Samadai Dolphin Sanctuary Monitoring Programme

January – December 2004

Handbook

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Why a monitoring programme in Samadai?

An experimental management phase is being implemented in Sha'ab Samadai during 2004 in order to provide a scientific basis for the setup of the future long-term management of human-dolphin interactions in the area.

The management objectives are defined as:

1. To maintain the extent of human presence in the "dolphin house" within limits that are clearly acceptable to the dolphins, and will not cause the quality of their habitat to degrade, and the dolphins' abandonment of the reef (we must keep in mind that the dolphins are using the reef **to rest**); and
2. To allow the continuation of a tourist activity involving a respectful interaction with the dolphins which is important for the local economy and which contains, if properly conducted, a high educational value having the benefit of enhancing human attention, attraction and care for the marine environment at large.

In order to determine the optimal level of human presence in the area, and to refine procedures for a sustainable tourist activity, a year-long experiment is beginning in January 2004, involving moderate human fruition under a strict management regime.

During this experimental phase it is crucial that appropriate monitoring of dolphin and human use of the reef be performed. After the experimental phase is terminated, an assessment will be made based on the data collected, to inform decisions on the track to be followed in the future.

The effectiveness of future, long-term management of human presence in Sha'ab Samadai, and therefore the continuation of the presence of the dolphins there, will depend heavily on the quality of the data collected during the Samadai Monitoring Programme. It is important to meet this challenge. By demonstrating that the presence of a few dozens of dolphins in one of the countless small reefs of the Egyptian coast can be sustainably and respectfully exploited to generate substantial revenues, a strong case is made with facts in favour of the benefits of conserving the marine environment and its biodiversity intact.

Zoning

Four management zones can be considered within Sha'ab Samadai:

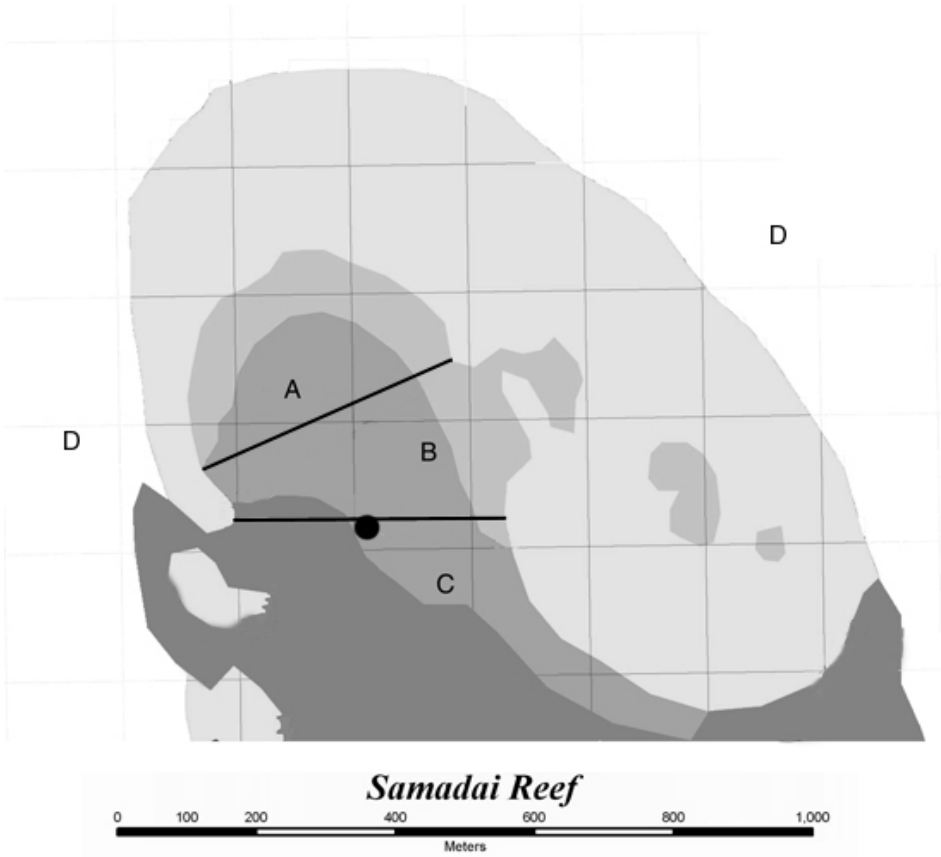
- Zone A: the core area (= "dolphin house"), strictly a no-entry zone.
- Zone B: area where entry is allowed only to snorkelers accompanied by certified guides. No boats are allowed here.
- Zone C: all the remaining deeper waters of the reef. Moving boats of all types (i.e., including inflatables) must limit movements to a minimum, and never exceed "no wake" speed. Larger boats heading for a mooring must do that expeditiously, and turn off their engines as soon as it is safe to do so. Inflatables moored must not keep their engine idling unnecessarily.
- Zone D: deep waters surrounding the reef.

Two main demarcation lines must be considered:

- the AB demarcation line – cannot be crossed by swimmers
- the BC demarcation line – cannot be crossed by boats

Exceptions can be granted by the senior ranger only in case of emergency, if human life is at risk.

The rangers vessel is moored in the black circle.



Monitoring

Checklist of equipment needed:

- binoculars (2 pairs)
- anemometer
- compass
- timer
- thermometer for water temperature
- monitoring forms A and B, clipboards, pencils, pencil sharpener, eraser
- tape recorder (desirable)

Basic procedures:

- Rangers should take their position aboard the monitoring vessel at daybreak, and start monitoring procedures no later than 7.30.
- Daily monitoring should not be terminated before 16.30.
- Important considerations: **precision** and **consistency**. With a little training, it will be easy to reach the needed level of precision for best results. This level, however, will have to be maintained until the end of the study, to ensure that the results will be meaningful.
- The feedback from the video operators and guides (i.e., trained personnel certified to accompany snorkelers in Zone B) will be essential concerning information on dolphin group sizes and the presence of young.
- With a little practice, recording the data in forms A and B in real time will not pose problems. However, in case of a rapid succession of events and limited manpower, resorting to dictating notes into a tape recorder may be very useful. In that case, **always remember to verbally note date and time at the beginning of each recording session**. Transcribe to text all recordings as soon as you possibly can, in order to have events still fresh in memory. Label and store the tape in safe place for further reference in case of need.
- Always transcribe data from forms to computer in the afternoon of the same day. Make a photocopy of all forms and store originals and copies in two different, safe places.

- Backup your data immediately after having finished entering them into the computer, every day. Leave one copy on the hard disk of the computer, and make copies on two different diskettes.

Instructions for the filling of form A (the "sampling form") – see example on p. 6

This form is used to record the situation in Sha'ab Samadai at fixed intervals (30 minutes). Only one sheet of form A is needed each day.

- Always fill in the form heading at start of operations (date and name of the person who is responsible for compiling the form).
- Set the timer to beep every half hour, at the 00 and 30 minutes of the hour.
- When the timer beeps, record the number of dolphins present in each zone, the number of swimmers present in Zone B, the number of large boats and small (i.e. with outboard engine) boats present in Zone C. Also record whether dolphins are seen in Zone D: just tick if dolphins are seen, no need for counting.
- Dolphin numbers: provide estimate based on observation from the surface only (see p. 10 for specific instructions).
- When there is only one dolphin group moving back and forth between A and B, record the situation at the time of beep (e.g., either all the dolphins are in A, or all in B, or 50% of them in A and 50% in B; in this last case, it is OK to use a 50:50 ratio regardless of what percentage is on either side of the demarcation line).

Samadai Dolphin House Monitoring Programme • Form A

Date: _17 January__ 2004

Name of compiler:
aaaaaaaa

Hour	A	B		C			D	
	n° dolphins	n° dolphins	n° swimmers	n° dolphins	n° small boats	n° large boats	dolphins in sight (Y/N)	Notes
07.30	0	0		0	1	2	x	Two large boats moored from day before.
08.00	0	0		35	2	3		Dolphins enter the reef. One large boat arrives, 2 small boats active.
08.30	35	0		0	2	4		Dolphins in Zone A. One more large boat.
09.00	0	35		0	2	4		Dolphins in Zone B.
09.30	0	35		0	2	3		One large boat leaves.
10.00	35	0	11	0	3	4		First group of snorkelers enters. Dolphins in Zone A.
10.30	35	0	22	0	3	4		Second group of snorkelers.
11.00	0	35	33	0	4	4	x	First group leaves, second is joined by two more. Dolphins in Zone B. More dolphins in sight.
11.30	35	0	44	0	5	5	x	Boats increase. More swimmers enter Zone B. Dolphins in Zone A. Dolphins outside of reef still in sight.
12.00	35	0	66	25	7	6		Second dolphin group enters reef. More boats. More swimmers in Zone B.
12.30	0	60	44	0	4	5		Second dolphin group joins first, both in Zone B.
13.00	60	0		0	3	2		Visiting time ends. Dolphins in Zone A. Some boats leave.
13.30	20	15		25	3	2		Dolphin groups splits. One remains in Zones A+B, the other moves to C.
14.00	35	0		0	0	2	x	One dolphin group in Zone A, the other leaves the reef
14.30	0	0		35	0	1		Dolphin group moves to C.
15.00	0	0		0	0	1	x	All dolphins outside of reef. Only one large boat stays.
15.30	0	0		0	0	1		
16.00	0	0		0	0	1		
16.30	0	0		0	0	1		End observations.

Instructions for the filling of form B (the "event record form") – see example on p. 9

This form is used to record in chronological order all the relevant events and environmental conditions in Sha'ab Samadai, whenever events occur. Changes in environmental conditions are to be considered events. Use as many sheets per day as it is necessary.

- Always fill in the form heading at start of operations (date, list of all team members, name of the person who is responsible for compiling the form).
- Page numbers: mark the number of each page and how many pages there are for any particular day. Example: in a day in which three sheets have been used, the first page will be marked: "Page 1 of 3", the second: "Page 2 of 3", etc.
- Time. Write here the exact time (hh-mm) the event refers to. **There must be a time for all entries.**
- **Environmental variables** (wind, clouds, temperature): to be recorded at the beginning of the observations, and thereafter only when any of the conditions changes.
    - Wind direction: to be recorded according to standard procedure (e.g., N, NE, NNE), using the compass and noting in what direction is pointing the vessel when moored from the bow. Do not record again wind direction unless it has changed.
    - Wind speed: to be measured with the anemometer in m/s. Do not record again wind speed unless it has changed.
    - Cloud cover: estimate cloud cover in eights (i.e., 0/8 for a sky completely clear, 8/8 for a sky completely overcast). Do not record again cloud cover unless it has changed.
    - Water temperature: measure only once a day, always in the same spot, same time, same procedure, possibly at beginning of operations.
- **Dolphins**:
    - When dolphins first appear, if in Zone D just note this in the 'Event' column with the corresponding time. If they are first seen in either Zone C, B or A, in addition to entries in the 'Event' and 'time' columns, mark also their estimated number.
    - Make a new entry every time:

        - a dolphin group transits from one zone to the other (**this is particularly important when dolphins move across the AB demarcation line**); to facilitate the task, the only entries needed when this happens are: time, and dolph/Zone symbol (A to D; see example on page 9).
        - a dolphin group splits into two, or two groups merge into one;
        - something unusual or noteworthy (e.g., sudden increase in swimming speed, beginning of aerial behaviour).
    - If the dolphin group splits into two or more subgroups, record this as an event; name subgroups with letters (a, b, etc.), and describe their movements in the normal way.
    - In the 'n° surface' column record the estimated group size of the dolphins as it can be inferred from the observation platform in air. For methods of estimating dolphin group size, see instructions on p. 10. Given that the group size is likely to remain the same throughout the time the dolphins spend in the reef, you can refine this number if you get better counting opportunities during the course of the sighting.
    - In the 'n° u/w (=under water)' column record the dolphin group size as reported by the video operators or guides after they have been in the water in Zone B. Make sure that the numbers reported by the underwater personnel refer to the dolphin group as it was during the time to which the group size from the air refers to (this is because in different times the group composition may have changed).
    - In the 'young' column report presence/absence and numbers of newborn and calves. Adjust the data on young after consulting with the underwater personnel. For methods for detecting juveniles and newborns, see instructions on p. 11.
- **Snorkelers:** when a group of snorkelers enters Zone B, record here their number (including the guide in the count). **Remember to record as well the time (and numbers) of departure of snorkelers from Zone B.**
- **Large boats:** these include cruising boats with inboard engine. When a large boat enters Zone C, tick in this column, note the event and mark the time. Likewise, when it concludes its mooring operations stopping the engine, and when it leaves again Zone C.
- **Small boats:** these include boats with outboard engine, inflatable or not. When a small boat crosses Zone C (for example, to approach the BC demarcation line and unload or pick-up swimmers), tick in this column, note the event and mark the time.

Samadai Dolphin House Monitoring Programme • Form B

Date: 17 January 2004	Team members: aaaa, bbbb, cccc	Name of compiler: aaaaa	Page 1 of 6

time	wind dir.	wind speed (m/s)	cloud cover (n/8)	water temp. °C	dolphins			snorkelers n°	large boats	small boats	Event
					n° surface	n° u/w	young				
07.30	NNW	14	1	24					X		Begin observations. 3 large boats moored in Zone C.
08.10									X		A 4th large boat arrives and moors in Zone C.
08.25											Dolphins seen in Zone D.
08.33					30						d/C (i.e., dolphins enter Zone)
08.45											d/B
08.50		16									
08.53											d/A
09.12											d/B
10.00								11		X	s/IN (i.e., swimmers enter Zone B)
10.02											d/A
10.14			3								d/B

Determination of dolphin group size

Determining how many dolphins there are in a group is a difficult task, and obviously this difficulty increases with the increase of group size.

A most important consideration is consistency (precision) in methods, so that the data collected in December are comparable to those that were collected in January. In this respect, precision is as important as, if not more important of, accuracy (the ability of a measurement to match the actual value of the quantity being measured). In fact, in our case absolute accuracy (i.e., the ability of knowing the exact number of dolphin in a group) is not so important. It is OK to have an approximation of the real number (for example, 30 ± 5), but at the same time it is necessary that such approximation be done always in the same way.

A significant problem is caused by the fact that very rarely are all the dolphins in a group at the surface at the same time: new dolphins rapidly appear in the spot where the dolphins you just counted have disappeared underwater, and this can be quite confusing when counting individuals in a group that has more than a handful of animals in it.

When trying to determine the size of a dolphin group, always consider the boundaries in which such size is contained. Try to decide which is the minimum possible number (for example, certainly no less than 20), and maximum (e.g., certainly no more than 30). You can then decide that your "best" estimate is somewhere in between, for example around 25. If the group remains the same for a long time, like it happens in Samadai, then you can attempt estimates several times, and improve your estimate in the process.

If the group is very large and the dolphins are not tightly bunched together in a ball, and if the group takes an elongated or irregular shape for a while, you can seize that opportunity for mentally dividing the group in two or more subgroups, which are easier to handle, estimate the sizes of the subgroups, and then add the resulting partial numbers for a grand total. If you are not alone you can assign different subgroups to different observers for best results. If the subgroup sizes appear to be more or less equal, you can estimate the size of one, and then multiply the estimate by the number of subgroups to obtain approximate total group size..

Having the opportunity of counting dolphins from underwater will solve the problem of not being able to see all the dolphins at the same time. Estimating group size from above the surface will therefore always provide a lower figure than from below the surface. It is very important that during the Monitoring Programme estimates of the same dolphin group be provided from both viewpoints (above and below the water), in order to allow the future calculation of a correction factor to compensate for the shortcomings of estimating group size from above surface. In any event, **never average figures collected from above water with figures collected below**. Keep the numbers separate. The underwater figure will always be more accurate.

Determination of the presence of young dolphins

Information on the presence or absence of young in the dolphin group is important because it will enable to determine if there is breeding seasonality in the dolphins using Sha'ab Samadai. This has management implications because a group of dolphins may be more vulnerable to disturbance when it contains young animals, particularly if these are newborn calves.

It is useful to distinguish the dolphins composing a group into size classes, that can in some cases be used to infer age classes:

(1) **Newborn**. A dolphin up to about 105 cm, sometimes showing faint foetal creases, folded fins, and flukes; constantly in close association with an adult; immature swimming style with stereotyped surfacing pattern when breathing.
(2) **Calf**. A dolphin estimated to be older than a newborn but less than 1 year of age; less than ¾ of an adult (around 105-128 cm); in clear association with an adult, but not as strictly as a newborn.
(3) **Subadult**. A dolphin of length approximately 128-170 cm, approaching adult proportions and adult locomotion patterns, but with fins noticeably smaller and bodies less robust than adults; usually swimming in association with an adult, but sometimes independently.
(4) **Adult**. A dolphin of length greater than 170 cm.

When marking presence or absence of young in Form B, consider as "young" only individuals belonging to classes (1) and (2) above, i.e., only newborn and calves. Use a combination of relative estimation of size (animals must be less than ¾ of adult size) and swimming behaviour for your decision.