

SEA TURTLE REHABILITATION PROTOCOL FOR THE SOUND OF JURA, UNITED KINGDOM

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LOCATION

Sound of Jura, also known as the Isle of Jura

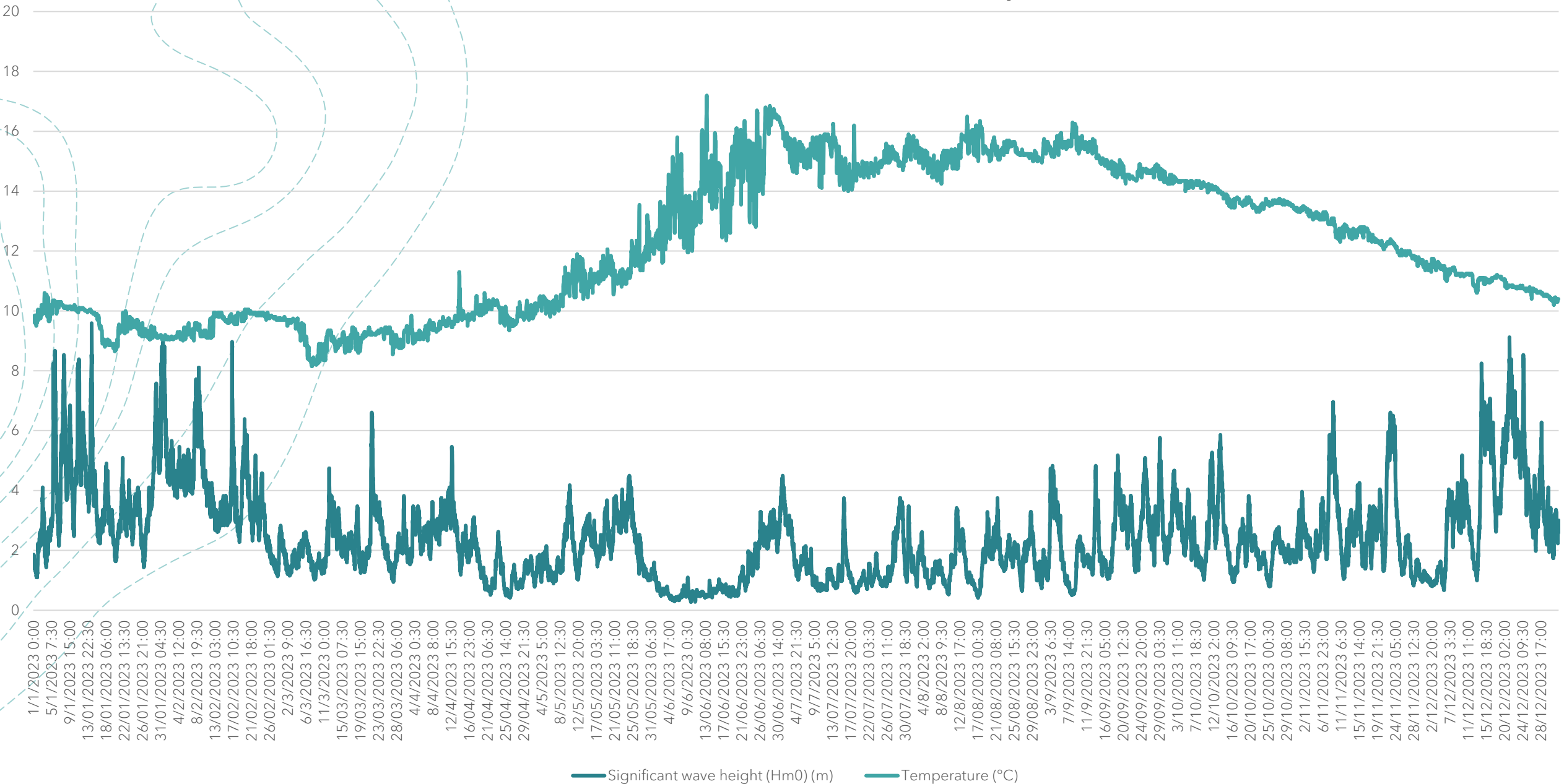
Corran Sands	Sandy
Glengarrisdale Bay	Rocky
Kilmory Beach	Sandy and Rocky, Igneous Rock Formations
Lowlandman's Bay	Rocky
Machrihanish Beach	Sandy
Westport Beach	Sandy Vegetation

Geography of local beaches



Temperature and Wave Height of the Inner Seas of the West Coast of Scotland

Blackstone Wave-net Site Buoy



SPECIES OF SEA TURTLES IN THE AREA AND UNIQUE TAXONOMIC TRAITS

- The main species that you will see is Leatherback Sea turtles due to their higher tolerance of cold waters
- There is a chance that Loggerhead, Kemp's Ridley, and Green sea turtles may appear but that is a greater cause for concern due to their higher susceptibility of becoming cold-stunted
- Across all encounters, almost all of them will be juveniles or adults, none will be hatchlings as no sea turtle species nests in the area

LEATHERBACK SEA TURTLE



Turtle Island Restoration Network

Small white speckles across body and shell, black body and shell with protruding vertical lines. Under the shell is a white or pale pink, the Leatherback is a scaleless sea turtle and the largest at 5-6ft and 750-1,000lbs (NOAA)

KEMP'S RIDLEY SEA TURTLE (NOAA)



Dark prefrontal scales, slightly hooked beak, and gray and or green shell with a pale bottom. Kemp's Ridley Sea Turtles are 70-100 lbs and 2ft. The shell is a similar width to its length and has a slightly jagged ridge along its spine (NOAA).

LOGGERHEAD SEA TURTLE (BLUE REEF AQUARIUM)



Large brown prefrontal scales, brown heart-shaped shell with few coloration changes, and tan skin. Loggerhead Sea Turtles weigh 200-350lbs and grow to 2.5-3.5ft (NOAA).

GREEN SEA TURTLE (NOAA)



Dark green/brown speckled prefrontal scales, same speckles on olive-green, brown, or grey shell, and pale skin (NOAA). On their shells, there are 5 scutes down the middle and 4 on each side. They reach 250 to 400lbs and 3-4 feet.

CHALLENGES FOR SEA TURTLES IN THE AREA

- Entanglement
- Cold-Stunting
- Marine Vehicular Trauma
- Buoyancy Syndrome



SYMPTOMS

- Lethargy
- Indigestion or Malabsorption
- Pulmonary damage
- Gastrointestinal Damage
- Integumentary System Damage
- Respiratory, fungal, bacterial infections

REMEDICATION PLAN: TRIAGE OUTLINE

0. Sanitize

1. Take vitals, heavy attention on heart rate and temperature
2. Observe Integumentary System for Exterior Trauma, Head->Throat->Carapace->Flippers->Tail
3. Eyes and Nares
4. Beak, Mouth, Throat, Papillae
5. Neck, Vertebrate
6. In-depth examination of cardiopulmonary system state via ultrasound

7. X-ray and ultrasound for musculoskeletal trauma, arterial doppler, extremities, and other soft tissue growths, injuries, or illnesses

8. Assess joint mobility, muscle tone, strength, and sensitivity

9. Coelomic cavity evaluation, cloaca, tail

10. If suspected neurological condition, repeat steps 1-5 with further tests (responsiveness, sensitivity)

11. If no issues present in previous steps, observe vitals and movement in water and prioritize gradually returning the turtle to safe internal temperatures

(Norton T, Wyneken J. 2014-2015)

Cold Stunting

Symptoms:

- Lethargy
- Low internal temperature
- Respiratory, fungal, bacterial, etc. infection
- Malnourishment/

Gastrointestinal damage

- Poor buoyancy control

Treatment plan:

- Return sea turtle's internal temperature to a safe level as soon as possible without causing shock
- Supplement nutrition and hydration has needed via IV
- Treat other symptoms as needed, heavily monitor cardiopulmonary system

Fibropapillomas

Symptoms:

- Internal tumors/lesions
- External tumors/lesions
- Loss of vision
- Loss of range of motion in extremities, evolve to inability to dive or swim
- Impeded ability to eat or drink
- Difficulty excreting dependent on tumor location

Treatment plan:

- Surgical Removal for External Tumors
- Likely Euthanasia for Internal Tumors



Chronic Debilitation Syndrome

Symptoms:

- Starvation
- Severe anemia
- Malnourishment
- Lethargy

Treatment plan:

- Utilize a floating dock or house in shallow water
- Maneuver gently with extreme care
- Supplement hydration and nutrition with IV, gradually work towards solid food

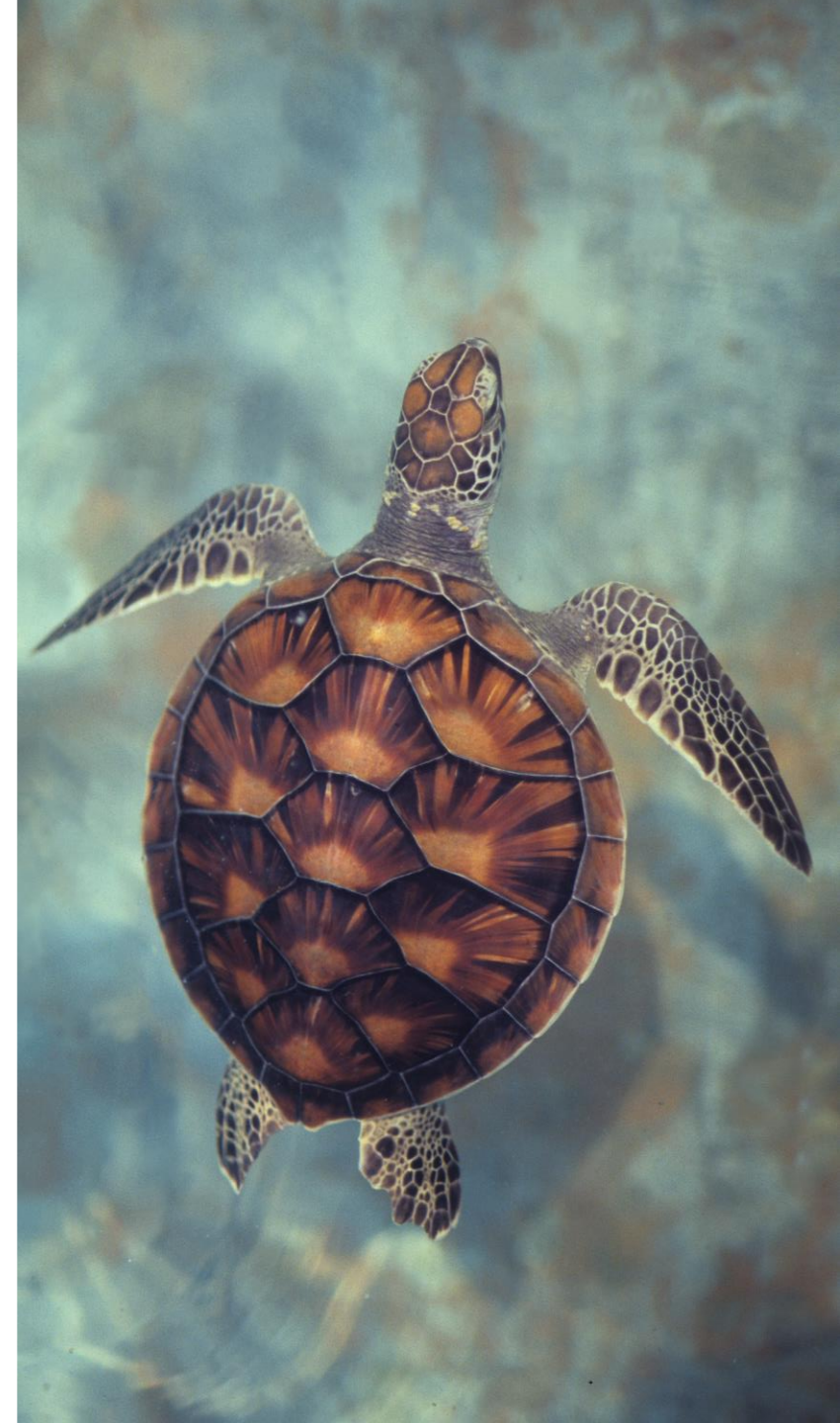
Entanglement & Integumentary Injuries

Symptoms:

- Respiratory infection
- Limited movement
- Lesions
- Lethargy

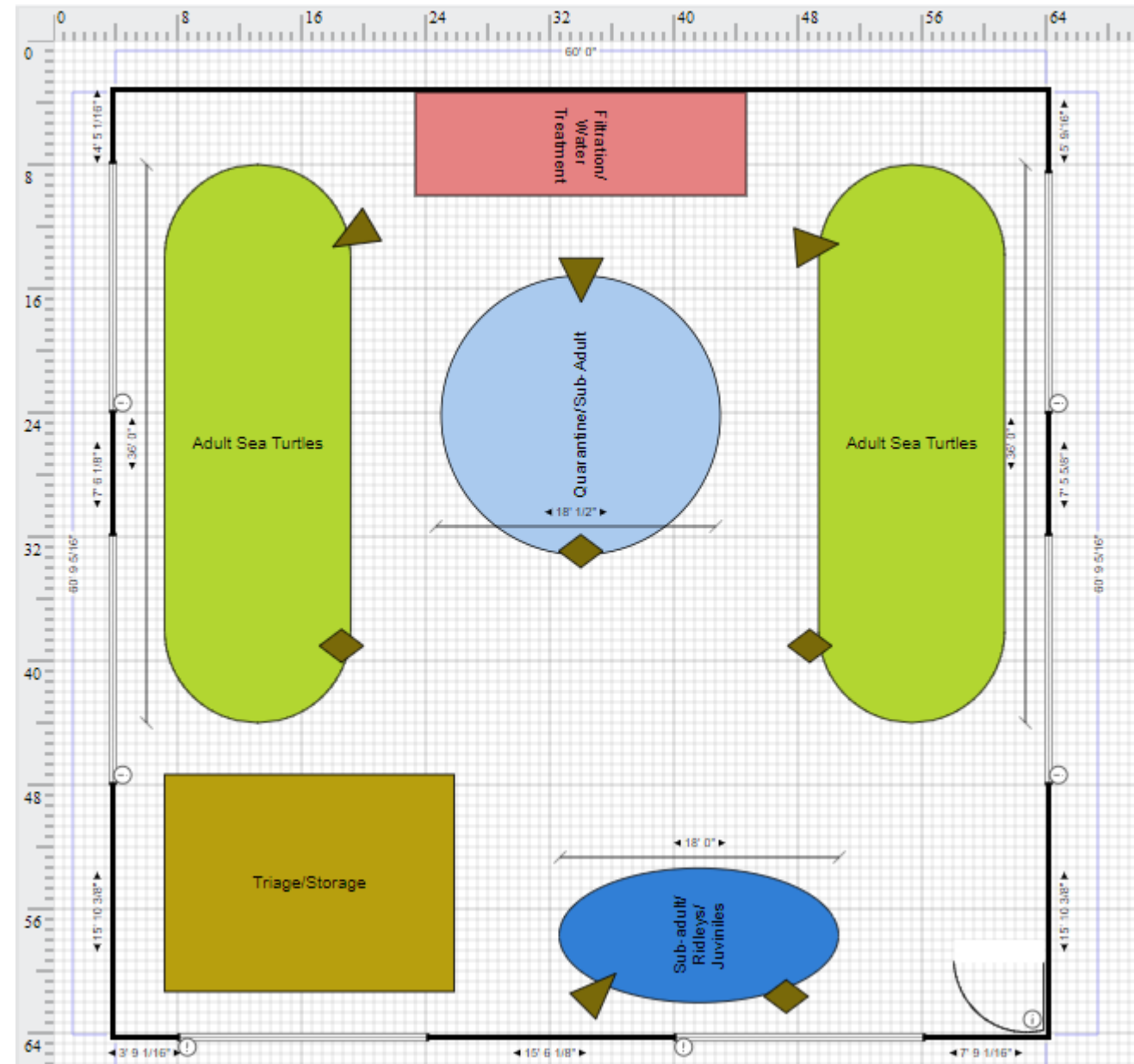
Treatment Plan:

- Dependent on entanglement severity and damage to integumentary system
- Utilize floating dock as needed
- Slowly rebuild strength
- Treat respiratory or other infections as needed
- Stabilize and correct vitals as needed



Floor plans for Various Sea Turtle Species and Facility Size Capabilities:

<p>Olive/Kemp's Ridley</p> <p>Avg. SCL: 2-2.5ft</p> <p>Avg. SCW: 2ft</p> <p>Adult tank size: 18L X 4W X 3H</p>	<p>Hawksbill</p> <p>Avg. SCL 2-3ft</p> <p>Avg. SCW 1.5-2.3ft</p> <p>Adult tank size: 27L X 5W x4H</p>	<p>Loggerhead</p> <p>Avg. SCL 2.5-3.5ft</p> <p>Avg. SCW 2-2.8ft</p> <p>Adult tank size: 32L X 6W X 4H</p>
<p>Flatback</p> <p>Avg. SCL 3.25Ft</p> <p>Avg. W 2-3Ft</p> <p>Adult tank size: 30L X 6W X 4H</p>	<p>Green</p> <p>Avg. SCL 3-4ft</p> <p>Avg. SCW 2.3-3ft</p> <p>Adult tank size: 36L X 6W X 4H</p>	<p>Leatherback:</p> <p>Avg. SCL 4-8ft</p> <p>Avg. SCW 3-5 ft</p> <p>Adult tank size: 72L X 10W X 4H</p>



SUB ADULT/SMALL ADULT

AVERAGE ADULT

LEATHERBACK/LARGE ADULT (SPECIES OUTLIERS)

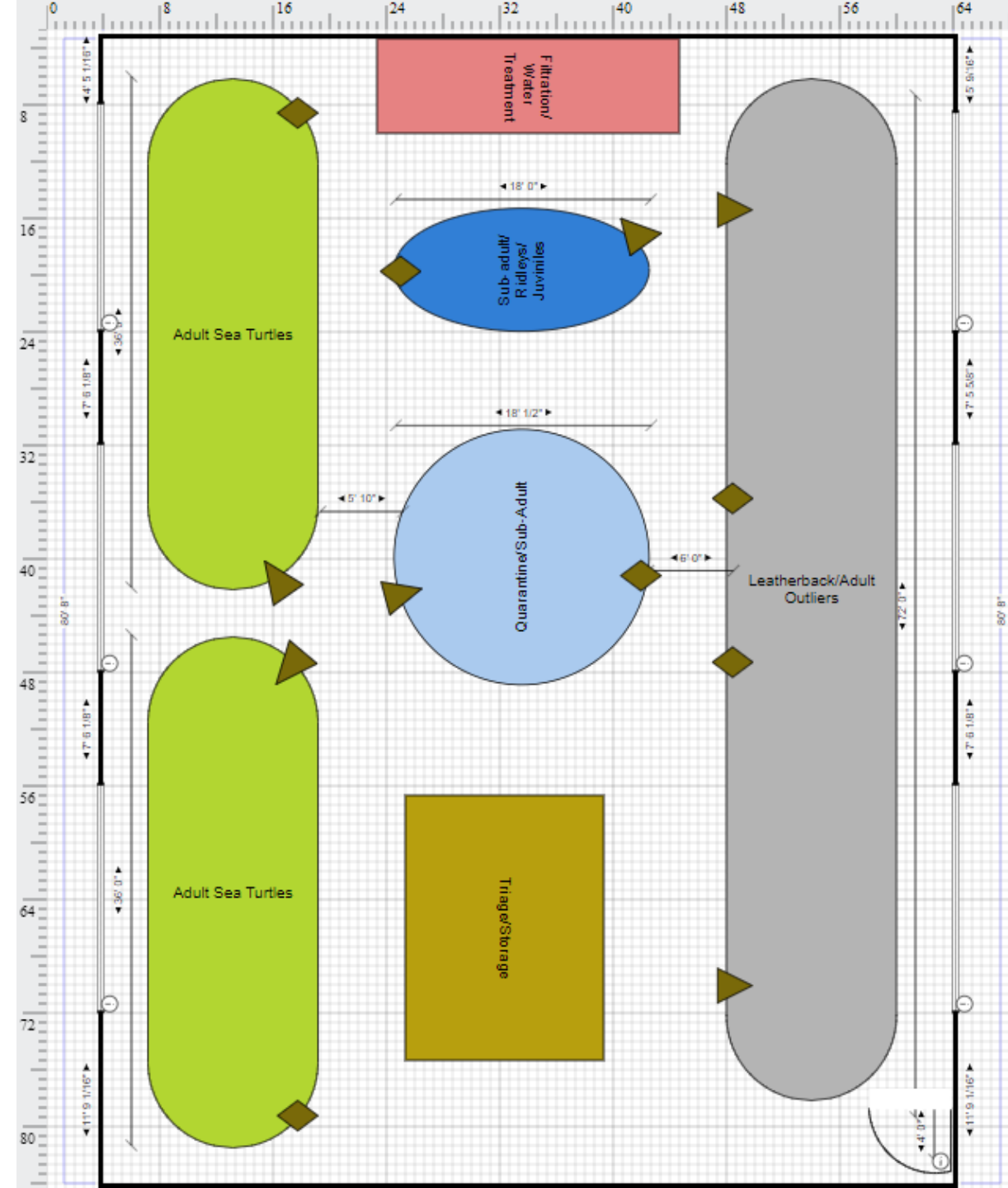
TRIAGE/STORAGE (RECTANGLE)

TRIANGLE = FILTRATION INPUT

DIAMOND = FILTRATION OUTTAKE

FILTRATION & WATER TREATMENT UNIT

- Closed or Flow-Through, preferably closed for temperature control. Facility budget dependent
- Mechanical filtration via filter system, biological filtration via nitrogen cycle and monitored bacterial and microbial communities (Mechanical is machine/equipment, biological is natural/living)
- Input Pipes are 6 Inches above tanks to allow for aeration, mesh or plastic baffle is optional to lower the strength of the current
- Temperature, heat/cold necessary to control due to sea turtles being unable to internally thermoregulate- Thermoregulated to 25 ° C, however individual tanks have water coolers and heaters as needed for illnesses or species preference
- Salinity, salt content of the water, impacts buoyancy/gravity- 20ppt-35ppt, aim for 25ppt-30ppt
- PH, acidic content of water- 7.2-8.5, aim for 7.8-8
- Dissolved oxygen, oxygen content in the water- 6-8 mg/L
- Ammonia, decomposed waste- 0
- Alkalinity, acidic - 2.5 mEq/L
- Coliform bacteria, digestive tract bacteria- Less than 1000MPN per 100 milliliters of water
- Chlorine, disinfectant- Below 1ppm



COMMUNITY AND POLITICAL POLICY TO REDUCE INJURY

- Outside of the rehabilitation center, in our community, following guidelines to respect the space of marine mammals is a must
- Boats must maintain a minimum of 100 feet from the turtle once spotted and turn off motors/propellers until the mammals returns to a safe distance
- When boating, proceed cautiously and have another person keep watch to avoid colliding with unseen animals
- Keep net fishing to a minimum, however if you must, do not leave behind any netting.
- If a sea turtle is caught, immediately call the number for your area listed by the United Kingdom & Irish turtle code sheet.
- For Scotland/Sound of Jura, call the Marine Environmental Monitoring line which is available 24/7 (Rod Penrose).
- Another way to minimize threats to sea turtles in the community is keeping your trash secure until you have docked your boat and may dispose of it properly, many sea turtles die or face complications due to digestion of pollutants or becoming entangled in them and suffocating.

THANK YOU

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Rod Penrose - data provided by the British Isles & Republic of Ireland 'TURTLE' Database Manager www.strandings.com

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