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CRITERIA FOR THE EVALUATION OF NOMINATIONS TO THE NETWORK OF SITES OF IMPORTANCE FOR MARINE TURTLES IN THE INDIAN OCEAN – SOUTH-EAST ASIA REGION

Summary

Since CMS COP10 the Signatories to the CMS Memorandum of Understanding on the Conservation and Management of Marine Turtles and their Habitats of the Indian Ocean and South-East Asia (IOSEA) have adopted the IOSEA Network of Sites of Importance for Marine Turtles (UNEP/CMS/ScC18/Inf.10.3.3). The evaluation criteria presented here aim to provide an objective tool for assessing the inclusion of new sites to the network, with a view to prioritising the most critical sites.

The new IOSEA site network, together with its evaluation criteria, makes an important contribution to implementing and strengthening the CMS mandate on ecological networks in the marine environment.

Criteria for the Evaluation of Nominations to the Network of Sites of Importance for Marine Turtles in the Indian Ocean – South-East Asia Region

Version:
19 July 2013

Secretariat of the Indian Ocean – South-East Asia Marine Turtle Memorandum of Understanding

INTRODUCTION

The Signatory States to the *Memorandum of Understanding on the Conservation and Management of Marine Turtles and their Habitats of the Indian Ocean and South-East Asia* (IOSEA Marine Turtle MoU) have resolved to establish a *Network of Sites of Importance for Marine Turtles in the Indian Ocean – South-East Asia Region.* The overarching goal of the IOSEA Marine Turtle Site Network is to promote the long-term conservation of sites of regional and global importance to marine turtles and their habitats. The network will serve as a mechanism for sites to operate more cooperatively and synergistically, both ecologically and administratively, rather than working in isolation with minimal coordination. The use of objective criteria to evaluate sites nominated for inclusion in the network aims to prioritise the most critical sites needed to secure the future of marine turtle species/management units.

Detailed information on the rationale for the site network proposal, the process for nominating and evaluating candidate sites, and alternative approaches for coordinated governance of sites included in the network is presented in the annex to the resolution that formally established the Site Network[1]. The Site Network will be populated with sites nominated by Signatory States, and formally accepted for inclusion in the network by the Meeting of Signatory States, based on a recommendation of the IOSEA Advisory Committee. A complementary, parallel process is envisaged whereby a "master list" of priority candidate sites will be drawn up to help guide Signatory States in their site nomination considerations.

This document presents the criteria that will be used by the Advisory Committee to: (i) evaluate Signatory State nominations of new sites; (ii) assess the rationale for continued inclusion of existing sites; and (iii) conduct gap analyses for the overall network to identify priorities for inclusion of additional sites. While proponents need not be pre-occupied with the details of the scoring mechanism, they should be familiar with the rationale and guidance underpinning each of the evaluation criteria when considering whether to nominate a given site. Throughout the document, cross-references are made to the template for the IOSEA Site Network Information Sheets that are to be completed for each site nominated for inclusion in the network. These cross-references, shown in square brackets [**SIS #**], are meant to guide evaluators to where they might expect to find relevant information in the Site Information Sheet submitted with the nomination proposal. (Similarly, the template for the Site Information Sheet has cross-references to the Evaluation Criteria, to help proponents assess whether or not they have provided sufficient information for evaluation purposes.)

There are 18 evaluation criteria, divided into four categories: Ecological and Biological, Governance, Socio-economic and Political, and Network-wide Ecological. A weighting scheme is used to differentiate the relative importance of the various criteria. The maximum value assigned to each criterion determines its relative importance in the overall rating. Points are awarded against each criterion, up to its maximum value.

Guidance is provided to assist evaluators and proponents in their respective tasks. While the assessments should strive to be objective, they will inevitably include a measure of subjectivity. In cases where quantitative data or even expert opinion are not available, evaluators should try to reach consensus on a score that best reflects the actual situation. Where uncertainty or lack of data is an important issue for a particular site, evaluators might recommend that priority be given to future funding/research to fill the data gap.

For a site to be recommended for inclusion in the network, it must obtain a minimum score against *each* of the four categories, as well as a minimum *total score*. For example, a site must obtain a minimum score of 20 from the five criteria that make up the Governance Criteria category. The site must also achieve a minimum total score of 75 over all categories combined.

EVALUATION CRITERIA FOR THE IOSEA MARINE TURTLE SITE NETWORK

I. ECOLOGICAL AND BIOLOGICAL CRITERIA (Minimum Total Category Value: 18)

EB1a. Turtle abundance (at nesting sites) [SIS 9]

Definition: The number of marine turtles constituting a management unit [2], the size of which is considered to be of regional importance, which the associated nesting site regularly supports.

Rationale: At marine turtle nesting sites, the larger the number of adult females, the larger the number of clutches or hatchlings expected to contribute to the maintenance/growth of the population (except if density-dependent mortality is occurring, such as on a massed nesting beach). Thus, a site that supports a large number of marine turtles is critical for sustaining turtle management units.

Maximum Possible Value: **15**

Fixed Scale (for nesting sites): (Adapted from Wallace et. al. 2010, Plos One paper on Regional Management Units, where numbers are derived from an average number of annual nesting females, for the management unit, for at least 5 years of data).

Score per associated management unit	3	6	9	12	15
C. caretta	<100	101-1,000	1,001-5,000	5,001-10,000	>10,000
C. mydas	<100	101-1,000	1,001-5,000	5,001-10,000	>10,000
L. olivacea	<100	101-1,000	1,001-10,000	10,001-100,000	>100,000
N. depressus	<10	11-500	501-1,000	1001-5000	>5,000
D.coriacea	<10	11-100	101-500	501-1000	>1000
E. imbricata	<10	11-100	101-500	501-1000	>1000

Guidance: If quantitative data are lacking in the site nomination, local or other expert opinion may be called upon to provide an indicative measure of abundance. [3]

EB1b. Turtle abundance (foraging sites) [SIS 9]

Definition: The relative number of marine turtles (of any species) foraging at a site, which is considered to be of regional importance.

Rationale: At marine turtle foraging sites, the larger the relative number of individuals (as evidenced by any of the following categories), the more important that foraging site is likely to be for sustaining one or more turtle management units.

Maximum Possible Value: **15**

FIXED SCALE		INDICATORS OF RELATIVE ABUNDANCE
NO RECORDS	**0**	No records of foraging turtles despite efforts made to assess foraging habitat.
SPORADIC FORAGING	**5**	Foraging turtles only occasionally recorded in the area
MODERATELY IMPORTANT FORAGING SITE	**10**	• Foraging turtles regularly but intermittently observed from boat or by divers; and/or • Occasional records of international flipper tag returns (from >200 km); and/or • Occasional stranded turtles; and/or • Occasional by-catch reported; and /or • Occasional destination of satellite tracked turtles
VERY IMPORTANT FORAGING SITE	**15**	• High density of foraging turtles easily observed on a daily basis from boat or by divers; and/or • Relatively high rate of long distance flipper tag returns (from >200 km); and/or • Relatively high rate of stranded turtles; and/or • Relatively high rates of by-catch reported; and /or • Destination of relatively high numbers of satellite tracked turtles

EB2. Species or management unit richness [SIS 9]

Definition: The number of species or marine turtle management units (if known) regularly using a site's nesting habitat or foraging habitat (for which abundance data are generally lacking).

Rationale: The greater the number of marine turtle management units supported by a site, the higher the contribution of the site to regional marine turtle conservation.

Maximum Possible Value: **15**

Fixed Scale:

6 = The site regularly supports 1 species or management unit (if known)
9 = The site regularly supports 2 species or management units (if known, of one or more species)
12 = The site regularly supports 3 species or management units (if known, of one or more species)
15 = The site regularly supports > 3 species or management units (if known, of one or more species)

Guidance: This criterion considers only the *number* of species or management units supported by a given site; it does not consider the *rarity* of the species concerned, which is addressed by criterion EB3.

EB3. Presence of rare marine turtle species [SIS 9]

Definition: Presence of a marine turtle species that is considered rare in the IOSEA region.

Rationale: Protection of sites supporting regionally rare marine turtle species contributes to conserving genetic diversity, which provides turtles with greater adaptive alternatives in the face of future (unpredictable) changes. This in turn reduces the risk of devastating population declines, local extirpations and species extinctions, by providing more options for recovery and resilience.

Maximum Possible Value: **12**

Fixed Scale:

6 = Site is frequented by individuals of one species considered rare, from a regional perspective, by virtue of published regional assessments or expert opinion
9 = Site is frequented by individuals of two species considered rare, from a regional perspective, by virtue of published regional assessments or expert opinion
12 = Site is frequented by individuals of three or more species considered rare, from a regional perspective, by virtue of published regional assessments or expert opinion

Guidance: A species may be rare due to limited overlap of its distribution with the IOSEA region, or because of low abundance in the region; with such a finding based on published regional assessments (e.g. United States Endangered Species Act listings with regard to loggerheads) or expert opinion.

EB4. Resistance and resilience [SIS 6, 7, 8, 9, 15, 16]

Definition: A site containing habitat of importance to marine turtles that is likely to be relatively resistant and/or resilient to disturbance.

Rationale: This criterion specifically considers predicted ecosystem vulnerability and responses to (primarily) anthropogenic disturbance, with an underlying premise that it is important to protect areas that can resist and/or recover quickly from disturbance.

Maximum Possible Value: **8**

Flexible Scale:

1 = Relatively disturbed site, with low/minor relative degree of resistance and resilience.
4 = Site with a relatively modest degree of disturbance, and thus modest resistance or resilience.
8 = Undisturbed site, thus considered to possess a high degree of resistance or resilience.

Guidance: A site where few or no threats to marine turtles and their habitats are known to exist would be characterised as relatively undisturbed and hence of relatively high resistance and resilience; such a site might be assigned a value of 7-8. Examples might include sites where there is a relatively low degree of existing human development and where threats from habitat degradation, including coastal erosion, and natural threats are considered to be low.[4]

II. GOVERNANCE CRITERIA (Minimum Category Value: 20)

G1. Legal framework [SIS 11, 12, 13, 14]

Definition: A legal framework provides adequate protection of the site and of the life stage(s) of the marine turtle population found at the site.

Rationale: While legal and management frameworks vary for protected areas depending on the local context – from traditional management to government-led management, or combinations thereof – the existence of legal (and management) frameworks for protection of the site and its marine turtles, are critical in most cases. A site that lacks adequate legal protection is likely to be a "paper park" with little or no implementation of needed management interventions. A site network designation could be an important driver for an appropriate legal/management framework to be put in place.

Maximum Possible Value: **8**

Flexible Scale:

1 = Documentation provided by proponent suggests very limited degree of legal protection of the site and/or its turtle population.
5 = Moderate, but not completely sufficient, degree of legal protection.
8 = Documentation provided by proponent describes comprehensive and fully adequate legal protection, appropriate to the site context.

Guidance: Site descriptions are expected to include sufficient detail of the legislation and regulations (or traditional laws and norms) in effect to permit an assessment of their efficacy in addressing known/predictable threats. A low score would be assigned to a site where incompatible human activities and/or uses of land or sea are not prohibited through legislation and/or regulation, or where such activities/uses are allowed to occur without any mitigating processes. Where a convincing rationale is given that either private and/or public tenure or customary or traditional approaches do not require legislation, and that land/sea management is demonstrated to be providing fully adequate protection, then the full score may be awarded for the site[5].

G2. Conservation actions [SIS 17, 18]

Definition: Conservation interventions have been undertaken to mitigate known[6] threats to marine turtles identified at the site.

Rationale: Implementation of effective management actions to address threats facing marine turtles at a site indicates a high degree of socio-political will and support for marine turtle conservation and protection. A management authority that is able to demonstrate implementation of activities designed to mitigate important threats to marine turtles indicates that the site has the potential to retain high regional conservation value to marine turtles for the long term. Effective exclusion of activities determined to be incompatible with the conservation of marine turtles and their habitats ensures the long-term protection of the site's value to marine turtles.

Maximum Possible Value: **10**

Flexible Scale:

1 = Documentation provided by proponent suggests a relatively low/minor degree of actual conservation effort.
6 = Modest, but not completely sufficient degree of conservation effort.
10 = Documentation provided by proponent describes a very high degree of exemplary conservation effort (or otherwise the site requires no or only nominal conservation intervention due to the total absence of any threats).

Guidance: This criterion focuses on the "what", whereas the next criterion (G3) focuses on the "how". Refer to the Site Network Information Sheet template for examples of expected management interventions. A site benefitting from a wide array of described interventions and few current threats to marine turtles and their habitats might be assigned a value of 8-9 when assessed against this criterion. Exceptionally, a site lacking natural or human threats to marine turtles and their habitats may be assigned a high value, even in the absence of intensive management intervention, if the demonstrated conservation action includes regular monitoring of the site in question. An extra point may be give to sites where concrete conservation actions have been planned or proposed, but not yet implemented.

G3. Collaborative management, surveillance and enforcement [SIS 17,18]

Definition: Participatory work with local stakeholders to strengthen local stewardship of marine turtles, and/or to provide for adequate surveillance and enforcement of prevailing regulations.

Rationale: In areas where customary management systems or private tenure are in place, community-based approaches to management and enforcement, including co-management [7], will be essential. Adequate human and financial resources for enforcement demonstrate strong support for protecting the site and its marine turtles. For most protected areas, if resources for some form of enforcement are lacking, efforts to prevent overuse and misuse of resources will not be achieved.

Maximum Possible Value: **8**

Flexible Scale:

1 = Documentation provided by the proponent suggests a negligible level of collaborative management, surveillance and enforcement which is clearly insufficient in the context of the site.

4 = Modest degree of collaborative management, surveillance and enforcement, with room for improvement.

8 = Documentation provided by the proponent demonstrates fully adequate level of collaborative management, surveillance and enforcement, in the context of the site.

Guidance: Obstacles to effective collaborative management may include inadequate social organisation, inadequate surveillance due to inaccessibility of portions of a site, inadequate funding for sufficient enforcement staff and equipment to patrol the entire site, as well as insufficient human and legal resources to deal with violations of the regulations in place. Site descriptions are expected to outline in sufficient detail the organisation and resources available for these purposes.

G4. Research and monitoring [SIS 8, 19, 23]

Definition: Extent to which: (i) the site is currently used to monitor marine turtle abundance or other critical parameters (such as at index nesting beaches and other reproductive areas, foraging grounds, refuge and migratory areas); and/or (ii) the site has marine turtle surveys with standardised data that span > 15 years for the site; and/or (iii) survey data are used to estimate trends in the size of management units.

Rationale: Information obtained through monitoring informs adaptive management processes/initiatives. Monitoring activities also present a mechanism to promote stakeholder involvement. An index site and/or sites with a long time-series of monitoring data are of critical importance for understanding the changes in marine turtle populations regionally. They provide essential data to enable modelling robust estimates of population trends, changes in age and sex structures, sources of mortality, etc. A sufficiently long time-series of monitoring data (>15 years), as well as long-term understanding of management activities, is critical to separate long-term temporal and spatial trends from cyclical or shorter-term, serially correlated patterns in ecosystem changes and in changes in characteristics of populations of long-lived, slow maturing species. For these species, anthropogenic and other mortality effects are likely to be detectable only over periods of decades or longer. Furthermore, for marine turtles,

mortality of juveniles and sub-adults may be undetected when monitoring only focuses on nesting females. Therefore, long term monitoring using standardised procedures across marine turtle habitats and on diverse life stages is critical.

Maximum Possible Value: **8**

Fixed Scale:

4 = The site is characterised by one of the following: (i) Contains an index beach, foraging habitat, or reproductive habitat; (ii) Survey data based on standardised procedures span > 15 years; (iii) Survey data have been used to estimate trends in the size of the management unit associated with the site (if known).

6 = The site is characterised by two of the following: (i) Contains an index beach, foraging habitat, or reproductive habitat; (ii) Survey data span > 15 years; (iii) Survey data have been used to estimate trends in the size of the management unit associated with the site (if known).

8 = The site is characterised by all three of the following: (i) Contains an index beach, foraging habitat, or reproductive habitat; (ii) Survey data span > 15 years; (iii) Survey data have been used to estimate trends in the size of the management unit associated with the site (if known).

Guidance: Site descriptions are expected to give evidence (for example, by citing published literature) that one or more of these conditions have been met.

G5. Sustainable human and financial resources [SIS 15, 21, 22]

Definition: Availability of long-term resources (human and financial) to enable effective governance activities, including monitoring, management interventions, surveillance and enforcement, and performance evaluation. Such resources may be considered to be sustainable where, for example, a legal mechanism provides for finance and staffing.

Rationale: Effective implementation of governance activities requires long-term funding. Sustainable financing for a site indicates strong political will and leadership support for protection of the site and its marine turtles. Secure finance strategies are comprised of a diverse portfolio of complementary revenue sources. Different funding mechanisms will be appropriate depending on the type of organisation managing the site and the types of permanent and short-term activities that are identified, as required, to ensure the long-term conservation of marine turtles and other resources of the site.

Maximum Possible Value: **8**

Scale:

1 = Documentation provided by the proponent suggests low/very limited actual or prospective long-term financing and/or human resources.

5 = Modest long-term financing/human resources, with only modest prospect of improvement.

8 = Documentation provided by the proponent indicates substantial long-term financing/human resources already in place.

Guidance: Site descriptions are expected to document the extent of human and financial resources available for governance activities, and offer evidence of future prospects in this regard. Strong evidence that substantial long-term financing will be forthcoming in the near-future, perhaps catalysed by inclusion of the site in the network, may be scored toward the upper end of the scale. An additional point may be added for proponents that have clearly articulated specific human and resource needs at the site [SIS 22], a prerequisite to securing necessary financing.

III. SOCIO-ECONOMIC AND POLITICAL CRITERIA (Minimum Category Value: 15)

S1. Cultural importance [SIS 10]

Definition: Site contains prehistoric, historic, and/or contemporary resources, or embodies non-consumptive traditional beliefs/practices of cultural, religious and/or spiritual significance, in relation to marine turtles.

Rationale: A site that is culturally important provides additional justification for its protection, with added social and political values that may help to leverage more resources for long-term protection.

Maximum Possible Value: **6**

Flexible Scale:

1 = Site is described as having low/minor cultural importance.
3 = Site is recognised as having national cultural importance.
6 = Site is recognised as having national cultural importance and is managed through customary/traditional law

Guidance: Site descriptions are expected to document a site's cultural importance, if any, preferably with reference to published or unpublished historical or other accounts which may give an indication of relative importance in a national context.

S2. Compatible activities [SIS 14, 15]

Definition: Activities occurring within the vicinity of the site that are compatible with the conservation of marine turtles and their habitats.

Rationale: Allowing and encouraging local communities associated with protected sites to engage in socio-economic and cultural activities that are consistent with ecological objectives (i.e. do not degrade the integrity of marine turtle habitat and do not entail unsustainable use of marine turtles) should complement effective governance through community support for restrictions on incompatible activities. Conversely, a large number of incompatible socio-economic activities occurring at the site may degrade its value for marine turtle conservation.

Maximum Possible Value: **6**

Flexible Scale:

1 = Mostly (but not only) incompatible socio-economic activities occur at the site.
3 = Some incompatible socio-economic activities are occurring at the site.
6 = Few, if any, incompatible socio-economic activities are occurring at the site.

Guidance: Site descriptions are expected to document the activities occurring at the site and indicate whether or not any of these are incompatible with the conservation of marine turtles, in sufficient detail to allow for a subjective rating. Refer to instructions given with the Site Information Sheet template (especially point 16) for examples of potentially incompatible activities. Sites that demonstrate that they have a higher probability of making a significant contribution to the network (e.g. by virtue of having to contend with fewer incompatible activities) are rated more highly [8].

S3. Educational value [SIS 20]

Definition: Existence of actual, or future opportunities for, educational and outreach activities, by virtue of the site's location and other inherent characteristics.

Rationale: Education and outreach programs that raise awareness of the value of coastal habitats (which are also of importance to marine turtles) can bring about changes in behaviour and attitudes, by providing the local community with information to make informed decisions about the use of their resources.

Maximum Possible Value: **6**

Flexible Scale:

1 = Documentation provided by the proponent suggests limited existing educational/outreach activity or potential.
3 = Modest educational/outreach activity or potential.
6 = Documentation provided by the proponent suggests extensive existing educational/outreach activity or potential.

Guidance: Site descriptions are expected to document existing educational initiatives, and/or to indicate the potential for extending the scope and coverage of these activities. Factors to consider include: permanence of the educational value, accessibility of the facility and integrity of the access infrastructure, and number of people influenced by the facility. A site with a well-established community-based programme might score towards the upper range of the scale; whereas a relatively isolated site that lacks practical public access might be assigned a low score when assessed against this criterion. A site that has no interaction with the general public may have no direct educational value to marine turtle conservation (but might score highly in other criteria that tend to favour remote sites).

S4. Existing recognition [SIS 13]

Definition: Length of existing protected status or other national, regional or international recognition for the site's value to marine turtles.

Rationale: A history of recognition of the importance of the site to marine turtles may be indicative of awareness and political support for the site's protection. While it could be argued that sites already benefiting from protected status for an extended period of time are *least* in need of additional recognition from inclusion in the network, the counter-argument is that a site with longstanding protected status has more immediate potential to engage actively with other network sites (and therefore make a significant contribution to the formation of the regional network, through sharing of experience, lessons learned etc.).

Maximum Possible Value: **6**

Fixed Scale:

0 = The site has never been afforded any protection status
2 = The site has been afforded protected status for < 5 years.
4 = The site has been afforded protected status for ≥ 5 years and ≤ 10 years.
6 = The site has been afforded protected status for > 10 years.

Guidance: Note that this criterion looks only at existing 'recognition' of the site in quantitative terms, as distinct from the efficacy of the legal framework for protection and actual management interventions, which are to be assessed through the Governance Criteria.

S5. National significance [SIS 8, 9, 10, 19]

Definition: Significance of the site in a national context, relative to other sites.

Rationale: Uniqueness of the site (for example, if this is the only area of high abundance or nesting of marine turtles in the country, or the country's only transboundary site) may provide additional justification/motivation for social and political support for the site's protection. A site identified to be of national importance, by virtue of its uniqueness, might assist in leveraging resources for long-term protection.

Maximum Possible Value: 6

Flexible Scale:

1 = Site is not readily distinguished from other sites, in terms of its physical/ecological characteristics and national importance.
3 = Site is described as having physical/ecological characteristics and national importance shared by some other sites in the country.
6 = Site is described as having exceptional national importance by virtue of its unique physical/ecological characteristics.

Guidance: A site containing the only marine turtle nesting habitat in a country might be assigned a maximum value of 6 when assessed against this criterion. Where many sites exist in a given country, making it difficult to differentiate among them (in the absence of information from the proponent), other indicators of relative importance might include existing local or national protected status designation.

S6. Perceived ancillary benefits as a consequence of the site's inclusion in the network [SIS 8, 9, 18]

Definition: Perception of ancillary conservation benefit (e.g. for other biodiversity/local communities associated with the site, or other related conservation initiatives), that would be achieved through the site's inclusion in the network.

Rationale: Marine turtle conservation should not and cannot occur in isolation. Value is placed on adding sites to the network that, as a result of their designation, would likely secure substantial, ancillary conservation benefits, irrespective of other considerations. Potential conservation benefits might be described in terms of protection of other biodiversity occurring at the site, greater social and political commitment to stronger conservation policies, enhanced community-based commitment to long-term conservation, greater private sector support for related conservation initiatives (e.g. initiatives to address threats posed by inshore and offshore fisheries) etc.

Maximum Possible Value: **6**

Flexible Scale:

1 = Limited ancillary conservation benefit is expected from inclusion of the site in the network, by virtue of low or unknown biodiversity value or other threatened species.

4 = Modest ancillary conservation benefit is expected from inclusion of the site in the network (e.g. by virtue of empirical or expert data indicating the site's biodiversity value or presence of other threatened fauna).

6 = Substantial ancillary conservation benefit is expected to be achieved through inclusion of the site in the network (e.g. by virtue of other biodiversity value and expected value added to existing conservation initiatives, supporting/ strengthening existing socio-economic interventions etc.)

Guidance: This is a largely subjective interpretation, both on the part of the proponent and reviewer. The potential for ancillary conservation benefits for biodiversity might be assessed from empirical or expert data indicating the site's high biodiversity value or presence of other species of conservation concern that would directly benefit (e.g., sea bird colonies, dugong, cetaceans, sea grass pastures, coral reefs, fragile coastal dune systems) or other statements made by the proponent with regard to existing socio-economic initiatives.

IV. NETWORK-WIDE ECOLOGICAL CRITERIA (Minimum Total Category Value: 10)

N1. Representativeness and replication [SIS 8, 9]

Definition: Inclusion of the site contributes to the network's: (i) adequate representation of the full range of habitat diversity required for the maintenance of marine turtle management units and species of the IOSEA region (*representativeness*), and/or (ii) inclusion of multiple sites containing identical habitat types (*replication*).

Rationale: Representativeness and replication are required components of an effective site network. Including examples of each habitat used by marine turtles across their life history stages – including nesting, foraging, reproductive and migratory habitat, and examples of each community type within these habitats – achieves a network of representative marine turtle habitat sites. Replication of these critical habitat types in the network reduces the risk of regional losses of a single habitat type by spreading the risk, and increases the chance for a marine turtle habitat type to survive disturbances[9].

Maximum Possible Value: **4**

Flexible Scale:

1 = Low/minor contribution to representativeness/replication: the habitat types included in the site are already well represented in the network.

2 = Modest contribution to representativeness/replication: the habitat types found at the site are moderately covered within the network.

4 = Very significant/unique contribution to representativeness/replication: the habitat types found at the site are not yet well represented in the network.

Guidance: Evaluators must bear in mind other sites already in the network when making this assessment. In the initial phase of network development with few sites in the network, assessment against this criterion is likely to result in a score of 3 or 4. For example, a site containing marine turtle nesting, foraging and development habitat, which at the initiation of the network would contribute to representation (and eventual replication) of the full range of marine turtle habitats, would be assigned a score of 4.

N2. Ecological connectivity [SIS 5, 24]

Definition: Inclusion of the site contributes to protecting functional links among areas of marine turtle habitat. Inclusion of this site – considering geographic location and ecological characteristics in relation to other sites in the network, and based on information from ecological, migration and genetic studies – contributes to ecological connectivity between sites.

Rationale: Providing, protecting and promoting connectivity among habitat types required for life history stages of marine turtles is critical for the maintenance of turtle management units. A network of managed sites can be designed to protect functional connectivity between marine turtle habitats, where conservation activities at individual sites in the network benefit from one another. The *shape* (to consider edge effects, where margins of protected areas may be heavily exploited) and *spacing* of the individual sites in the network determine the ecological connectivity of the network as a whole.

Maximum Possible Value: **8**

Flexible Scale:

1 = Low/minor contribution to connectivity.
5 = Modest contribution to connectivity.
10 = Very significant contribution to connectivity

Guidance: Functional links between individual sites might include, for example, inter-nesting habitat adjacent to a nesting beach, or serial nesting beaches known to be used by individuals of a single management unit. Sites that are known to be in close proximity to other important marine turtle habitats would be assigned a high value. For example, a site that lies adjacent to other marine turtle foraging areas might be assigned a value of 6 or 7 when assessed against this criterion[10].

N3. Area [SIS 24]

Definition: The area of a site or combined area of functionally-linked sites contributes to protecting the area of marine turtle habitat needed to sustain turtle management units.

Rationale: Protection of sufficient habitat area is a required component of an effective site network. The area of relatively undisturbed habitat may be critical to the ability of members of a turtle management unit to nest, forage, reproduce or migrate.

Maximum Possible Value: **12**

Fixed Scale:

1 = Site comprises less than 5% of the estimated habitat area for a marine turtle management unit.
3 = Site comprises 5% to 20% of the estimated habitat area for a marine turtle management unit.
6 = Site comprises > 20% to 35% of the estimated habitat area for a marine turtle management unit.
9 = Site contributes from > 35% to 50% of the estimated habitat area for a marine turtle management unit.
12 = Site encompasses more than half of the estimated area for a marine turtle management unit.

Guidance: The proportion of essential habitat refers to a marine turtle management unit's required habitat for each life history stage. For instance, a site that comprises about a third of the area of a management unit's total known nesting habitat, would warrant the assignment of 6 points. Higher values might be assigned to sites whose area is transboundary in nature; with an expectation that this attribute should, in itself, promote cooperation among the jurisdictions responsible for management.

Endnotes

1. Resolution to Establish the IOSEA Network of Sites of Importance for Marine Turtles in the Indian Ocean – South-East Asia Region (Bangkok, 2012). Available at:

http://ioseaturtles.org/UserFiles/File/Resolution_IOSEA_Network_of_Sites_of_Importance_for_MT+Annex.pdf

Some have suggested that there is a need to elevate the site network to an ecological network, in the true sense, by incorporating provisions that go beyond the protection of nesting, foraging and reproductive habitat (i.e. to embrace new ways to promote the management of critically important corridors and other marine areas, especially those beyond national jurisdictions, by establishing international marine sanctuaries/reserves or incorporating existing ones that are important for turtles, into the network). While it is beyond the scope of this particular document to contemplate such additional measures, it is clear that further consideration should be given to the challenge of addressing threats to marine turtles beyond national jurisdictions.

2. Management units can be based on molecular studies as per Moritz et al. 2002 and Dethmers et al. 2006 etc., such that they are genetically determined and synonymous with genetic populations; they can be based on tagging/migration data in combination with molecular data eg. DPS (Connant et al. 2009); or in the absence of detailed quantitative data they could be considered in context of RMUs (Wallace et al. 2010). It is left to the (Advisory Committee) evaluators to agree upon and use consistently a suitable definition of the management unit and to determine whether or not a proposed site is associated with a known management unit.

3. Alternatively, for future consideration: it has been suggested to use some estimator of percentage of population rather than a fixed absolute number; as this fixed number will change over time as the population increases or decreases, and also as population estimates vary from different techniques and improved information. A percentage value could be less subject to gross variation, thereby reducing the need to continually revise these scores. However, the present difficulty in obtaining estimates of population (management unit) size makes this approach unrealistic to implement at the present time.

4. It is recognised that outcomes of climate change – including relative sea-level rise, rising air and sea surface temperatures, and possibly the spread of invasive alien species (alterations to species' distributions) – are also predicted to affect marine turtles and their habitats. However, making credible predictions about these threats will be a major challenge, possibly requiring the development of vulnerability risk models. Given the inherent difficulties in evaluating this criterion objectively, it has been proposed that this criterion focus on mainly on anthropogenic threats that can realistically be evaluated (and possibly mitigated) by the agency/agencies concerned; and that consideration be given in future to designing an alternative scale that is less subjective.

5. The efficacy of such alternative legal frameworks may need to be verified through an independent expert or local referees etc., and re-assessed over time to be confident of the efficacy of the level of protection that is reported.

6. Ideally, site management would include also an effective mechanism for contingency planning to deal with new and unpredicted threats; however this is unlikely to be realised in the present situation of most Signatory States.

7. Co-management may be defined as management through the collaboration of the local community, agencies from all levels of government, NGOs and, potentially, additional external organisations.

8. It could be argued that sites with many incompatible activities could benefit as much or more from inclusion in the network, however it should be remembered that this is only one of nearly 20 criteria that will be assessed to determine a site's suitability for inclusion in the network. If there are other compelling grounds for selecting a given site, this should be manifest in the overall assessment of the site.

9. This criterion implies that there will be a clear advantage for sites that are nominated in the initial stage of the network (i.e. a site may receive a relatively high score by virtue of the fact that it is evaluated when the network has very few sites). Once a network is "mature" and more "populated" the higher scores of the early nominated sites could well have much less value relative to later-nominated sites. Although it is only one of 18 criteria, this bias favouring sites with early nomination needs to be kept in mind. The maximum possible score for this criterion has been set at a low value, to avoid having this bias cause too much distortion in the early formation of the network.

Note also that there is inherent possibility of conflict between representativeness and replication – a site might contribute to representativeness by adding a previously unrepresented habitat type, but in this case it would have no replication value. Conversely, a site might contribute to replication value by replicating the habitat type in existing sites, but add nothing new for representativeness.

10. Consideration should be given in future to improving some of the scale definitions, in cases where the current draft is subjective.

General Remarks

Sites should be grouped into clusters that are relevant in terms of turtle ecology and biology, but also management/governance. Having sites too finely split or too coarsely grouped becomes similarly irrelevant in the context of the Site Network.

Paired sites are those that are contiguous in the Site Network, which may or may not span more than one country; *twinned* sites are spatially separated in the Site Network, but a species uses both directly. It may be possible for one country to submit a single, multi-site nomination (i.e. a single nomination that includes multiple sites); but a single multi-site nomination that encompasses multiple jurisdictions (i.e. involving more than one country) might be difficult to achieve.

While a site that lies adjacent to, for example, foraging areas would clearly serve connectivity, the value of connectivity must be balanced with the importance of the sites being connected. The connection of sites, no matter how strong the connection, may not advance the objectives of the network if one of the sites is of low value.

The concept of connectivity also raises questions about the geographic scope of a given site where, for example, it might make sense to incorporate and manage a number of beaches as components of a single site, rather than treat them as separate, "connected" entities.

* * * * *

In a previous version of these Evaluation Criteria, a criterion was included to deal with the situation of degraded sites with capacity for rehabilitation which could be important for preventing the extinction of management units and promoting their eventual recovery. However, it was decided to remove that particular criterion for the time being, on account of a number of unresolved issues with the concept. While it is unlikely that Signatory States will prioritise the inclusion of degraded sites in the network, at least in the initial stages, it may be worthwhile flagging such sites for future consideration since they may eventually contribute to connectivity, representativeness etc.

Acknowledgements

The first version of these Evaluation Criteria was prepared by Dr. Eric Gilman, under contract to the IOSEA Secretariat, and subsequently refined by the Secretariat (Douglas Hykle) in consultation with the IOSEA Advisory Committee and other experts. A previous version benefitted from careful scrutiny and extensive comment from members of the Advisory Committee (Dr. Jack Frazier and Dr. Mark Hamann, in particular), as well as several external reviewers (Dr. Ben Lascelles, Dr. Kelly Macleod, Dr. Taej Mundkur, and Dr. Paul O'Neill). The current text incorporates a number of additional constructive changes proposed by the fourth meeting of the Western Indian Ocean – Marine Turtle Task Force (South Africa, December 2012). The Secretariat has endeavoured to incorporate as many of their suggestions and comments as possible, and has introduced numerous other refinements to the text, which has been significantly improved as a consequence.

Selected references

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De Silva, N & Bass DK (2011) Nesting conservation priorities by geographic scale: preliminary lessons from the application of percent thresholds to the identification of Key Biodiversity Areas for Marine Turtles in Melanesia. *Anim. Conserv*.14(1), 16-17.

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Wallace BP, DiMatteo AD, Hurley BJ, Finkbeiner EM, Bolten AB, et al. (2010) Regional Management Units for Marine Turtles: A Novel Framework for Prioritizing Conservation and Research across Multiple Scales. PLoS ONE 5(12): e15465. doi:10.1371/journal.pone.0015465

Annex: DRAFT EVALUATOR RATING SHEET

Signatory State: _____ Site name: _____

Date evaluation concluded: _____

Evaluator(s): _____

**** * PLEASE REFER TO THE INSTRUCTIONS ON NEXT PAGE * ****

CRITERIA	SCORE RANGE	SCORE	SUB-TOTAL
I. Ecological and Biological Criteria			
EB1a. Turtle abundance (at nesting sites)*	**3 6 9 12 15**		
EB1b. Turtle abundance (foraging sites)*	**0 5 10 15**		
EB2. Species and/or management unit richness	**6 9 12 15**		
EB3. Presence of rare marine turtle species	**6 9 12**		
EB4. Resistance and resilience	**1 to 8**		
Sub-Total [*cf. Expected minimum category value = 18*]			
II. Governance Criteria			
G1. Legal framework	**1 to 8**		
G2. Conservation actions	**1 to 10**		
G3. Collaborative management, surveillance and enforcement	**1 to 8**		
G4. Research and monitoring	**4 6 8**		
G5. Sustainable human and financial resources	**1 to 8**		
Sub-Total [*cf. Expected minimum category value = 20*]			
III. Socio-economic and Political Criteria			
S1. Cultural importance	**1 to 6**		
S2. Compatible activities	**1 to 6**		
S3. Educational value	**1 to 6**		
S4. Existing recognition	**0 2 4 6**		
S5. National significance	**1 to 6**		
S6. Perceived ancillary benefits as a consequence of the site's inclusion in the network	**1 to 6**		
Sub-Total [*cf. Expected minimum category value = 15*]			
IV. Network-wide Ecological Criteria			
N1. Representativeness and replication	**1 to 4**		
N2. Ecological connectivity	**1 to 8**		
N3. Area	**1 3 6 9 12**		
Sub-Total [*cf. Expected minimum category value = 10*]			
GRAND TOTAL [*cf. Expected minimum total score = 75*]			

Instructions to Evaluators:

As seen throughout this document, the evaluation scales have values ranging from 0 to 15, together with descriptive text (particularly for the top and bottom end of the scale, and one to three values in between) to help guide evaluators. **In general, values can be assigned along the full continuum, and need not be restricted to the indicative values / descriptions shown in each scale.** Also, in exceptional cases, a zero value may be assigned when a particular criterion is not met at all.

However, the "Fixed Scales" associated with criteria EB1, EB2, EB3, G4, S4, and N3 are the exceptions to this general rule, as they do not accommodate intermediate or zero values.

Note in relation to Criterion EB1 (a/b): Where several species nest or forage at a single site, the score for the most abundant species is to be used, not the sum of scores for all of the species present. This is because species/management unit richness is evaluated under Criterion EB2.

Feedback to proponent (optional):

Recommendation to Meeting of IOSEA Signatory States, and final comments: