen of them, make their home at the makai end of the 70,000 gallon pool which also houses the seals. If you look closely you can distinguish eight green, three hawksbill and two loggerhead turtles. The green turtles have oval shells, the hawksbills have curved beaks and the loggerheads, the largest residents, have round shells. While they are obviously all doing very well, both they and the Aquarium staff are hoping for new accommodations for them very soon.

Dependent upon being able to come up with the money, plans call for a large pool of at least 6,000 gallons to be built on the Diamond Head side of the seal pool and makai of the carp pond. Right now the turtles are mating and laying eggs in the pool but the eggs must be laid in sand to have any chance of hatching. It's heartbreaking to think of the waste of these eggs as the green sea turtle is noticeably on the decline, and legislation is pending in the State Legislature to protect it. The longer the Aquarium is without funds for the pool, the greater the loss of baby turtles which could be released back to the sea to keep up the supply of turtles around the islands.

The Aquarium has presently three baby sea turtles, in the nursery in the back, which have doubled in size in the year since they joined the Aquarium family. They are being taken care of by a student from one of the local elementary schools. Once the pool is built there will hopefully be many more companions for these little fellows, all destined to be released as soon as they are big enough to survive at sea.

Look again at the turtles in the pool. Females which measure 36 inches from front to back are mature enough to reproduce. Recently, as you may have read in the local newspapers, the Aquarium released a number of mature female turtles off Waikiki and, thanks to the Coast Guard, out to sea. Reports from fishermen indicate that these turtles have spread throughout the islands, meaning that they have adapted well to life at sea.

But, it's not only the turtles and conservationists who will be happy with the new quarters for the turtles. The Aquarium seals will be happy as well. They get their whole tank back to frisk in and won't have to worry anymore about their flippers being nipped while they are dozing half-in and half-out of the water.

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## LECTURES

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Now, a renewed emphasis on such lectures is planned by the Aquarium with Phil Lobel of the UH Zoology Department at the helm. Teachers who wish to have a presentation made to their classes should schedule excursions for Tuesday mornings. For more information phone the Aquarium at 923-9741.



## FRIDAY IN THE LIMELIGHT

The Aquarium's super star, Friday the Hawaiian Monk Seal, has been very much in the public eye recently. He has appeared in the local newspapers and on several television stations, the occasion being the tenth anniversary of his coming to the Aquarium. Friday is the only Hawaiian Monk Seal in captivity anywhere and is on the endangered species list, so he is rare as well as being quite a character.

Friday is the largest of the Aquarium's seals and is obviously the boss of the pool. He keeps the other seals in line and occasionally his trainers too! The other seals are Celia, nineteen years old and partly blind, Baby, the smallest, and Bashful. Celia, Baby and Bashful are all harbor seals from the Pacific Northwest.

Friday was caught on Kure Island and flown to Hawaii. He is now at his peak and the Aquarium has requested permission to have a female monk seal to keep him company in the hopes of a series of Friday juniors. He's a healthy 350 pounder and should live for another ten or more years.

But it's at meal time that Friday really shines. For his diet of 10-14 pounds of fish per day he turns in the water, calls for his food by barking and waves his flipper for seconds. Celia, by contrast, stays right on the island, Baby will come and gently take food from her trainer while Bashful stays in one corner of the pool patiently waiting for fish.

But Friday is not just a performer. He is the subject of a scientific study being conducted by UH scientist Causey Whittow. You can spot Dr. Whittow on sunny days laying a boom thermometer on Friday's belly as Friday snoozes on the island oblivious to the world after a satisfying meal of fish.

He is every bit a star and after observing him it's obvious that he knows it.

## ONE OF THE OLDEST

Founded in 1904, the Waikiki Aquarium is the fourth oldest in the U.S., younger only than the National Aquarium in Washington, D.C. (1871), the New York Aquarium (1896), and the Belle Isle Aquarium in Detroit (1903). The present building is the Aquarium's second home; the first was located closer to the Queen's Surf pavilion and was torn down in 1954.

Every year approximately 300,000 visitors come to the Aquarium; countless others make use of the various services that the Aquarium offers, including free purified sea water to owners of saltwater tanks, and meeting and activity space for various local organizations, including the Hawaii Shell Club Board, the Audubon Society, various dive clubs and visiting lecturers, the Junior Shell Club and the Hawaii Science Teachers, etc. In addition, members of the Aquarium staff make themselves as available as possible for lectures to various school and community groups.

In addition to a regular staff of 13 (when all positions are filled) there is a volunteer staff composed of members of the community and a number of university students who live on the property to provide security after hours.

The statistics of keeping the Aquarium going are impressive. A series of pumps in the back supply 400 gallons of water per minute or 500,000 gallons per day. Feeding the Aquarium residents costs \$10,000 per year, most of which is spent on aku, herring, squid and smelt. The Aquarium's electric bill is about \$3,600 per year, the water bill runs about the same.

The Aquarium enjoys international respect for the Directory of Public Aquaria which it has published since 1960 after Mr. Spencer Tinker, past director of the Aquarium, agreed to undertake the big task when he attended the Institut Oceanographique in the Principality of Monaco.

WAIKIKI AQUARIUM  
2777 Kalakaua Avenue  
Honolulu, Hawaii  
96815



SURVIVORSHIP AND LONGEVITY OF A LONG-LIVED  
VERTEBRATE SPECIES: HOW LONG DO TURTLES LIVE?

BY J. WHITFIELD GIBBONS AND RAYMOND D. SEMLITSCH

*Savannah River Ecology Laboratory, Drawer E, Aiken, South Carolina 29801 U.S.A.*

## SUMMARY

(1) A 13-year mark-release-recapture study on natural populations of freshwater turtles, *Pseudemys scripta*, of known age indicates that approximately 1% of the individuals can be expected to attain an age of 20 years.

(2) Probable maximum longevity in natural populations is about 30 years, in contrast to published estimates of up to 75 years.

(3) Adults follow a Type II survivorship curve with constant rates of mortality at all ages, as do many other long-lived species that have been studied.

## INTRODUCTION

In the study of natural populations of animals, the survivorship pattern is a critical life history attribute but is difficult to determine. Many theoretical life history models depend upon whether a species is short-lived or long-lived (Tinkle 1969; Stearns 1976); therefore, quantitative assessments of age structure, survivorship, and longevity are essential to certain life history concepts.

Determinations of maximum longevity have been made for many species because of the ease by which lifespan can be recorded in individuals under certain circumstances, such as in zoos. In a comparison of more than 700 species of vertebrates representing all major classes, turtles and crocodylians were unquestionably the longest-lived (Gibbons 1976). Maximum longevity under zoo or laboratory conditions may reflect comparative age structures and survivorship patterns, but the relationship between them is known in few natural populations, particularly those of long-lived species.

Age structure and survivorship patterns have been accurately determined in short-lived species of lizards (Tinkle 1967; Dunham 1978) and some that live for 5-9 years (Zweifel & Lowe 1966; Tinkle & Ballinger 1972). This is relatively short compared to turtles, many species of which do not reach maturity before 5 years of age (Tinkle 1961; Gibbons 1968; Ernst & Barbour 1972; Wilbur 1975; Swingland 1977; Gibbons *et al.* 1981; Tinkle, Congdon & Rosen 1981). Individual captive (Gibbons 1976) and, on occasion, wild-caught turtles (Schneck 1886; Blair 1976; Stickel 1978) have been documented to live more than 50 years.

Although longevities are impressive for some turtles (Blair 1976), overall survivorship pattern is difficult to establish for these, or other animals because of the difficulty of verifying the age of individuals that pre-date the study. Growth annuli (Deevey 1947; Jones 1981) can be used effectively with some turtles (Sexton 1959). Our objective is to document the general pattern of survivorship and longevity in a freshwater turtle and to compare the results with reports for other long-lived animals. Our findings are based on long-term studies of turtles whose age was determined by the use of growth annuli and the mark-release-recapture technique.



Few studies have lasted long enough to estimate with confidence the maximum longevity of a significant portion of a natural population of turtles (Woodbury & Hardy 1948; Legler 1960; Wilbur 1975; Blair 1976; Stickel 1978). In *Pseudemys scripta* (Schoepff), examined by us, previous investigators have estimated that individuals in natural populations may attain ages from 30 (Moll & Legler 1971) to 75 years (Cagle 1950). Individuals in the closely related *Chrysemys picta* have been estimated to reach 40 years of age (Gibbons 1968; Wilbur 1975). We provide evidence of maximum longevity and the survivorship pattern of the slider turtle, *P. scripta*, based on 13 years of data from South Carolina populations.

## METHODS

Mark-release-recapture studies began in aquatic habitats (Gibbons & Patterson 1978) on the U.S. Department of Energy's Savannah River Plant near Aiken, South Carolina, U.S.A., in July, 1967, and continued to the present. During this period 2888 *P. scripta* have been individually marked and 2204 subsequently recaptured. Turtles were collected by a variety of means over the study period, but the majority were captured in aquatic hoop traps or by terrestrial drift fences and pitfall traps (Gibbons 1970). Certain critical records were obtained by finding the shells of dead, marked individuals during frequent searches in areas peripheral to aquatic study sites.

A variety of standard measurements (Gibbons 1969) were taken on each live individual or shell including age, when possible, using the annuli method (Sexton 1959) and plastron length. Therefore age could be determined in older, recaptured individuals without discernible annuli if they had been accurately aged as juveniles.

The most intensive field studies were conducted in Ellenton Bay, a natural freshwater habitat and a typical Carolina bay. Carolina bays are a regional, unexplained geological phenomenon occurring throughout much of the southern Atlantic Coastal Plain and represent the dominant lentic habitat for semi-aquatic vertebrates, including freshwater turtles. Carolina bays vary in size but are always ovate in shape with the long axis oriented northwest-southeast. They characteristically have no tributary water supply so that water level is dependent exclusively upon precipitation and evaporation. Consequently annual variations in rainfall at Ellenton Bay have resulted in an aquatic habitat ranging from fewer than 100 m<sup>2</sup> of shallow (<20 cm) open water (in 1968 and 1981) to an aquatic area more than 10 ha and 1.5 m in depth (in 1977).

Despite the natural variation in the aquatic environment, Ellenton Bay has supported populations of six species of aquatic turtles (Gibbons 1970) throughout the 13 years of study. An indication of fidelity to the particular site is that each species has individuals which were marked initially in 1967-1968 and recaptured in 1980-1981. The turtle species consistently having the largest population size at Ellenton Bay is *P. scripta*. Because the Savannah River Plant is a restricted access area for security reasons, the turtle populations at Ellenton Bay receive minimal impact from human interference or industrial, agricultural, or urban activities.

The regional climate is warm temperate with a mean air temperature of 80 °F (27 °C) in July. Winter (January) mean air temperature is 46 °F (8 °C). Mean annual rainfall is 43 inches (1.1 m).



## RESULTS

A survivorship curve was constructed from 560 known-age *P. scripta* inhabiting Ellenton Bay. The curve represents a minimal estimate because each point represents the last capture of an individual and not necessarily its death. At the last capture it was assumed the individual was present during each previous age class. All biases inherent in this approach tended to result in underestimates of survivorship since the higher age classes are only represented by recaptures of animals aged by annuli when younger. The increasing ineffectiveness of the annuli method at higher ages and consequent dependence upon recapture, leads to mortality rates in the older age classes being overestimated. Long-term recapture records of all known-age individuals from other populations on the Savannah River Plant were also considered, to obtain estimates of maximum longevity.

Survivorship of *P. scripta* approximates a Type II survivorship curve (Pearl 1928), in which mortality remains at a constant rate at all ages (Fig. 1). Based on the minimal survivorship estimate, only 10% of a population lives for a decade and only 1% of the individuals reach ages greater than 20 years. Maximum longevity would be approximately 30 years (Fig. 1).

Of thirty-two turtles recaptured after 10–13 years, eight had been too old upon initial capture to be reliably aged by annuli. The elimination of these individuals from calculation

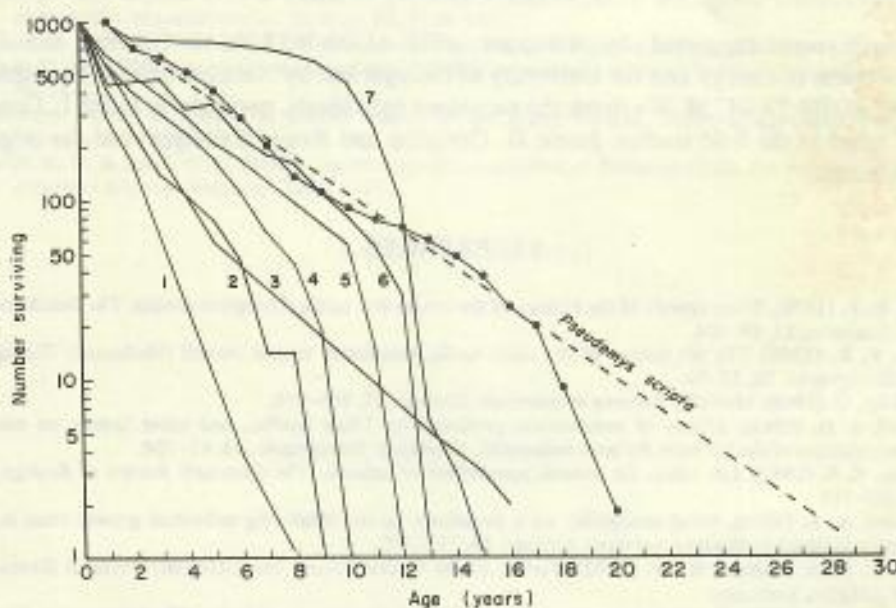


FIG. 1. Survivorship curve (unbroken line and dots) for 560 known-age *Pseudemys scripta* from Ellenton Bay in South Carolina compared to those of other long-lived species in natural populations. The dashed line for *P. scripta* represents a calculated survivorship curve based on the data from individuals 1–15 years of age ( $\log \hat{P} = 3.071 - 0.103X$ ). The numbers indicate references for survivorship curves of natural populations of other species as follows: (1) *Sceloporus virgatus* (lizard); Vinegar (1975); (2) *Balanus glandula* (barnacle); Connell (1961); (3) *Desmognathus ochrophaeus* (salamander); Tilley (1980); (4) *Larix argentatus* (bird); Paynter (1947); (5) *Chrysemys picta* (turtle); Tinkle *et al.* (1981); (6) *Hemitragus jemlahicus* (mammal); Caughley (1966); (7) *Ovis dalli* (mammal); Deevey (1947).



of the survivorship curve (Fig. 1) results in a bias of overestimating mortality in the older age classes. The ages of these individuals can be approximated from their size at initial capture and from the adult growth rates of *P. scripta* in this population (Gibbons *et al.* 1981). Even using this procedure, the oldest turtles were estimated to be less than 35 years old at the time of last capture. No known-age specimens from other populations exceeded 30 years.

### CONCLUSIONS

We conclude that the survivorship curve with the projected estimate for older animals (Fig. 1) is a realistic model of longevity for this species. We further conclude that although individual turtles held captive in protected situations can be expected to attain old ages the survivorship pattern in natural populations of these and other animals groups will reveal that the majority of the members of natural populations have much shorter lifespans than that promoted by popular conception. Furthermore, although turtles are indeed suitable representatives of long-lived species in population studies, long-term research programs (Tinkle 1979) are necessary to reveal the survivorship pattern of this or any other group in a quantitative manner.

### ACKNOWLEDGMENTS

Research was supported by Contract #DE-AC09-76SR00819 between the U.S. Department of Energy and the University of Georgia and by National Science Foundation Grant #DEB-79-04758. We thank the numerous individuals, particularly Judith L. Greene, who aided in the field studies. Justin D. Congdon and Royce Ballinger read the original manuscript.

### REFERENCES

- Blair, W. F. (1976). Some aspects of the biology of the ornate box turtle, *Terrapene ornata*. *The Southwestern Naturalist*, 21, 89-104.
- Cagle, F. R. (1950). The life history of the slider turtle, *Pseudemys scripta troostii* (Holbrook). *Ecological Monographs*, 20, 32-54.
- Caughley, G. (1966). Mortality patterns in mammals. *Ecology*, 47, 906-918.
- Connell, J. H. (1961). Effects of competition, predation by *Thais lapillus*, and other factors on natural populations of the barnacle *Balanus balanoides*. *Ecological Monographs*, 31, 61-104.
- Deevey, E. S. (1947). Life tables for natural populations of animals. *The Quarterly Review of Biology*, 22, 283-314.
- Dunham, A. E. (1978). Food availability as a proximate factor influencing individual growth rates in the iguanid lizard *Sceloporus merriami*. *Ecology*, 59, 770-778.
- Ernst, C. H. & Barbour, R. W. (1972). *Turtles of the United States*. The University Press of Kentucky, Lexington, Kentucky.
- Gibbons, J. W. (1968). Population structure and survivorship in the painted turtle, *Chrysemys picta*. *Copeia*, 1968, 260-268.
- Gibbons, J. W. (1969). Ecology and population dynamics of the chicken turtle, *Deirochelys reticularia*. *Copeia*, 1969, 669-676.
- Gibbons, J. W. (1970). The influence of terrestrial activity on the population dynamics of aquatic turtles. *American Midland Naturalist*, 83, 404-415.
- Gibbons, J. W. (1976). Aging phenomena in reptiles. *Experimental Aging Research* (Ed. by M. F. Elias, B. E. Eleftheriou & P. K. Elias), pp. 454-475. EAR, Inc., Bar Harbor, Maine.
- Gibbons, J. W. & Patterson, K. K. (1978). *The Reptiles and Amphibians of the Savannah River Plant*. Department of Energy, SRO-NERP-2, Aiken, South Carolina.
- Gibbons, J. W., Semlitsch, R. D., Greene, J. L. & Schubauer, J. P. (1981). Variation in age and size at maturity of the slider turtle (*Pseudemys scripta*). *American Naturalist*, 117, 841-845.

- Jones, D. S. (1981). Annual growth increments in shells of *Spizula solidissima* record marine temperature variability. *Science*, **211**, 165-167.
- Legler, J. L. (1960). Natural history of the ornate box turtle, *Terrapene ornata ornata* (Agassiz). *University of Kansas Publications, Museum of Natural History*, **11**, 527-669.
- Moll, E. O. & Legler, J. M. (1971). The life history of neotropical slider turtle, *Pseudemys scripta* (Schoepff), in Panama. *Bulletin of the Los Angeles County Museum Natural History*, **11**, 1-98.
- Paynter, R. A. (1947). The fate of Kent Island herring gulls. *Bird Banding*, **18**, 156-170.
- Pearl, R. (1928). *The Rate of Living*. A. E. Knopf, New York.
- Schneck, J. (1886). Longevity of turtles. *American Naturalist*, **20**, 897.
- Sexton, O. J. (1959). A method of estimating the age of painted turtles for use in demographic studies. *Ecology*, **40**, 716-718.
- Stearns, S. C. (1976). Life-history tactics: a review of the ideas. *The Quarterly Review of Biology*, **51**, 3-47.
- Streckel, L. F. (1978). Changes in a box turtle population during three decades. *Copeia*, **1978**, 221-225.
- Swingland, I. R. (1977). Reproductive effort and life history strategy of the Aldabran giant tortoise. *Nature*, **269**, 402-404.
- Tilley, S. G. (1980). Life histories and comparative demography of two salamander populations. *Copeia*, **1980**, 806-821.
- Tinkle, D. W. (1961). Geographic variation in reproduction, size, sex ratio, and maturity of *Sternotherus odoratus* (Testudinata: Chelydridae). *Ecology*, **42**, 68-76.
- Tinkle, D. W. (1967). The life and demography of the side-blotched lizard, *Uta stansburiana*. *Miscellaneous Publications of the Museum of Zoology, University of Michigan*, **132**, 1-182.
- Tinkle, D. W. (1969). The concept of reproductive effort and its relation to the evaluation of life histories of lizards. *American Naturalist*, **103**, 501-516.
- Tinkle, D. W. & Ballinger, R. E. (1972). *Sceloporus undulatus*: a study of the intraspecific comparative demography of a lizard. *Ecology*, **53**, 570-584.
- Tinkle, D. W. (1979). Long-term field studies. *Bioscience*, **29**, 717.
- Tinkle, D. W., Congdon, J. D. & Rosen, P. C. (1981). Nesting frequency and success: implications for the demography of painted turtles. *Ecology*, **62**, 1426-1432.
- Vinegar, M. B. (1975). Demography of the striped plateau lizard, *Sceloporus virgatus*. *Ecology*, **56**, 172-182.
- Wilbur, H. M. (1975). The evolutionary and mathematical demography of the turtle *Chrysemys picta*. *Ecology*, **56**, 64-77.
- Woodbury, A. M. & Hardy, R. (1948). Studies of the desert tortoise, *Gopherus agassizii*. *Ecological Monographs*, **18**, 145-200.
- Zweifel, R. G. & Lowe, C. H. (1966). The ecology of a population of *Xantusia vigilis*, the desert night lizard. *American Museum Novitates*, **2247**, 1-57.

(Received 16 July 1981)





Roy Pendang, Honolulu Aquarium attendant, pushes the 250-pound leatherback turtle ashore in the aquarium's tank. The sea turtle is one of the few in captivity.—Star-Bulletin Photo.

## Aquarium Gets Rare Turtle; She's Snooted by Old Tenants

A giant leatherback turtle, a living relic of primitive sea life, is now on exhibit at the Honolulu Aquarium. The old-timers at the aquarium tank aren't impressed by the new tenant's exclusiveness, but Spencer W. Tinker, director of the aquarium, is delighted.

Tinker said he received the 250-pound female turtle yesterday from the Big Island, where it was caught Tuesday by a Honolulu fisherman in the waters off Lyman Point.

Samuel Nuhi Jr., of 1326 Alapai Street, caught the creature, he said, when it became tangled in his fishing gear.

### IGNORED AT FIRST

Yesterday, after Tinker and his assistants uncrated the leatherback—also known as the trunk turtle—and placed it in the tank, the sea turtles and seals in the water paid little attention.

Later, however, they began "picking on her" an attendant said, the seals taking an occasional bite at the leatherback.

Tinker apparently has reason to be delighted.

His leatherback turtle is one of the very few in captivity, he said.

The leathery creature is seldom caught, he said, and his is the third one known to have been captured in Hawaiian waters since 1935.

The turtle, scientifically classified as the *dermochelys coriacea*, is of the first aquatic branches of the lizard-turtle stock.

### BLACK AND WHITE

It is black with white blotches covering its shell-less body.

Though it has no outer shell, the leatherback is divided by seven spiny ridges along its back.

It is protected by a mosaic of small bones embedded in the thick skin, but not visible.

The creature lives in nearly all warm seas, but is more commonly seen in the Atlantic.

When full grown, the *dermochelys coriacea* can weigh

as much as 2,500 pounds and measure as long as nine feet.

### LARGEST TURTLE

It is not only the largest existing sea turtle, but the swiftest and strongest.

The Hawaiians of old (at Punaluu on the Big Island, created a hula dance in honor of the turtle, believed to be an akua (Hawaiian goddess).

They called the leatherback, *Honupooka*.

Tinker said he plans to pay Nuhi a "market price" for the turtle.

He said the capture is an indication that there are more leatherbacks in Hawaiian waters.

The female turtle could not have traveled here from the Atlantic, he said.

Next to the United States, Britain carries a heavier defense budget than any other free country.

### Funeral Announcement

KIDANI, Mr. Noboru, age 25 years, of 3710 Lanikai Drive Born on May 21, 1972, in Yamaguchi-Ken, Japan, died on May 29, 1998, at 6:40 p.m. WAKA SERVICES WILL BE HELD.

(Related Story on Page 1-B)

Holiday motorists began the Memorial Day week end in a rash of minor traffic accidents last night, but police said no one was seriously injured.

Between 3 and 11 p.m., according to traffic investigators, there were 16 auto accidents, but only three were classed as major accidents.

Mrs. Marilyn Muir, 19, of 1745 South Beretania Street, was the only person hospitalized.

Police said Mrs. Muir, who is expecting a baby, was taken to the Kapiolani Maternity Hospital after her husband's car was rammed from the rear on Kapiolani Boulevard around 8:15.

### HOSPITALIZED

Mrs. Muir was not injured, police said, but confined to the hospital for observation because of her condition.

An estimate of damages caused in the 16 accidents was not available, police said, but damages were not considered to be extensive.

### GOVERNOR REPORTS ACCIDENT RATE DOWN

Oahu's traffic situation has improved some this year over last year, Governor Quinn said yesterday — but not enough.

The Governor issued a statement on traffic emergency yesterday, exactly two months after he declared a state of emergency on Oahu's streets and highways, March 29.

His statement yesterday was a plea for motorists to assist government agencies in curbing the accident rate during the Memorial Day week end and other holidays.

In his statement, he said the number of major traffic accidents is now down 15 per cent from a year ago.

### Yagi Returns To I.L.W.U. Post

WAILUKU, Maui, May 30 —Thomas S. Yagi, Maui County I.L.W.U. division director, who suffered a heart attack on March 21, returned to work yesterday on a part-time basis after an extended vacation on Hawaii.

Yagi met last night with Jack W. Hall, union regional director at the Maui Palms Hotel.

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Star-Bulletin

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Is your car keeping you bankrupt?





An aquarium worker feeds a leathery turtle at **Shimonoseki Aquarium** which is setting the world's longevity record for that species in captivity.

— Marks 750th Day in Captivity —

## Leathery Turtle Holds World Record

SHIMONOSEKI, Yamaguchi Pref. (Kyodo) — A leathery turtle, called "osagame" in Japanese, is setting the world's longevity record for that kind of turtle in captivity, marking 750th day of life Sunday.

The turtle in Shimonoseki Aquarium in this western Japanese city has a shell length of 143 cm and weighs 200 kilograms, aquarium officials said.

Leathery turtles, the largest known kind, usually live in the Pacific and Indian oceans. They also come close to the Japanese coast, riding on warm currents, the officials said.

The carnivorous turtles, wild in character, have bumps on their shells.

A leathery turtle in Sri Lanka had the previous longevity record of 662 days, the officials said.

In Japan, a similar turtle, hatched from an egg, at the Himeji Aquarium in Hyogo Prefecture lived 137 days, they said.

Some 20 aquariums in Japan attempted to breed leathery turtles, but it was very difficult and they died within a month. The turtles do not eat on their own and sometimes hurt

themselves against walls, the officials said.

Officials at the Shimonoseki Aquarium have succeeded in training the turtle to eat however.

The turtle is in good health, eating two kilograms of **mackerel** every two days, the officials said.

Some of the visitors to the aquarium throw coins into his pool, wishing for good luck from his longevity, the officials added.

*Japan Times,  
1984 ?  
[Captured May 21, 1982]*



January 6, 1986

F/SWC2:GHB

Dr. Katherine Muzik  
Marine Biologist  
Okinawa Expo Aquarium  
Motobu-cho, Okinawa Pref.  
JAPAN 905-03

Dear Dr. Muzik:

Mr. Steven Kaiser, Reef Tank Curator at Sea Life Park, suggested that I write to you concerning my interest in learning about the leatherback turtle reported to be at the Okinawa Expo Aquarium. It is my understanding that leatherbacks are very difficult to keep in captivity. I would greatly appreciate hearing details about your experience and success with this species.

I have enclosed several reprints describing our research of sea turtles here in Hawaii. Best regards for the New Year.

Sincerely,

George H. Balazs  
Zoologist

Enclosure

cc: Balazs  
HL



January 13, 1986

George H. Balasz  
NOAA/NMFS  
Honolulu, Hawaii

Dear Dr. Balasz:

Thank you for your letter of January 6, inquiring about the leatherback turtle kept at the Okinawa Expo Aquarium.

I am very impressed by your long list of publications, and by the many helpful reprints you sent. Gokoro san! May I take the liberty of copying them for the Aquarium files here, and for marine biologists and students at the University of Maryland (Far East Division) and Kadena Base High School? Education and understanding are surely the best ways to successful protection of marine life.

Indeed, there is a leatherback turtle being kept here. She was captured November 20, 1984, in a teichi-ami (set-net) at Kin Bay (southeast Okinawa, 26°27'N; 127°55'E). At capture she weighed 110 kg, and had a carapce length of 105. Today her remeasured CL is 108cm. She eats squid (2 kg/day); she began to eat on her own on April 16, 1985, after 148 days in captivity. She has been kept here 420 days.

The keeping tank is made of soft blue vinyl, measuring 3m X 2m X 70cm deep, and supplied with fresh filtered sea water, recycled once per hour.

This leatherback is not shown to the general public.

Two other aquaria in Japan are keeping leatherbacks. I suggest you write directly to them for details:

Mr. Y. Murakami, Director  
Shimonoseki Aquarium  
Shimonoseki City  
Yamaguchi Ken, Japan 752

Director  
Minami Chita Beach Land  
Aichi Ken Chita Gun  
Japan 470-32

Sincerely yours,

*Katherine Muzik*  
Katherine Muzik

P.S. My greetings to  
Jim Maragos San!

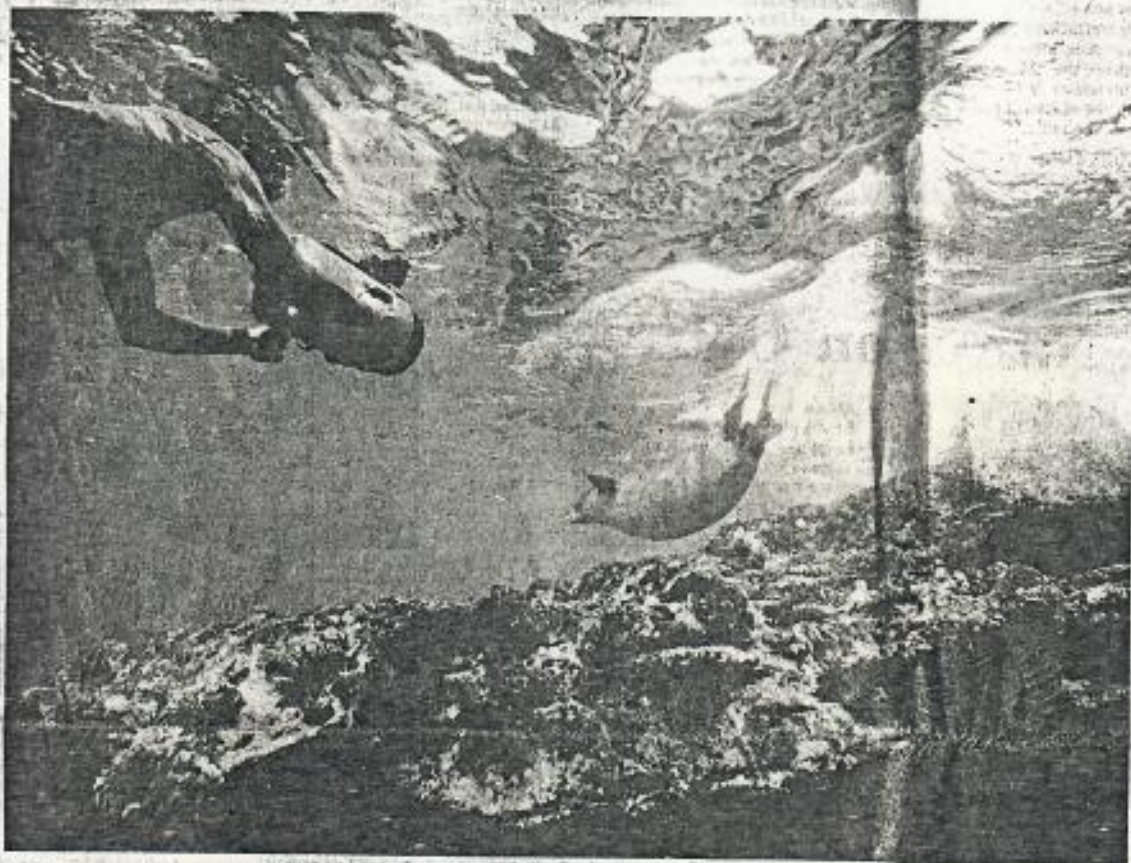


# The Garden Isle

SUNDAY, JULY 27, 1986

LIHU'E, KAUA'I, HAWAII

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NICK CALAYIANIS filming the rare Monk Seal in Kaua'i waters.

(Photo by Niki Konstantinou)

## Monk seals filmed in Kaua'i waters

One of the world's top underwater cinematographers relished a Kaua'i treat this week when he captured Monk Seals playing in waters off Ni'ihau.

Nick Calayianis, who has been featured in the Kaua'i Underwater Film Festival, and is best known for his National Geographic work, was diving with Niki Konstantinou, owner of Sea Sage Diving Center in Kapa'a. They were filming Kaua'i's reefs and sealife for DeRobert Bloom and J.J. of Ali'i Enterprises who produce films to promote Kaua'i tourism and videos for visitors to take home.

Calayianis and Konstantinou said they believe they are the first to have filmed the rare Monk Seal underwater.

Calayianis said this dive trip, which featured carpets of undisturbed, living reef off Ni'ihau, gave him a taste for the excellent diving that can be found in Hawaii.

Calayianis was the cinematographer for the "Quest for the Atocha," a recent National Geographic film about the biggest treasure find of all time -- Mel Fisher's 16-year quest for the

"Mother Lode" left on the sea floor when a fleet of Spanish ships sank in 1622 off Key West, Fla.

The film was named the best documentary of the year at the Houston International Film Festival.

Since Calayianis kept a daily log of his experiences with the Atocha, he was solicited to work on a follow-up, 2-hour movie, called "Dreams of Gold." It will be shown on CBS television this Fall and involved Calayianis as the director of the actors underwater, with Cliff Robertson playing Mel and Laureta Swit, who played "Hot Lips" on MASH.

Before this film is shown, however, Calayianis will have started work on a new production. To profile the work of marine biologist Sylvia Earle, he'll drive a deep-sea roving, one-man submersible to a depth of 5,000 feet to film dark, underwater world of the sea floor in the Bahamas.

After that, he'll teach an underwater cinematography course for Nikon in the Dutch West Indies, before returning to his home in Maryland and perhaps another trip to Kaua'i.





Advertiser photo by Bruce Asato

William Gilmartin, right, pets the seal's head after the anesthesia is administered. Behind Gilmartin is Dr. Ray Berringer.

PRESCHOOL STORY TIME  
age 3-5 yrs, 11 a.m., Nov. 25, McCully-Moore Library.  
Free. Call 945-1400

volunteers



# Surgeon, vet fix up monk seal, but it's unlikely to be freed

By Robert Hollis  
Advertiser Staff Writer

HONO SB & ADV.

11/23/86

A specialist in oral and facial surgery assisted by a Kailua veterinarian yesterday performed reconstructive surgery on the torn jaw of a rare Hawaiian monk seal at Oahu's Sea Life Park.

"Everything is patched up," said William Gilmartin, leader of the Marine Mammals and Endangered Species Program of the National Marine Fisheries Service. Although the animal has a "very sore jaw," the adult male is expected to survive, he said.

But because so many of his teeth were torn away when the animal tangled with what was believed to be a boat propeller, it is unlikely that he will be returned to the wild, Gilmartin said.

After 70 minutes of surgery — believed to be the first ever performed on a monk seal — Gilmartin said the mammal was sleeping late yesterday on a deck next to a pool in an isolation pen at Sea Life Park. Antibiotics are being administered to prevent infection, Gilmartin said.

The caretakers have affectionately named the seal "Jaws." It is 6 feet long and weighs 350 pounds.

The operation was done by Dr. Ray Berringer, a dentist who specializes in oral and facial sur-

gery. He was assisted by Dr. Robert Morris, a Kailua veterinarian at the Makai Animal Clinic.

Queen's Medical Center provided most of the medical supplies for the surgery.

Morris said Friday that the front part of the seal's lower jaw was apparently severed by a propeller. The seal was found Tuesday on a beach near the Sheraton Waikoloa Hotel northwest of Kailua-Kona on the Big Island, Gilmartin said.

"We learned quite a bit in doing this" surgery, Gilmartin said. It was the first time, for example, that a monk seal has been anesthetized using gas. "The animal was amazingly stable during surgery," he said.

A major problem facing the seal's caretakers now is getting it to eat. Even healthy seals and porpoises will initially refuse food when first placed in captivity, Gilmartin said. The problem is compounded somewhat by the seal's sore jaw.

The seal also suffered deep slashes in a line down its chest and abdomen, Gilmartin said. The cuts were cleaned and are expected to heal naturally, as do more severe shark bites seen in monk seals in the wild.

Hawaiian monk seals are protected by the Federal Endangered Species Act and Marine Mammal Protection Act. There are about 1,500 left in Hawaiian waters.

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9 a.m. to 5 p.m.

Closed Thanksgiving Day and Christmas Day

Adult admission: \$1.50 donation

16 years and under: FREE



**THE WAIKIKI AQUARIUM**

2777 Kalakaua Avenue

Honolulu, Hawaii 96815

Telephone: (808) 923-9741

The Waikiki Aquarium is accredited by the American Association of Zoological Parks and Aquariums and receives support from the Institute of Museum Services.

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*The Aquarium is a world of many worlds.*

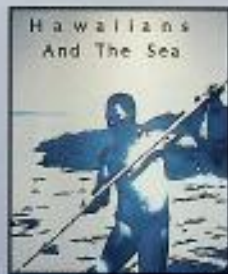
You will see rare Hawaiian monk seals and the magnificent chambered nautilus, living corals, and the countless creatures that are part of their ecosystems. And you can discover them all without getting wet!



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Have you ever seen a Humuhumunukunukuapua'a? Or been nose-to-nose with a shark? Then, you're in for some real excitement and fun!





Hawaiians  
And The Sea

also be arranged.

**Additional displays:** One of the Aquarium's finest exhibits "Hawaiians and the Sea," is a highly acclaimed collection of artifacts, etchings, and scale models illustrating the ocean's role in Hawaii's early culture. Another favorite attraction is just outside. Our entire grounds are landscaped in lovely native Hawaiian coastal flora.

**Explore at your leisure.**

Descriptive displays are included throughout our galleries. Self-guided audio tours are available too, using the By-Word system. Or, by appointment, personal tours for groups can

**More than a fancy fish bowl.**

Behind the scenes the Waikiki Aquarium is a major research facility associated with the University of Hawaii. It is also an excellent marine education center, a notable museum, and a Honolulu landmark for more than 80 years.



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