

Conservation Status of Dugongs in State of Qatar

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Regional meeting on science and mangement for Dugongs of Arbian Gulf

2 May 2022 Abu Dhabi CMS

Sea grass Distribution in Qatar

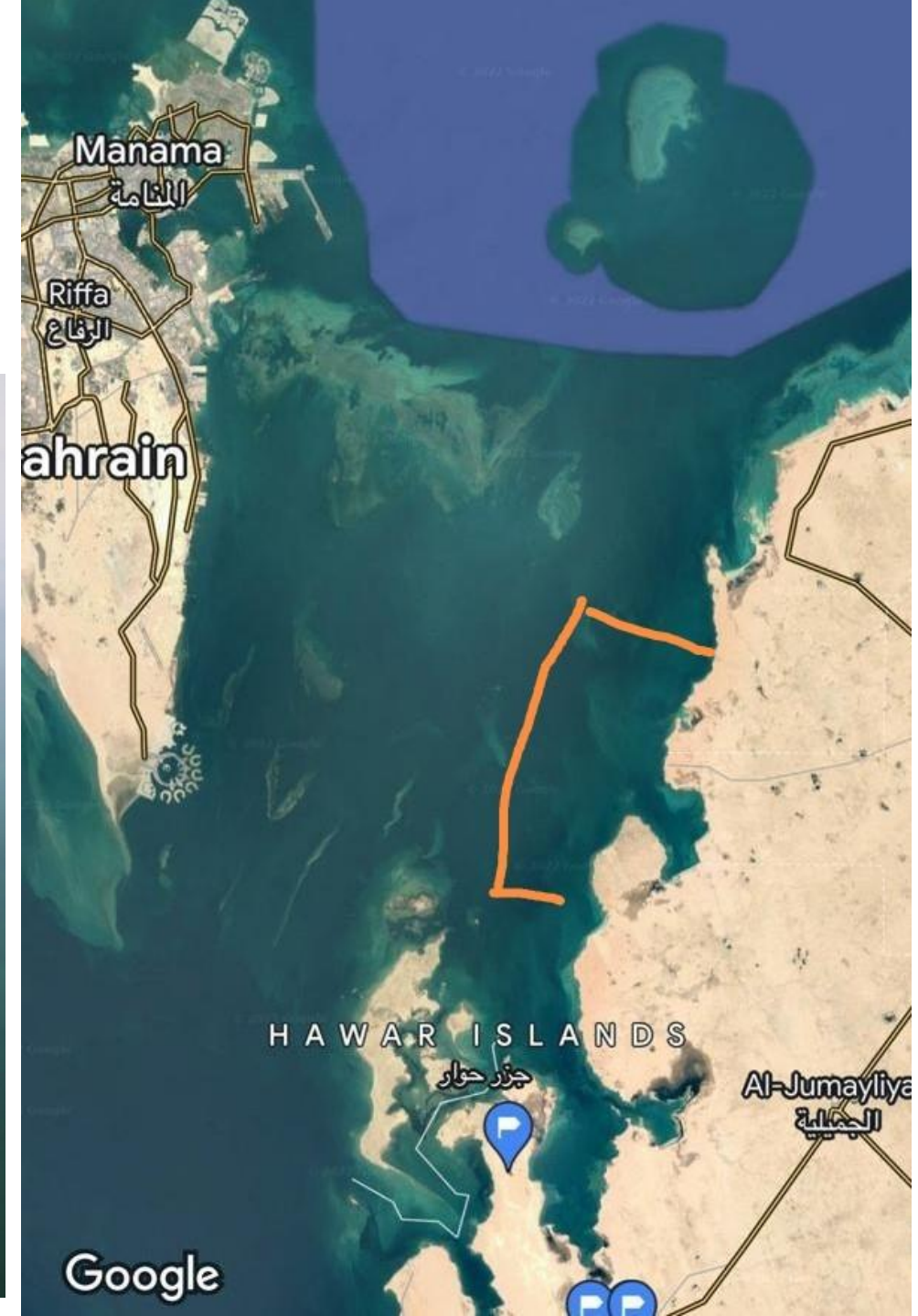


Fig. 11: Known distribution of major seagrass assemblages in the southwestern Arabian Gulf (Source: WCMC-IMAPS Seagrass database)



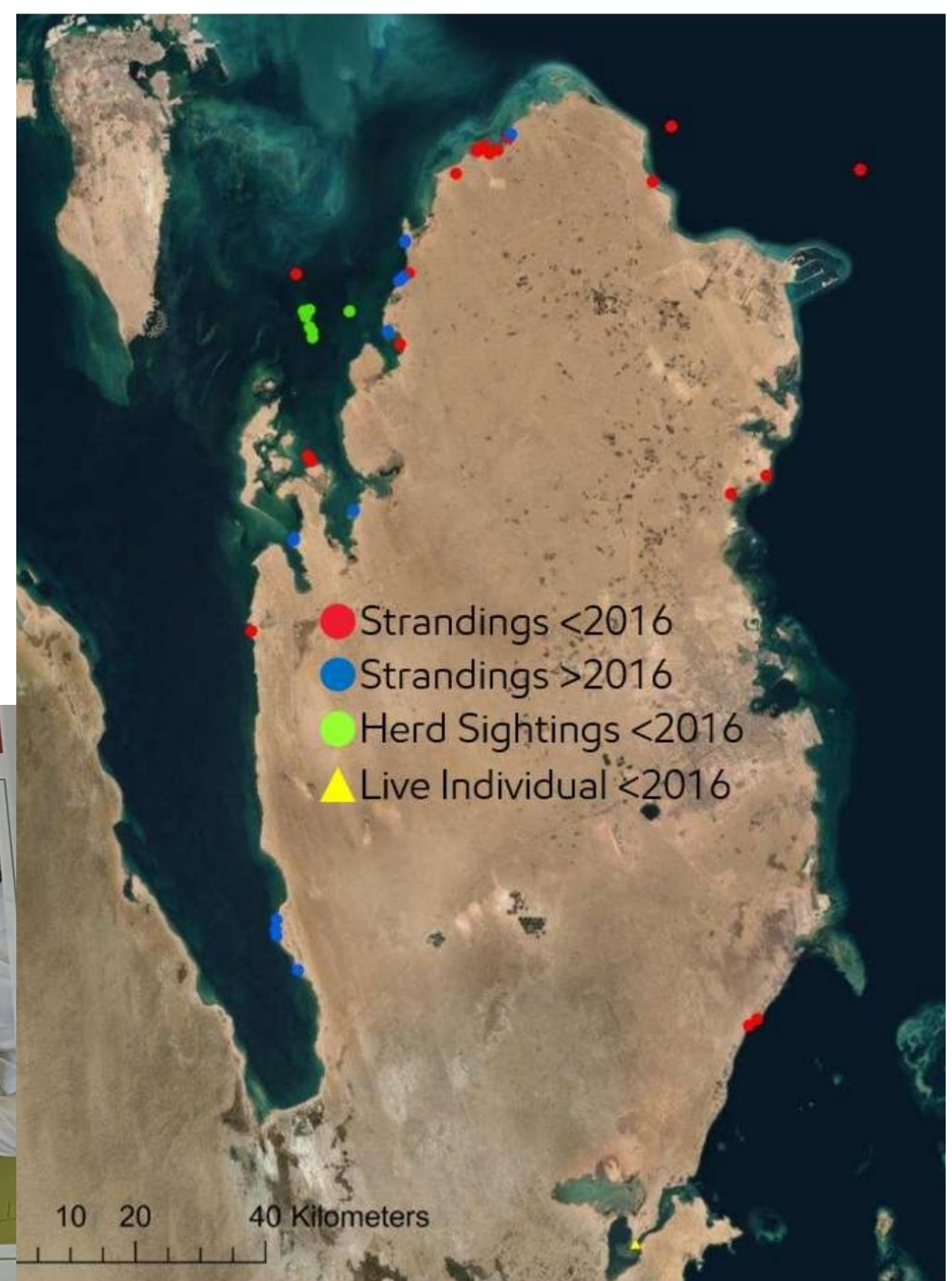
s - RIGHT: Coastal Sensitive Ecosystems
of the ICZM Plan for the State of Qatar

NW Qatar seagrass



Dugong Strandings in Qatar

2007 Nov 2 NW
 2008 Jan 3 NW, Nov 3 NW, 1 SW
 2013 1 W
 2014 1 W
 2015 2 NW, W
 2020 April 3 W, E, SE
 2021 April 1 SE
 2022 July 6 SE, Nov 1 NE
 2023 Mar 1 SE



Another dugong rescued from Khor Al Udeid area

The Ministry of Environment and Climate Change (MoECC) has rescued another dugong in co-operation with Qatari environmental activist Khalifa Omar Saleh al-Hamidi. It is the second dugong to be rescued by the ministry this month.

In a tweet, the MoECC said the dugong was found in the Khor Al Udeid Area at dawn yesterday. A specialised team from the ministry immediately transferred the baby dugong to a designated tank in Fuwairit (sea turtle project) and named him Oscar, while provided him with the necessary care to ensure his safety.

The MoECC team also treated his superficial

wounds, gave him milk and fed him under the supervision of aquatic nutritionists.

Oscar has been kept near Ocean, the dugong rescued earlier this month.

In February next year, the specialists will prepare for the release of the two dugongs into the sea, once they are capable of surviving in their natural habitats.

Ocean was rescued, also from the Khor Al Udeid area, by the MoECC team in co-operation with Qatari environmental activists al-Hamidi and Ahmed Saad al-Fayyadh al-Khalidi.

Ocean is the first such creature to be named in the region.



Oscar and Ocean with officials at the Fuwairit facility.



Government Dugong Conservation Actions

2020-2021 MME marine scientists review available existing scientific data on Qata Dugongs.

2022 MoECC prepare a **Qatar National Action Plan for Conservation and Management of Marine Resource.**

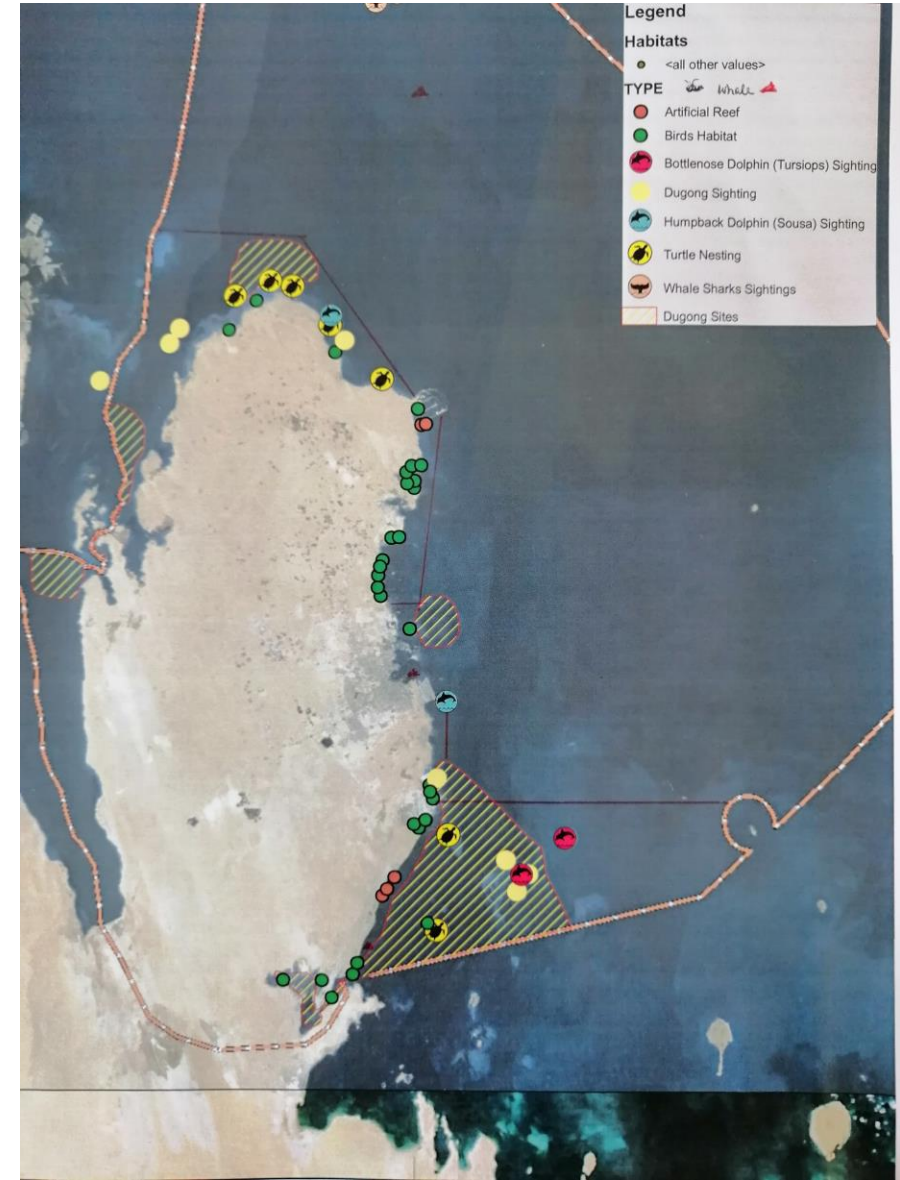
It was followed by a document **Proposal Marine Protected Areas.** There was a MPA designated for the Dugong and seagrass, the Qatar west MPA.

Between July and October 2022 MoECC **rescued** four stranded neonate dugongs.

2023 MoECC inhouse marine scientist team start to study biodiversity and **monitor human activities** and dugong and other marine life in the proposed **Qatar west MPA.**

2023 Summer MoECC marine scientific team will start field study and monitor trips to **Qatar SE** water, where neonate dugongs had been found stranded.

The MoECC is in the process of preparing a **management plan** for dugong conservation. including **new laws** to control human activities in the **MPAs** including specific rules and regulations **and a rehabilitation centre** for dugong protection in Qatar.



Qatar Government support research on Dugong

The first study on Qatar and the Gulf dugongs by A Preen in 1989 was incorporated in UNEP **2002 Action Report** listing Qatar as one of the important dugong aggregation sites. Another paper by Preen was published on 2004 on dugong and dolphins in south Arabian Gulf

Qatar Government MoE contracted out a **nation wide dugong survey in 2008** and produce a book of training material for dugong survey by Five Oceans.R Baldwin

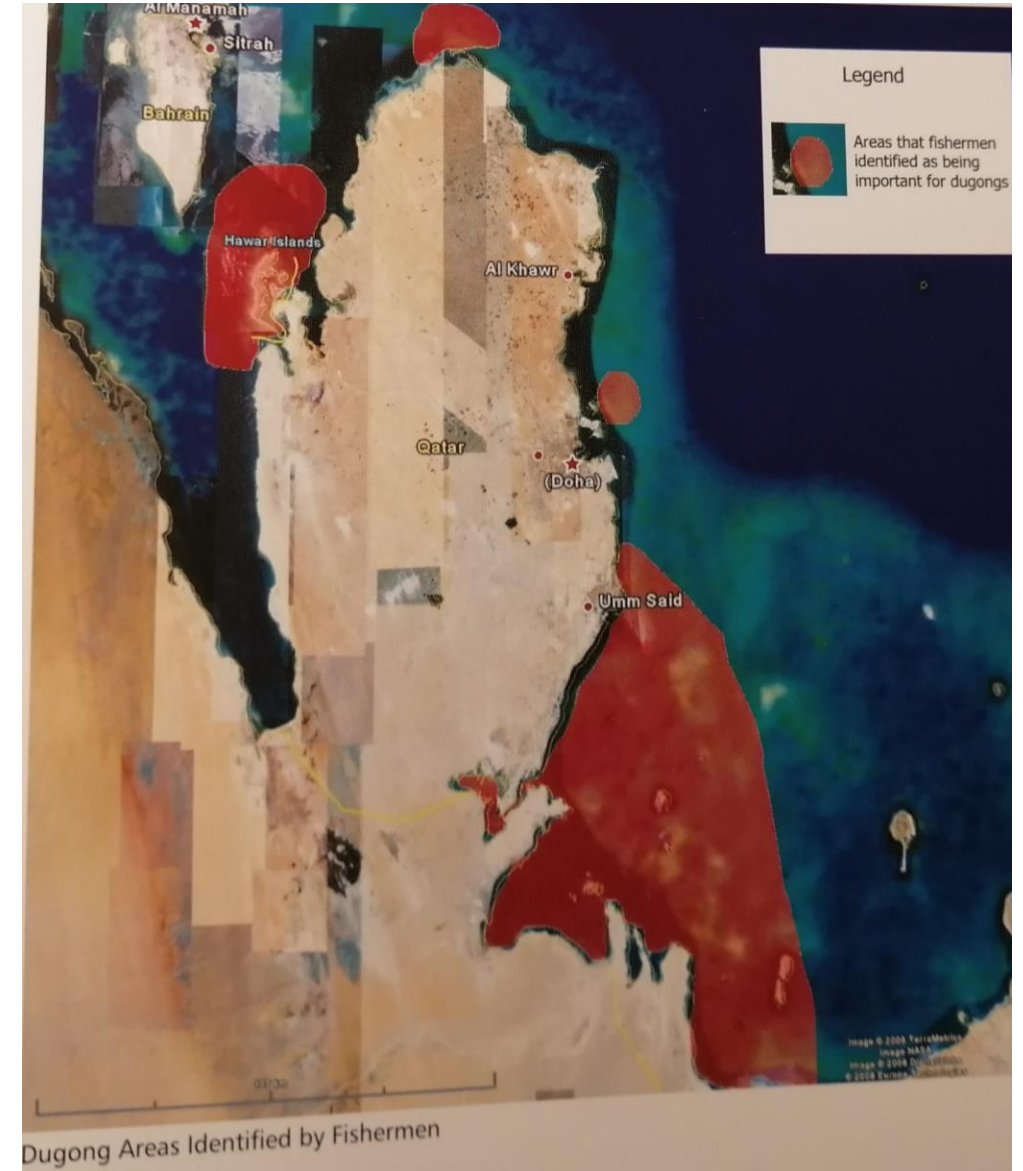
Qatar government supported a 3 year **2015-2018** study dugongs in Qatar **north-west** water by Qatar University and Texas A&M University. This was extended again to 2023 season.

2020- 2022 MME, later become Ministry of Environment and Climate Change(MoECC) started **recording strandings** of marine mammals including dugongs. From 2022 MoECC started actively monitoring, recording and managing stranded marine mammals, dead or alive.

2022 spring, 8 dead dugongs were reported on north west shores. In summer there were 6 more dugong strandings on Qatar south-east shore, 4 live were **rescued and studied** and 2 dead. Five were between 110-140cm, one 262cm dead female.

Since **2023** Feb MoECC scientists and staff had started monitoring dugong and other marine animals in the north-west waters proposed Qatar west MPA. Recording marine mammals, sea birds, other marine lives and human activities in the area, collecting data for management purpose.

The MoECC inhouse marine mammal expert will soon start to carry out initial study on dugongs in **south-east** qatar water, a **possible dugong bleeding area** in summer. That area is a potential Marine Protected Area.



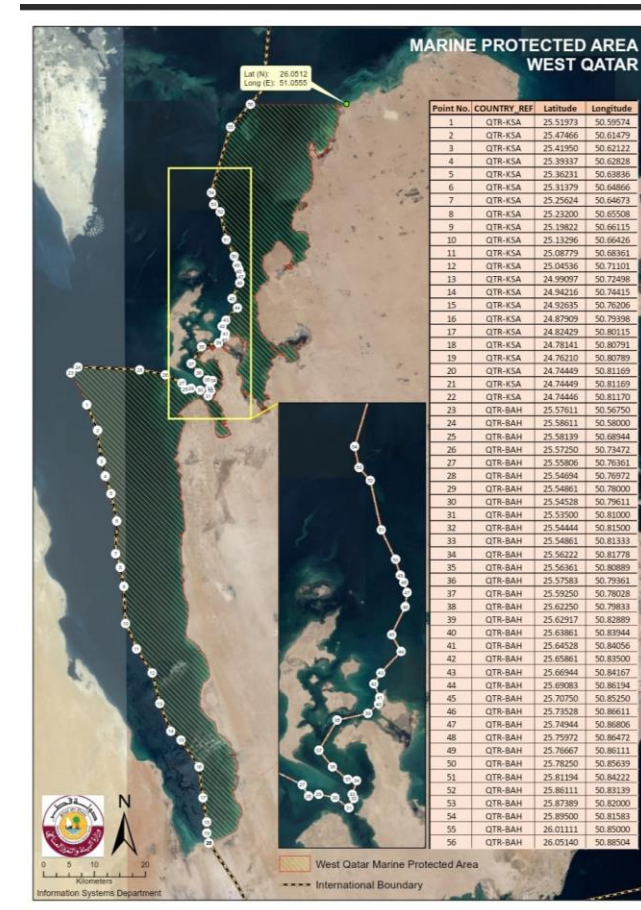
Marine Protected Area for Dugong and Sea grass

- 2022 MoECC started the process to designate an area about 1650 sq.km Qatar western water as Dugong and Seagrass marine protected area.

Dugong feeding, nursing and possibly mating activities have been reported and recorded in this area.

This Protected area covers most of Qatar western water reaching borders with Bahrain and Saudi Arabia.

It is within the Gulf of Salwa, which has been identified as Important Marine Mammal Area (IMMA) by IUCN and WCPA.



Potential breeding site for dugongs. Qatar SE

- Between end of April to End of July there had been neonate dugongs found stranded in SE shore of Qatar.

28 April 2020 A neonate with foetal folds and furs was found stranded on a beach SE Qatar. Two previous neonate dugongs were reported in that same area.

In July 2022 Four neonates with body length range from 110cm to 130cm stranded in SE beaches. High temperatures was found precede these strandings.

MoECC is hoping to set up a transboundary Marine Protected Area Management Committee with our neighbours for effective conservation of dugongs in the region.



s - RIGHT: Coastal Sensitive Ecosystems

of the ICZM Plan for the State of Qatar

Ocean was found stranded on 4th and again on 5th July at a beach SE Qatar she was taken into Fuwairit turtle hatchery. 27kg 110cm female.



Baby Dugong Food requirement

- Marine mammals usual daily food intake 5 to 10 % bodyweigh .
- Energy requirement is 50 to 80 Kcal /Kg BW.
- Ocean 27 Kg need 1350 -2700g milk a day. need 1350 -2160 Kcal per day.
- Oscar 35 Kg need 1750 -3500 g milk a day. 1750 -2800 Kcal a day .
- Oliva 40Kg need 2000-4000g milk a day 2000-3200 Kcal a day

Vodafone Qatar 64% 8:47

Composition per 100g

	Whole cow's milk ¹	GUM ¹
Energy (kJ)	274	274-289
Protein (g)	3.3	1.5-1.8
Lactose (g)	3.5	3.0-3.3
Total fat (g)	2.2	0.8-1.3
of which saturated (g)	1.3	2.0-2.2
of which unsaturated (g)	4.5	7.4-8.5
Carbohydrate (g)	0	0-1.2
Dietary Fibre (g)	43	26-30
Sodium (mg)	118	78-86
Calcium (mg)	0.03	1.2
Iron (mg)	0.4	0.9
Vitamin A (mg)	0.03	0.05-0.1
Biotin (mg)	0.23	0.11-0.14
Vitamin B6 (mg)	0.06	0.04-0.06
Vitamin B12 (µg)	0.9	0.14-0.18
Total Niacin (mg)	0.8	0.4-0.5
Vitamin E (µg)	8	12-13
Vitamin K (µg)	30	65-70
Vitamin D (µg)	Trace	1.5-1.7
Vitamin C (mg)	2	12-15

¹Cance & Widdowson Composition of Foods—updated for total fat and saturated fat from Irish composition data.
²Manufacturer's information, range based on three products from two manufacturers.

ResearchGate
 Nutritional composition of GUM and whole cow's milk | Download ...
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camel milk constituents

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The average amount of components of camel milk is **protein 3.1%; fat 3.5%; lactose 4.4%; ash 0.79%, and total solids 11.9% (11–16)**. The most important factor in camel milk is water content. The total solid content is similar to that of human milk (17).

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2704221/>
Nutritional and Therapeutic Characteristics of Camel Milk in ...

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People also ask

- What camel milk contains? ▾
- What is the main ingredient of camel? ▾

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Overview Nutrition facts Products

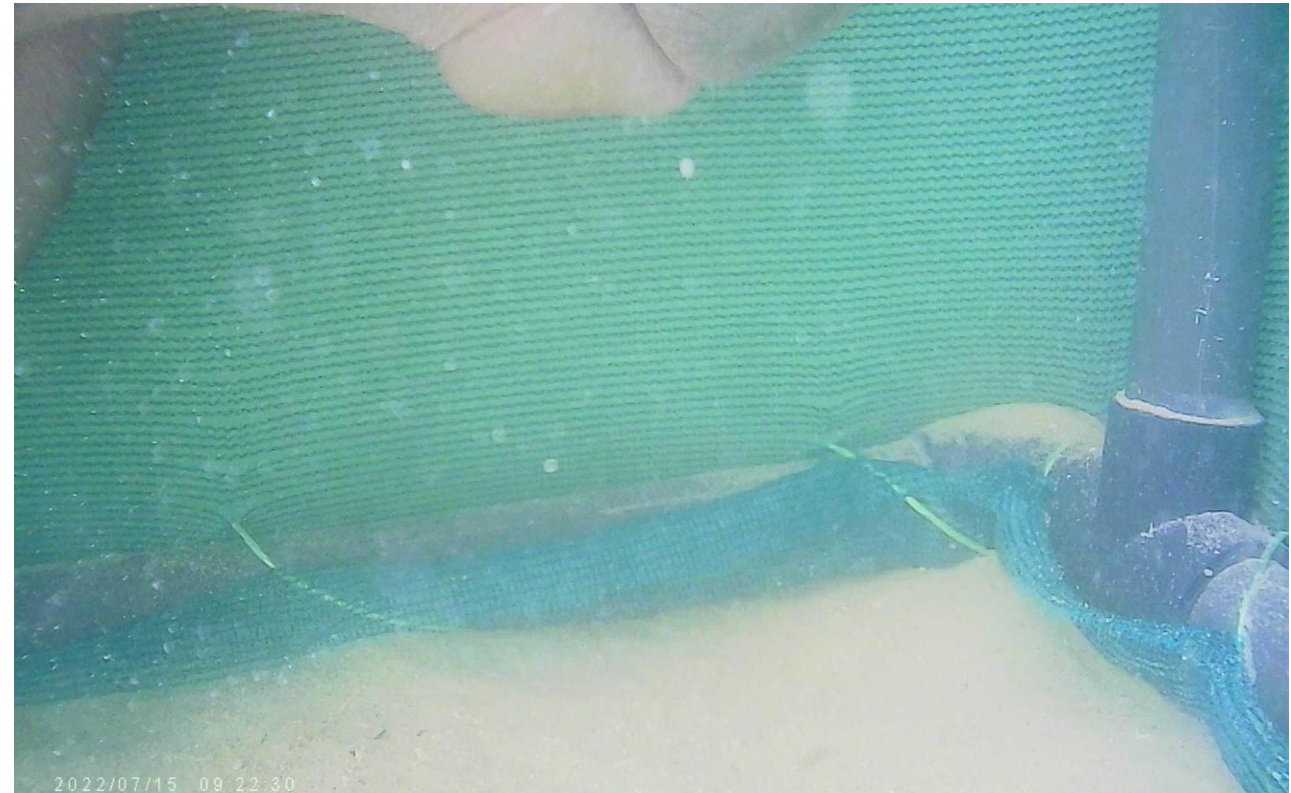
Goat milk
 Sources include: [USDA](#)

Amount Per 100 grams ▾

	% Daily Value*
Calories 69	
Total Fat 4.1 g	6%
Saturated fat 2.7 g	13%
Cholesterol 11 mg	3%
Sodium 50 mg	2%
Potassium 204 mg	5%
Total Carbohydrate 4.5 g	1%
Dietary fiber 0 g	0%
Sugar 4.5 g	
Protein 3.6 g	7%
Vitamin C 2%	Calcium 13%
Iron 0%	Vitamin D 12%
Vitamin B6 0%	Cobalamin 1%
Magnesium 3%	

*Per cent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.

Dugong behaviour observation: floating, munching seagrass, or nibbling her flippers laying on one side resting at the bottom of the pool.



Oscar 35kg 120 cm male came in on 23 July 2022



Liked by [khaledzakidiving](#) and 123 others

وستقوم وزارة البيئة والتغير المناخي خلال شهر فبراير القادم بالتحضير لإطلاق صغار أبقار البحر التي تم إنقاذها مؤخرا، بعدما يتم تقديم الرعاية اللازمة والتأكد من قدرتهم على الاعتماد على أنفسهم، حيث سيتم إعادتهم للعيش في بيئتهم الأصلية.

Next February, the Ministry of Environment and Climate Change will prepare for the release of the recently rescued dugongs, after the necessary care has been provided and they are able to rely on themselves, as they will be returned to live in their original environment.

Oliva female 40kg 130 cm found 27July 22
A Dead male 110cm found 21July 22



ocean_dugon

سيلين



Status of each dugong

Ocean initial body weight is 27 Kg on 05.07.22

weight 22 Kg on 31.07.22 lost 5Kg/19% in 26 days.

Oscar with many scars weight 35 Kg on 23.07.22

weight 26 Kg on 31.07.22 lost 9 Kg /25% in 8 days.

Oliva estimated weight 45 Kg on 27.07.22

weight 38 Kg /5% in 4 days.

Possible reasons:

1. High water temperature and injury cause increase metabolic rate which demand high energy.
2. Insufficient nutrient provided by bottle feed. There is spillage during each feed. Amount provided is not all absorbed. Tube feed ensure all nutrients reach the stomach but need vet doctor to administer.
3. The terrestrial mammal milk provided is not as nutritious as marine mammal milk. Protein and fat in cow milk is only 1/3 and 1/10 that of seal milk.
4. Insufficient staff and facility to provide night time feed. There is no light after dark in hatchery.



Formula milk to provide high protein and fat milk for baby dugong .

This formula powder milk contains 20% protein and 15% fat provide high body building and high energy requirement by weak baby dugongs and other mammals.

This contain 7 x protein in cow milk., and almost 5 x fat in cow milk. It can be used for baby dugongs.



Original Fohlenmilch
The energy drink for emergencies.

Disease or death of a mother mare sometimes makes it necessary to artificially raise a foal. The proper use of Foal Milk can make this rearing period possible without problems.

The ingredients in Foal Milk are based on the mare's milk and meet the requirements of the foal with regard to energy, protein, minerals and vitamins. Special care was placed upon the choice of protein sources. Plant protein sources (e.g. soya protein) are often the cause of diarrhoea in young animals. Therefore the use of cheap protein products was deliberately dismissed and substituted by more easily digestible skimmed milk and whey powders.

Due to its overall balanced composition Foal Milk can be used as a sole feeding product during the first weeks after birth or as a supplement for those whose dams produce insufficient milk. However, for primary immunization during the first hours after the foal's birth it is of utmost importance for the foal to receive either colostrum from a foster mare or conserved colostrum and/or let the vet administer gamma globulins.

FOR NURSING FOALS
BASED ON MARE'S MILK
FOR A HEALTHY START

Feed Recommendations Original Fohlenmilch

Mixing-Ratio	1 Liter Water + 125 g Foal Milk
Week of Age	1 2 3
Liter/Foal/Day	2-3.5 4-8 3-12
Number of Daily Meals	10-12 6-8 8-8

Mixing-Ratio	1 Liter Water + 175 g Foal Milk
Week of Age	4-5 6-9 10 11-13 14-16
Liter/Foal/Day	8-10 10 8 4 4
Number of Daily Meals	4-8 4 4 3 4

Composition
Skim milk powder, Whey powder, Vegetable fat/oil (Palm / coconut / raps), Whey powder, partly sugar removed, Wheat flour, Powdered egg, rich in immunoglobulin, Raw lecithine, Vegetable oil acidity (palm)

Ingredients

Crude Protein	20.0 %
Crude Fat	15.0 %
Crude Fibre	0.1 %
Crude Ash	9.0 %
Calcium	1.0 %
Phosphorus	0.6 %
Sodium	0.4 %
Magnesium	0.3 %
Lysine	1.8 %

Additives per kg

Vitamin A	50,000 i.E.
Vitamin D3	5,000 i.E.
Vitamin E	300 mg
Choline Chloride	320 mg
Vitamin C	500 mg
Vitamin B1	30 mg
Vitamin B2	30 mg
Vitamin B6	30 mg
Vitamin B12	12 µg
Iron*	180 mg
Copper*	10 mg
Manganese*	40 mg
Zinc*	75 mg
Selenium**	0.25 mg
Iodine	2 mg

*organically bound
**partly organically bound

It is important to consider the following when preparing and giving Fohlenmilch:

The intake of colostrum is essential in the first hours after birth. Fohlenmilch cannot replace colostrum. It is required to slowly change from colostrum to Höveler Fohlenmilch. The feeding plan is supposed to offer an orientation. The amount of Fohlenmilch to be fed has to be adapted to the individual demands of the individual foal.

Höveler terabb-FS 16 or Höveler Fohlenmilchsi should be offered from the second week of life on next to the trough. The number of troughs per day is dependent on the individual condition and age of the foal. The amount of Fohlenmilch is dependent on the intake of Fohlenmilchsi/Fohlenpellet from the sixth week of life on.

Temperature to mix: 40 – 45 °C
Temperature to feed: 38 – 40 °C

Packing unit:
25 kg bag Article No. 4808241
5 kg bucket Article No. 4808242

Recommendation for Ocean

Ocean initial weight was 27Kg at 5th July. On 31 July she weight 22Kg. She lost 5Kg or 19% Over 26 days. The ministry staff managed to save her from dehydration and sun stroke with bottle feed during this time. She would have die of dehydration and suffocation, if she were left on the beach she certainly would have follow the same fate as the dead dugong that was found in 21st July.

There were signs of movement near the **dead dugong** which was found dead later in the morning exposed to the sun at high temperature. There is no injury or sign of net entanglement. He was likely to be die of dehydration and lack of oxygen to the brain after struggling on the beach for some time before discovered .

Ocean was fed on high protein and high fat formular milk available from a pharmacy from 31 July. With regular supervision from a veterinary doctor, she should be able to recover from malnutrition. Provided there is sufficient dedicated trained staff providing sufficient high calorie meal she can be kept for over longer time until she can wean and adapted to eat sea grass. She has already started munching seagrass, though in small quantities.



Recommendations for treatment for Oliva and Oscar

Because of rapid weight lost in a short time, lost 9 Kg or 25% body weight in 8 days. Oscar is at high risk of reduction in body mass and its immune system. His wounds are not healing and possible inflicted infection and health state deteriorate because of possible cross infection from baby sea turtle by mixing the two kinds of animal in one big pool though separated by nylon mess net.

He should be **released** with Oliva. They are very close since Oliva's arrival.

Oliva has not been eating and refuse to be tube fed. She has lost 5% of her body weight in just 4 days. She is too powerful to be hold down to be fed either by bottle or tube. She already eat sea grass and vegetable.

Both should be released into SE offshore water in seagrass bed where other dugongs are lightly to found. Then there is a possibility for them being adopted by other female. As this is common with many species marine mammals. She can keep Oscar company and encourage him to start eating seagrass. Dugongs are social animals. In case Oliva cannot find other dugongs when she is released then Oscar is with her she would noy feel loner. Oscar wounds will heal faster with clean oxygen riched offshore sea water.



We have save the stranded dugongs death from dehydration and sun stroke, time to release back to sea.

We have learned valuable experience to handle future dugong strandings.



Dugong Neonate strandings on SE Qatar shore

2022 July to October
5 neonate dugong strandings recorded.

Table 1: Dugong calves stranded alive and treated during July 2022.

Dugong	Date	Length (cm)	Weight (Kg)
1.Ocean	5 July22	110	28
	31 July	110	22-munch seagrass
	4 Aug	Died	
2. Oscar	23 July	120	35
	31 July		26-eat sea grass
	5 Aug	Died	
3. Olivia	27 July	130	40 Estimated
	31 July		38
	5 Aug		Return so the sea alive

Table 2: Other dugong calves stranded.

Dugong	Date	Length (cm)	Weight (Kg)
1.Found dead	21 July22	110	27
2. Found alive	13 Oct	130-150 estimated	Return so the sea alive

2020 April 28

A male neonate dugong life stranding sealine



Lessons learn from the dugong rescue operation

Baby dugongs need to be handled by **dedicated staff** . Dugongs need to be feed 5 or 6 times a day. Each feed should allow at least 3 hour interval for milk to be digested and absorbed. Daily feed quantity must be **recorded** .

Body weight has to be taken daily before the first meal. As indication of state of health and for calculation of daily food requirements by qualified staff.

Feeding equiptment has to be washed between meals. Seagrass should be introduce soon after dugong arrive to encourage its natural churning motion.

Tube feeding through syringe, **bottle with long teat**, and stomach tube had been used to rehydrate and treat severely dehydrated and undernourished baby dugongs. This require **veterinary doctor** support.

Dugongs are very sensitive to **noise**. They easily become nervous and shy to one corner of the pool. **Minium disturbance** from handlers and no unqualified person is allow to come into contact with the dugong.

Visitors can only view the dugongs from poolside.

Disinfection foot bath and hand wash to prevent carrying contamination to the pool. Dugongs should **not be mixed** with other animal in the same pool.

Pool water should be kept clean and disinfected to prevent infection and deterioration of wounds in dugongs.



Possible cause of Strandings of dugongs

Northern **wind and current** drive the dugongs into the south east water of Qatar.

High temperature in July 2022 coincide with neonate stranding incidences.



The first one was found still alive stranded early morning on 4th July, she was released back to the sea, but was found stranded again the next morning. She was taken in to care at the sea turtle hatchery. maximum air temperature reach **44°C**.

The second neonate was found dead on the beach 21st July early morning. Two days before maximum air temperature reach **45°C**. It was found too late.

The third neonate was found in the evening 23rd July that day air temperature reached **43°C**.

The fourth one was found early morning of 27th the previous day temperature reach **43°C**.

Jet skis and motor boats were seen speeding in the water off the stranding areas in Sea line and Khor Al Adiad. These might have cause the injuries and death to the dugongs.

3	4	5	6	7	8	9
44°	43°	41°	43°	39°	38°	37°
36°	34°	30°	32°	33°	33°	33°
10	11	12	13	14	15	16
41°	38°	38°	43°	42°	40°	41°
33°	32°	33°	34°	31°	33°	33°
17	18	19	20	21	22	23
41°	44°	45°	39°	39°	40°	43°
34°	34°	34°	33°	34°	33°	33°
24	25	26	27	28	29	30
42°	40°	43°	36°	34°	36°	37°
32°	32°	34°	33°	27°	32°	33°
31	1	2	3	4	5	6
						
37°	37°	39°	41°	42°	40°	40°
33°	33°	33°	34°	34°	34°	34°

Marine mammal milk

Marine mammal fin whale and seal milk is much more nutritional than terrestrial mammal milk.

Protein 10-13% is 4 time of cow milk 3.4%.

Fat 31-33% is 10 times of cow milk 3.1%.

Lactose 0.3 -1.4% less than 4.7% in cow milk.

Minerals 0.7 - 1.4 % compare to 0.7% cow.

Hence baby dugong should not be kept for long period in captivity. Unless special milk can be provided.

Water content :

Measuring method⁹⁾¹⁰⁾—The whale milk was mixed with refined white sand and dried by air bath of 98–100°C. The amount of the decrease in weight was made to represent the water content, which was expressed in %.

The water content was much less than that of the human and cow milk (Table VII) and the solid substances were about 4 times those of the human and cow milk, this naturally accounting for the creamy state of the whale milk.

Table VII.
Chemical composition (%)

	Water	Protein	Fat	Lactose	Minerals
Whale milk A	53.4	13.3	33.0	0.3	1.0
Whale milk B	55.0	12.3	31.8	0.2	0.7
Whale milk C	54.1	10.5	32.5	1.4	1.4
Human milk	87.5	1.7	3.5	7.1	0.2
Cow milk	88.1	3.4	3.1	4.7	0.7

Protein :

Measuring method¹¹⁾—Five grams of the whale milk were quantitatively measured for the total nitrogen by Kjeldahl's method, and the figure obtained by multiplying the amount of the total nitrogen by 6.38 was made to represent the amount of protein. Casein nitrogen was determined by adding 70–80 cc of water to 10 gm. of the whale milk, heating to 40–42°C., adjusting the PH to 4.5 with 1.0 cc of 10% acetic acid solution and 1.0 cc of 1 N sodium acetate solution, cooling, precipitating the casein, drying and filtrating this solution with the No. 6 Tōyō filter paper and measuring the nitrogen in the precipitate together with the filter paper by Kjeldahl's method. Noncasein nitrogen was determined by quantitatively measuring the nitrogen in 20 cc of the filtrate.

The soluble protein fractions of the whey were studied by dialyzing the filtrate of 40 cc (10gm.) of the whale milk, from which casein was removed by the same method stated above (human and cow milk was diluted to about 1:10 and the whale milk to about 1:40), in an ice room with a cellophane paper in a 50% gum arabic solution, concentrating the entire content to about 1/20 till the protein content became about 2–4% and then studying the protein fraction electrophoretically with Tiselius' apparatus.

The amount of protein was very great, being 6–8 times that of the human milk and 3–4 times that of the cow milk (Table VII/17

Action Plan for Conservation & Management of Dugongs



1. Continuous **monitor** Seagrass & **Dugong population**.
2. Public and Stakeholders Education
3. Set up **MPAs** in NW and SE waters. Control Coastal Development in these important dugong habitats: Feeding and possibly bleeding sites in Qatar.
4. **Control threats**. Oil pollution, fishing activities. Control plastic & dumping at sea.
5. Control vessel speed limits and install **propeller guards**.
6. Set up properly equipped Management Centre & **Rehabilitation Centre** for orphan and injured stranded dugongs, after treatment of wounds and rehydration should be return to area where dugong herds are likely to be found.
Training of Dugong, Seagrass and MPA management staff.
7. International & regional **co-operations**. Knowledge sharing and technique transfer.
8. Draft new **laws**, rules and regulations for management of MPAs and specific species .

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