EDGE Coral Reefs Workshop
Zoological Society of London
Workshop Report

1. Executive Summary

The EDGE Coral Reefs workshop was convened with international coral reef experts on 4th and 5th March 2010 at the Zoological Society of London (ZSL). The workshop outputs were:

a) Identification of the EDGE Coral Reef programme's ten focal species;
Anomastraea irregularis
Dendrogyra cylindrus
Heliofungia actiniformis
Horastrea indica
Parasimplastrea sheppardi
Catalaphyllia jardinei
Dichocoenia stokesii
Physogyra lichensteini
Ctenella chagius
Acropora palmata
b) Development of the EDGE Fellowship programme.
c) An associated research agenda to enable identification and implementation of effective conservation measures for focal species.

The EDGE of Existence conservation programme, developed by ZSL, is based on a global priority setting technique that incorporates both a species' contribution to phylogenetic diversity and its threat status.

It is now acknowledged that tropical coral reefs are threatened with functional extinction within this century, predominantly due to global climate change (Veron *et al*. 2009). In direct response, the EDGE of Existence is implementing a new programme, EDGE Coral Reefs, that will focus conservation efforts towards the world's most evolutionarily distinct (ED) and globally endangered (GE) Scleractinian coral species and their associated habitats.

The current Scleractinia phylogeny is not yet comprehensive enough to allow calculation of robust ED scores for every species according to standard EDGE methodology. However, the phylogeny is sufficiently developed to allow confident identification of many of the most highly evolutionarily distinct species (Fukami *et al*., 2008). Scleractinian corals have all been assessed and included on the IUCN Red List of Threatened Species (IUCN, 2010), so extinction risk data are available. Given the urgency of the coral reef crisis, the EDGE of Existence programme decided it was critical to start conservation action immediately by identifying the priority EDGE coral species based on the best available phylogenetic information and expert opinion.

A candidate species short list, prepared prior to the workshop by remote consultation with a range of coral experts, was vigorously evaluated through the workshop process to identify ten high priority (focal) evolutionarily distinct (ED) and globally endangered (GE) Scleractinian coral species. Participants were split into two working groups with broadly comparable levels of expertise (see Appendix III for a list of working group members) and the decisions of the working groups were then compared. Eight of the twelve potential focal species (Table 1) were independently selected by both working groups as EDGE species, a striking overlap that supported our approach.

The vigorous evaluation of all candidate species produced three key outputs:

- Ten focal EDGE Scleractinian species (Table 5) currently receiving little or no conservation attention, for which conservation action will be initiated through the EDGE Fellows programme.

- Four ED DD species (Table 4) that represent an exceptional level of evolutionary history, but their conservation status is unknown and threats have not been assessed. Research into the extinction risk of these species is therefore a high priority.
- ED species list (Table 3) - Scleractinian species with above average Evolutionarily Distinctiveness but are not necessarily currently threatened according to their IUCN Red List status. These species will be highlighted on the EDGE website and may become EDGE priority species in the future should their extinction risk increase.

Conservation measures for the identified focal species will be initiated through the EDGE Fellows programme. By supporting and training in-country conservationists and developing their skills to conserve local biodiversity, the Fellowship programme aims to increase conservation capacity and achieve sustainable conservation projects for EDGE species and their associated habitats. An EDGE Fellow carries out a project on a focal species for a period of up to two years in one of three categories; a novel piece of conservation research; develop a species conservation strategy; or implement a targeted conservation action.

Workshop discussions subsequently focused on how to tailor the specifics of the Fellows programme to the field of coral reef conservation and research. EDGE Fellows receive training both in the field and at a two-week course at ZSL's London offices. Field training for Coral Reef Fellows will require proximity to a coral reef for basic training in survey methods and developing *in situ* coral species identification skills. It was suggested that regional training courses could be developed for Fellows in 3 regions initially and Fellows would attend the training course in the region in which they and their focal species are based:
- Western Indian Ocean;
- Central America & Caribbean;
- Coral Triangle (Central Indo-Pacific Ocean).

Feasible locations for Fellows, potential areas of research and conservation action, and potential collaborations within and outside the group, were identified for each focal species (Table 6).

To aid development of an associated research agenda, participants discussed key gaps in knowledge which if addressed would facilitate the conservation of EDGE Scleractinian species and contribute to the development of a robust Scleractinian phylogeny in the longer term. The workshop highlighted a marked lack of knowledge of the basic ecology, physiology and life histories for many of the focal, ED, and ED DD species and therefore the need for a significant amount of research on many species in order to ensure effective conservation actions can be implemented. It was agreed that any research carried out on EDGE focal species, ED species or ED DD, particularly on population estimates, evolutionarily distinctiveness, and distribution, should be fed back into IUCN Coral Specialist Group meetings to update the Red List and inform decisions on threat status for those species currently listed as Data Deficient (DD). The EDGE Coral Reefs programme will also closely liaise with the Scleractinian Working Group on the development of a comprehensive phylogeny. Reviews will be conducted to update the EDGE Coral Reefs focal species as the Scleractinian phylogeny progresses and as further Red List assessments are conducted. This therefore can be considered a dynamic process.

Specific action points identified throughout the report (summarised in Table 10) will be followed up to progress the programme. We now aim to further build effective collaborations with workshop participants and to work with other contacts where identified to encourage effective implementation of conservation measures for focal EDGE Coral species through the EDGE Fellowship programme.

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2. Background to the EDGE Concept and Coral Reefs

The EDGE of Existence conservation programme, launched in January 2007, is based on a global priority setting technique that incorporates both a species' contribution to phylogenetic diversity and its threat status. Conservation programmes habitually prioritise charismatic megafauna and overlook a large proportion of biological diversity. By including a measure of evolutionary distinctiveness, the EDGE of Existence programme aims to conserve a larger diversity of evolutionary history, and therefore a wider variety of life to increase adaptive potential available in the face of climate change and other environmental challenges

Following the publication of evolutionary trees illustrating the phylogenetic relationships between all known living mammals (Bininda-Emonds *et al.,* 2007) and amphibians (Frost *et al*., 2006) collated from existing data; ZSL scientists have been able to calculate an Evolutionary Distinctiveness (ED) score for every species within these two sizeable taxonomic groups. These scores are calculated by dividing the total phylogenetic diversity of a given clade between its members. This is achieved by dividing each tree branch length (measured in 'millions of years before present') by the number of species subtending it. An individual species' ED score is simply the sum of these values for *all* branches from which the species is descended – going back to the predetermined root of the phylogeny.

Individual ED scores are combined with a measure of each species' current extinction risk or "Global Endangerment (GE) score", which is derived from the species' assigned category on the IUCN Red List of Threatened Species ™. This ensures the differing levels of threat each species is experiencing are taken into account in the final EDGE score (Isaac *et al*., 2007). GE scores cannot be calculated for species listed as Data Deficient, because the extinction risk of these species is unknown. For further information on calculation of EDGE scores, see http://www.edgeofexistence.org

The objectives of the EDGE of Existence Programme are to:

1. Raise awareness of the world's most Evolutionary Distinct and Globally Endangered (EDGE) species;
2. Ensure that conservation strategies are developed and implemented for EDGE species not currently being protected;
3. Increase conservation capacity in the countries in which EDGE species occur.

2.i Coral Reefs

It is now acknowledged that tropical coral reefs are threatened with functional extinction within this century, predominantly due to global climate change (Veron *et al*. 2009). In direct response, the EDGE of Existence is rapidly developing a new programme that will focus conservation efforts towards the world's most evolutionarily distinct (ED) and globally endangered (GE) coral species and their associated habitats. This programme is focusing on the hard, reef-building corals, or Scleractinia, and offers another approach and tool for coral reef conservation.

The current Scleractinia phylogeny is not yet comprehensive enough to allow calculation of robust ED scores for every species according to standard EDGE methodology. However, the phylogeny is sufficiently developed to allow confident identification of many of the most highly evolutionarily distinct species (Fukami *et al*., 2008). The ED score for species not included in molecular phylogeny reconstructions, like Fukami et al.'s (2008), was derived from the taxonomic uniqueness and isolation of species' like those represented by monospecific genera in traditional morphology-based evolution models. Scleractinian corals have all been assessed and included on the Red List, so extinction risk data are available. Given the urgency of the coral reef crisis, the EDGE of Existence programme decided it was critical to start conservation action immediately and identify the priority EDGE coral species based on the best available phylogenetic information and expert opinion.

Remote consultation with a range of coral experts resulted in a shortlist of 54 species (Appendix I), which were subsequently assessed in a participatory workshop by a representation of the

consultees (appendix II – participants list and consultee group). The first ten EDGE 'focal species' were identified from the shortlist; defined as those species that are highly likely to emerge as top priorities according to the EDGE criteria when EDGE scores can be calculated using the conventional methodology.

3. Workshop Objectives and Desired Outputs

3.i. Overall Objectives of the EDGE Coral Reef Programme:

- Identify high priority Evolutionary Distinct and Globally Endangered (EDGE) coral species in an international workshop for immediate conservation action;
- Generate public awareness of this extremely diverse ecosystem, the main threats to reefs, and stimulate support and enthusiasm for the conservation of coral reefs;
- Utilise the EDGE fellowship programme to establish coral reef conservation measures at a 'local' level, including the use of Marine Protected Areas (MPAs).
- Develop and implement a research agenda to construct a detailed hard coral phylogeny, enabling the identification of the 100 most evolutionary distinct and globally endangered (EDGE) hard coral species using conventional EDGE methodology.

3.ii. Workshop Outputs

To begin addressing these objectives the following desired workshop outputs were identified:

- Ten focal EDGE Coral species for immediate conservation attention
- Top ED Coral species and Evolutionarily Distinct but Data Deficient (ED DD) Coral species lists
- EDGE Coral Reefs research agenda set
- Definition of EDGE zones (zones with high EDGE species richness)
- Criteria and approach to EDGE Coral Reefs fellows established
- Discussion of EDGE Coral Reefs associate species concept
- Future engagement of participants and other working group members established
- Investigate the potential of a scientific publication based on the workshop and outcomes.

3.iii. 'Rules of Engagement'

It was recognised that EDGE is a novel approach for coral reefs. As such there is a need to identify the gaps in the information available at the time of the workshop and build a realistic agenda to address these gaps in the future. Meanwhile, due to the huge threats facing coral reefs, it is fundamental to initiate the project immediately and carry out best practise based on the current available resources, while also determining the decisions we can and cannot make at this stage. This is a dynamic process and the lists generated will evolve and develop over time. The EDGE concept allows for plasticity through potential future developments in coral taxonomy, phylogeny, ecology, and changes in threat status.

4. Scope & Methodology

4.i Scope

The programme's focus is tropical, shallow water (down to a depth of 100 meters), reef-building corals and within this remit it was concluded that the EDGE corals programme should focus on species in the order Scleractinia, as this is the major group of reef-building corals and it would be very difficult to evaluate the outgroups in the same context. For this reason Octocorallia and Hydrozoan species were excluded from the shortlist before further evaluations were initiated.

4.ii. Evolutionarily Distinctiveness
Arbitrary scores were assigned to each species to establish likely 'ED' scores, based on best available information and expert opinion (appendix II: Participant list). A scale of 1 to 4 was used, with higher numbers representing a higher level of evolutionary distinctiveness. It was decided that the skills and knowledge within the workshop participants enabled a reasonable 'educated guess' of many of the most Evolutionarily Distinct corals, despite the Scleractinian phylogeny not being complete enough to use the standard EDGE methodology. It was widely acknowledged that these evaluations would be a worthwhile process and highly justified as it would allow conservation action for the identified species to begin more rapidly and develop an associated research agenda.

4.iii. Globally Endangered
Participants agreed to use the IUCN Red List of Threatened Species as the standard measure of Global Endangerment, thus adhering as closely as possible to the standard EDGE methodology. There was discussion of the limitations of the current Red List status of many reef building corals, but it was agreed to use this standardised approach and to use the EDGE Corals programme to help inform future Red Listing, in collaboration with the IUCN Coral Specialist Group. The Red List assessments of all species are regularly reviewed and revised using both new information and changes in a species extinction risk. It is accepted that the EDGE lists are dynamic, and will be updated for all taxa at an appropriate timescale to include new data. For example, the EDGE Mammals list was first calculated in 2006, and EDGE scores were updated in 2009 taking into account updated Red List assessments and revisions to the mammal supertree.

Many reef-building coral species are poorly understood, which results in them many being listed as Data Deficient (DD). Standard EDGE practice rules these species out of conventional EDGE scoring, as the conservation status (half of the score) is unknown. However, these species can be allocated an ED score, and compiled into a separate Evolutionarily Distinct but Data Deficient (ED-DD) list. This list identifies species that represent a high proportion of evolutionary history, but for which extra research is required to assess conservation status. If research establishes that these species are threatened, they are highly likely to become future EDGE conservation priorities.

4.iv. Associated Species
It was agreed that species associated with the focal corals should be used as a tool to highlight the ecosystem and to increase the appeal of the coral species to a wider audience. In the future the project could expand to include Evolutionarily Distinct and Globally Endangered species from other taxonomic groups in the coral reef ecosystem.

4.v. Focal Species Evaluation Criteria
An EDGE species has both above average Evolutionary Distinctiveness, and is in one of the threat categories on the Red List (i.e. Vulnerable, Endangered or Critically Endangered). These were the primary criteria taken into consideration when identifying focal species.

The secondary criteria considered were:

- Current level of conservation attention (species receiving little or no conservation attention were prioritised);
- Feasibility of conservation action;
- Importance to the reef ecosystem (including reef-building attributes and the symbiotic species supported); and
- Geographic isolation

Please see Appendix IV & V for more detail on these criteria and a flow chart on the evaluation process.

4.vi Evaluation of the shortlist
The species short list prepared prior to the workshop was first evaluated in two working groups. Participants were split between the two groups so each group contained a broadly comparable

level of expertises (see Appendix III for a list of working group members). This split meant that the decisions of the working groups could then be compared. Professor J.E.N Veron also joined the workshop discussions remotely at key points and provided useful information from his Coral ID & Geographical tools on the candidate species (Appendix VI) to aid the evaluation process. The conclusions of the two working groups were presented to all participants, with the selection process discussed in an open forum

5. Evaluations of Candidate Species

The two working groups added an additional six species to the shortlist during the initial review process, making a total of 60 assessed species. Appendix I summarises the key discussion points and evaluations for each of the 60 shortlisted species. The species evaluations drawn up in the independent working group discussions resulted in a combined agreed list of 12 species identified as potential 'focal species' which fitted the primary EDGE criteria (Table 1). These 12 species were then discussed by the whole workshop group to prioritise the top 10 focal species.

Eight of these potential focal species (the first eight listed in Table 1) were independently selected by both workshop groups as EDGE species, a striking overlap that supports the use of expert opinion in conjunction with an incomplete phylogeny. Agreement of these eight species as focal species required no further discussion because they fitted both primary and secondary criteria.

The remaining four species (highlighted in Table 1) required further discussion, focusing particularly on the secondary criteria, until two species were selected to complete the 10 focal species list.

Table 1: Summary of the 12 Coral Species Identified as Potential EDGE Focal Species:
The first 10 species listed below are the final ten EDGE focal species selected for immediate conservation attention. Eight of these species (not highlighted) were independently selected by both working groups, where as each of the highlighted species were put forward by just one group and required further discussion.

Focal Species	IUCN Listing (GE)	ED Score: Group A	ED Score: Group B	Average ED
Anomastraea irregularis	VU	3	4	3.5
Dendrogyra cylindrus	VU	3	4	3.5
Heliofungia actiniformis	VU	3	4	3.5
Horastrea indica	VU	3	4	3.5
Parasimplastrea sheppardi	EN	3	3	3
Catalaphyllia jardinei	VU	3	3	3
Dichocoenia stokesii	VU	3	3	3
Physogyra lichensteini	VU	3	3	3
Ctenella chagius	EN	2	4	3
Acropora palmata	CR	2	2	2
Moseleya latistellata	VU	2	3	2.5
Oculina varicosa	VU	3	2	2.5

5.i. Detailed Evaluations of the 12 potential EDGE focal species
The key discussion points relating to each of the 12 potential EDGE focal species, reflecting the knowledge and expertise of workshop participants, were as follows:

Anomastraea irregularis
Regarded as highly evolutionarily distinct as it is a monospecific genus. Its closest relative is also a monospecific genus. Listed as Vulnerable and considered relatively common in the Gulf of Aden but rare throughout its range in the rest of the Indian Ocean. Found in intertidal and marginal systems.

Dendrogyra cylindrus
This species belongs to an evolutionarily distinct genus, and the family, Meandrinidae, consists of just 10 species. The genus is monospecific and relatively basal in its group (Clade 12; Fukami *et al,* 2008). Listed as Vulnerable, with a restricted range in the Caribbean region. Colonies form interesting pillar-like structures.

Heliofungia actiniformis
This species has a basal lineage within the Fungiidae, is monospecific, and is only closely related to one other species. *Heliofungia actiniformis* is commonly targeted for the aquarium trade but does not survive long in captivity, and is one of the reasons it is listed as Vulnerable on the IUCN Red List. Potential conservation actions include the opportunity to influence a simple change in collecting practice, e.g. size at collection, & asexual propagation, which could significantly relieve the pressure of collection. This species is very distinct in morphology and supports many associated symbionts, including brightly coloured shrimps of the genus *Periclimenes* and a species of pipefish *Siokunichthys nigrolineatus*.

Horastrea indica
Regarded as highly evolutionarily distinct as it is a monospecific genus only related to another monospecific genus. Listed as Vulnerable, this species is rare in the field but abundant in the aquarium trade. *Horastrea. indica* has some interesting traits; it survives on high sediment reefs and is a free-living species.

Parasimplastrea sheppardi
There are only a few species in this group and they are very distinct from one another. The group is currently under taxonomic review. *Parasimplastrea sheppardi* is listed as Endangered, and has higher abundance adjacent to islands such as the Seychelles and Madagascar, but is also located in key sites in Oman and Yemen. It maybe difficult to find appropriate scientists to collaborate with in Yemen, however marine research could be carried out there with the Fellow being based elsewhere. Raising awareness and educating in the community would be also be a priority in the countries noted above, but this would be logistically and politically difficult.

Catalaphyllia jardinei
This species is considered evolutionarily distinct as it belongs to a monotypic genus and a paraphyletic family. It has a long fossil history dating back to the Eocene. Although it is not assessed in Fukami *et al* (2008), molecular studies have been carried out on this species so we can be relatively confident of its placement on the Scleractinian tree. The species is listed as Vulnerable and to the best of the group's knowledge is never abundantly found. It is targeted for the aquarium trade and there is an EU wildlife trade restriction on specimens originating from the Solomon Islands. It is also known to be traded from New Caledonia and Indonesia. The species is not a significant reef-builder but can serve as a founder substratum for reef-formation. *Catalaphyllia jardinii* is predominantly found in seagrass beds that are closely associated with reef areas. It is relatively easy to quantify population size and the species is easy to age, making it is a good candidate for research and conservation action. A larger-scale phylogeographic study would be possible with samples from Solomon Islands, New Caledonia and Indonesia.

Dichocoenia stokesii
Although currently listed as two separate species, *D. stokesii* and *D. stellaria* are most probably one species. The genus is considered evolutionarily distinct, to a slightly lesser extent than *Dendrogyra cylindrus*. The species is listed as Vulnerable; currently its range is restricted to the

Western Atlantic Ocean. There are other species of *Dichocoenia* that are now extinct but previously lived in the E. Pacific.

Physogyra lichtensteini
This species is located in a small clade on a long evolutionary branch (Clade XIV; Fukami *et al*, 2008) and within that group the species are well separated and very different. Listed as Vulnerable, *P. lichtensteini* is commonly used in the aquarium trade. It is abundant on the north coast of Aldabra, Seychelles where there is a Marine Protected Area, and here *P. lichtensteini* is known to be eaten by hawksbill turtles. Aldabra presents a good potential location for a Fellow, possibly in collaboration with the Seychelles Island Foundation. The species range is widespread through out the Indo-Pacific, presenting many good potential project locations e.g. Indonesia, Malaysia & the Philippines. Many associated symbiotic shrimp & gastropod species e.g. *Vir smiti*, and *Vir longidactylus*.

Ctenella chagius
This species does have some fairly closely related species in the same clade but was still considered to have an above average ED. It is listed as Endangered on the Red List and found only in the Chagos Archipelago (the British Indian Ocean Territories & Mauritius). There is an existing MPA around Diego Garcia, the only inhabited island of the British Indian Ocean Territories, but currently there is no way of monitoring its effectiveness so its conservation impact is unknown. The proposed large-scale Chagos MPA would extend protection to 100% of the reef (and this species' range) at present. A project on this species would be both timely and would benefit from the good links which exist between members of the Chagos Environment Network (Members include: Chagos Conservation Trust, Linnean Society, Pew Environmental Group, Royal Society, Royal Botanic Gardens Kew, Marine Conservation Society, Royal Society for the Protection of Birds, Zoological Society of London and Professor C Sheppard of Warwick University) and therefore presents a good opportunity to build in protection for this species. Professor C Sheppard (Warwick University) is the Lead Scientific Advisor for Chagos and is part of the broader working group on EDGE Corals (only unable to attend as he was in Chagos at the time).

Acropora palmata
Despite the Acroporidae being a speciose group, the family is relatively basal in the Scleractinia, and *A. palmata* is relatively basal within the group; this species dates back to the Eocene in the fossil record. It is one of only two *Acropora* species in the Caribbean region (three species if *A.prolifera* is considered, but many consider this a hybrid), which diverged from the other Acroporids at least 45 million years ago. The species is listed as Critically Endangered on the Red List. It was considered an extremely important reef builder in shallow Caribbean waters until the 1980s, when widespread mortality of the species occurred, predominantly due to disease. Now only small colonies remain. The species is regarded as iconic and charismatic due to its unique branching structure and importance in topographic diversity and associated symbionts e.g. cardinal fish. It was agreed that a Fellow for this species should also aim to encompass *A. cervicornis* in their work due to the species' similar range and status. Although some conservation actions and MPA designations already aid protection of both species, much more needs to be done, and many opportunities for this were identified notably in The Cayman Islands and Jamaica. No MPAs currently target this species. See Appendix I for more detail.

Moseleya latistellata
Despite currently being placed in a monospecific genus, no molecular studies have been carried out to date and there is much debate as to its place on the Scleractinian tree. It is thought likely that the species ED is quite low as it was thought to be part of the Faviidae group, a very speciose clade. Listed as Vulnerable. It was agreed that this would be a good candidate for further phylogenetic research but should not be a focal species.

Oculina varicosa
Much debate ensued regarding this species' evolutionary distinctiveness. There are currently 16 species in the Oculinidae family and 6 in the genus Oculina. It was suggested that it might be

relatively distinct due to different life histories among species in the genus. However, according to the fossil record, there are 9 related species of Oculina dating back to the Eocene. Many members of the workshop agreed that the whole family requires further research into its phylogeny. Listed as Vulnerable on the Red List, but due to disagreement regarding the species evolutionary distinctiveness the decision was made to not at this time include this species in the final list of 10 focal species.

Having reviewed these 12 species, workshop participants then revisited coral species that were a) most endangered and b) most evolutionary distinct to ensure no species had been missed in the selection process.

5.ii. Critically Endangered Scleractinia Species

There are six Scleractinia species listed as critically endangered on the IUCN Red List. One of these species *A. palmata* was on the original shortlist and therefore already evaluated. Due to these six species being considered as very highly threatened, and therefore scoring highly on the 'GE' side, it was thought appropriate to discuss their evolutionary distinctiveness to establish whether they may also be potential EDGE species (summarised in Table 2).

It was decided that conservation actions towards *A. cervicornis* would be encompassed by focusing on *A. palmata*, and that the remaining four Critically Endangered species did not fit the criteria for EDGE focal species. It was also noted that two of the species (*Rhizopsammia wellingtoni, Tubatrea floriana*) would be good candidates for further phylogenetic research *(Action point)*.

Table 2: Summary of Evolutionary Distinctiveness of Critically Endangered Corals, when considered as candidates for EDGE Focal Species

Species	IUCN Listing	ED Considerations
Acropora cervicornis	CR	The Fellow working on *A.palmata* would encompass this species also
Porites pukoensis	CR	Not considered to be evolutionarily distinct as belongs to a speciose group
Rhizopsammia wellingtoni	CR	Thought to be endemic to the Galapagos, further research required to establish it if it evolutionarily distinct. A potential research Fellow in the Galapagos Islands could study both this and *T.floriana* (below)
Siderastrea glynni	CR	Not considered to be evolutionarily distinct as belongs to a speciose group
Tubastrea floriana	CR	Thought to be endemic to the Galapagos, further research required to establish if it is evolutionarily distinct.

5.iii. Evolutionarily Distinct Species List

All species identified as having above average ED scores (scoring 3 or 4) were listed and discussed further with the whole group (see Table 3). The most evolutionarily distinct species will be highlighted on the EDGE website (www.edgeofexistence.org) as species representing exceptionally high levels of evolutionary history. Those that are not currently threatened would be highly likely to become EDGE priority species should their extinction risk increase.

Table 3: Summary of species identified as ED Species with IUCN priority listings. Species highlighted in grey are additions to the original shortlist. The * highlights the focal EDGE species. ED considerations can be viewed in the evaluation table of all candidate species (Appendix I).

Species	IUCN Listing	ED Scores Group: A	B	Final ED Score
*Ctenella chagius**	EN	2	4	4
Diploastrea heliopora	NT	4	4	4
Pseudosiderastrea tayami	NT	2	4	4
Trachyphyllia geoffroyi	NT	2	4	4
Montastrea cavernosa	LC	4	4	4
Oulastrea crispata	LC	4	3	4
Manicina areolata	LC	1	4	4
Schizoculina fissipara	DD	1	4	4
Stylaraea punctata	DD	2	4	4
Schizocolina africana	DD	1	4	4
*Parasimplastrea sheppardi**	EN	3	3	3
*Anomastraea irregularis**	VU	3	4	3
*Dendrogyra cylindrus**	VU	3	4	3
*Heliofungia actiniformis**	VU	3	4	3
*Horastrea indica**	VU	3	4	3
*Catalaphyllia jardinei**	VU	3	3	3
*Dichocoenia stokesii**	VU	3	3	3
*Physogyra lichtensteini**	VU	3	3	3
Oculina varicosa	VU	3	2	3
Plesiastrea devantieri	NT	3	2	3
Acanthastrea hillae	NT	3	-	3
Blastomussa wellsi	NT	3	3	3
Micromussa amakusensis	NT	3	-	3
Blastomussa merleti	LC	3	-	3
Coeloseris mayeri	LC	3	3	3
Plesiastrea versipora	LC	3	2	3
Stephanocoenia intersepta	LC	3	3	3
Simplastrea vesicularis	DD	3	3	3

Of these ED species, those species listed as Data Deficient on the Red List were highlighted as species for which research into extinction risk is a high priority. These species represent an exceptional level of evolutionary history, but their conservation status is unknown and threats have not been assessed. These species are identified in the Evolutionary Distinct but Data Deficient list (ED-DD; Table 4).

It was concluded that the ED DD list would feed into the next IUCN Coral Specialist Group meeting, for compilation of data to assist IUCN Red List assessments or to initiate further research. When this process is completed these species currently assessed as Data Deficient can be considered as future EDGE focal species for immediate conservation actions, if they are threatened. It may also be appropriate to assign 'Research Fellows' to these ED species, funding dependent, to help establish their extinction risk *(Action point).*

Table 4: Summary of species identified as ED DD Species.

Species	Red List Status	ED Scores A	ED Scores B	Final ED Score	Considerations
Schizoculina fissipara	DD	1	4	4	From a derived & speciose group but considered a living fossil. Focused research efforts on this species should also include research on *S. africana* which is also listed as DD.
Stylaraea punctata	DD	2	4	4	Currently the only species in the genus. Morphologically distinct, the size of pea. Found in the intertidal zone. Probably climate change vulnerable.
Simplastrea vesicularis	DD	3	3	3	Possibly belongs to clade XIV in a small family. Further research required.
Mussismilia braziliensis	DD	1	2	2	In a relatively derived & speciose group but the genus needs significant further research and is important as it is representative of the whole American reef system. Any research into this species should also include research into *M. hispida* & *M. hartii.*

5.iv. Key Outputs

The vigorous evaluation of all candidate species discussed in this section produced three key outputs:

a) Ten focal EDGE Scleractinian species (Table 5) currently receiving little or no conservation attention, for which conservation action will be initiated through the EDGE Fellows programme.
b) Four ED DD species (Table 4), which represent an exceptional level of evolutionary history, but their conservation status, is unknown and threats have not been assessed. Research into the extinction risk of these species is therefore a high priority.
c) ED species list (Table 3) - Scleractinian species with above average Evolutionarily Distinctiveness which are not currently threatened according to their IUCN Red List status. These species will be highlighted on the EDGE website and may become EDGE priority species in the future should their extinctive risk increase.

Table 5: The Ten focal EDGE species.
Average ED is calculated from Working Group A & B's ED score.

Focal Species	IUCN Listing (GE)	Average ED
Anomastraea irregularis	VU	3.5
Dendrogyra cylindrus	VU	3.5
Heliofungia actiniformis	VU	3.5
Horastrea indica	VU	3.5
Parasimplastrea sheppardi	EN	3
Catalaphyllia jardinei	VU	3
Dichocoenia stokesii	VU	3
Physogyra lichensteini	VU	3
Ctenella chagius	EN	3
Acropora palmata	CR	2

6. The EDGE Fellows Programme

The EDGE Fellows programme aims to initiate the development of long-term sustainable conservation projects for focal EDGE species. By supporting and training in-country conservationists and developing their skills to conserve local biodiversity, the programme aims to increase conservation capacity and achieve sustainable conservation projects for EDGE species and their associated habitats.

To date, 17 aspiring conservationists from 12 different countries have been supported through the EDGE Fellows programme to work on top priority EDGE mammal and amphibian species (www.edgeofexistence.org). ZSL provides financial, technical and institutional support for individuals to carry out a conservation project in one of three categories. Fellows either:

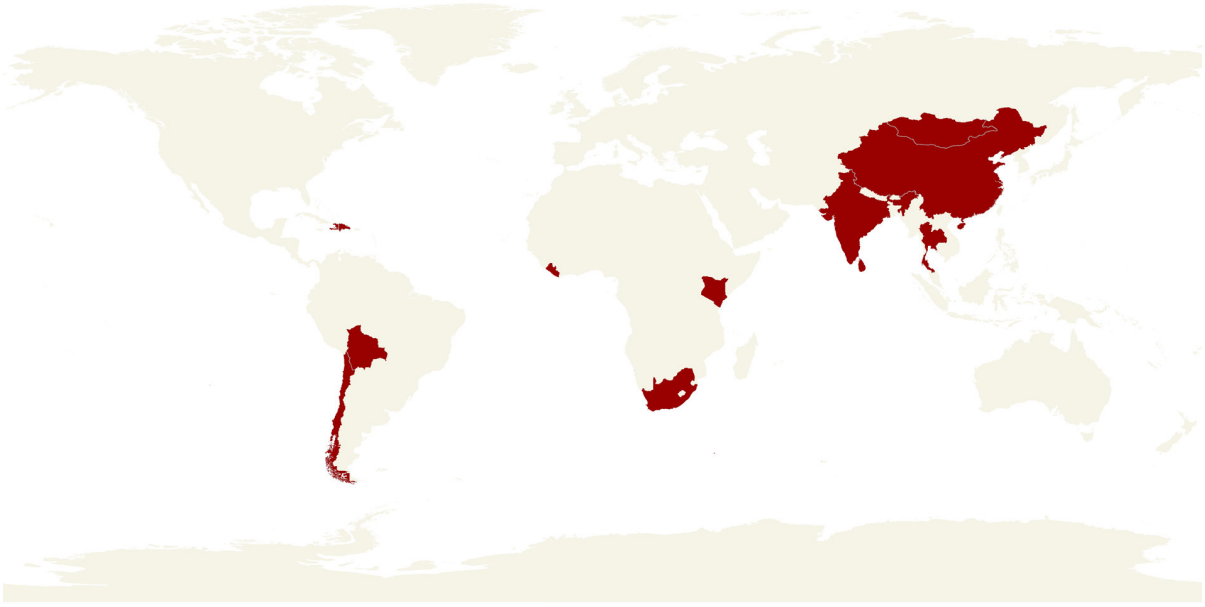
- Carry out a novel piece of conservation research;
- Develop a species conservation strategy; or
- Implement a targeted conservation action.

ZSL provides EDGE Fellows with guidance in planning and implementing their projects, ongoing technical advice, field training from ZSL experts, intensive training at a two-week course in London, assistance with proposal-writing, and funding to support their project. Projects generally last for up to two years, and Fellows may reapply for further funding (in the same or a different category) on completion.

The EDGE Fellows programme is currently expanding to incorporate projects for priority EDGE species in new taxa, including corals, birds and sharks.

The EDGE of Existence programme has been running for three years and is now beginning to develop long-term conservation projects on focal species. These long-term projects are for high priority EDGE species where Fellows' projects have been carried out and further feasible conservation action has been identified and is within the programmes capacity, e.g. Slender Loris (*Loris tardigradus*) in Sri Lanka.

Figure 1: Locations of EDGE Fellows supported to date.



6.i. Development of the EDGE Coral Reef Fellows programme

Workshop participants agreed that the general structure of the EDGE Fellows programme would apply equally well to coral species as it currently does for the programme's terrestrial taxa. It was discussed how to tailor the specifics of the Fellows programme to the field of coral reef conservation and research. Subjects discussed included feasible locations for fellows, potential areas of research and conservation action, and potential collaborations within and outside the group, summarised in Table 6. Some key characteristics of the focal species were also briefly identified, see Table 6, to aid development of species accounts for the website, which plays a significant role in raising awareness of EDGE species, their threats, and the work of EDGE Fellows. The points covered in this discussion provide a good basis on which to build the EDGE Coral Reef Fellows Programme.

It was agreed that the current categories for EDGE Fellow's projects are broad enough to encompass coral reef conservation and research projects. Many projects would involve SCUBA diving, therefore diving protocols and procedures would have to be carefully planned and include British Health & Safety regulations, and in-country diving protocols. The EDGE Coral Reefs programme would need to ensure that the highest standards of dive practice and safety are followed and should look to increasing in-country capacity in this area where appropriate. Experience and protocols of the workshop participants can be used to develop dive policy and procedures associated with EDGE Fellows *(Action point)*.

It was noted that a strong relationship with an in-country NGO is key to implementing effective projects. Due to the logistics and resources required for coral reef studies, a minimum annual funding level of £5 -8,000 per Fellow would be required.

6.ii. Taxonomy

Confidently identifying hard corals to species level is often problematic, particularly for the relatively inexperienced. Taxonomic skills are extremely important and often a limiting factor in many coral reef studies. An agreed level of taxonomic training will therefore be an essential component of the EDGE Fellows training programme, with the level of training to be decided on a case-by-case basis.

Dr Bert Hoeksema highlighted a planned Taxonomic & Biodiversity workshop to be held in 2011, and suggested that this may be useful for some future Fellows to attend *(Action point).* Dr David Obura suggested that developing a properly referenced coral collection at more national research institutions could be beneficial and of interest to national conservation bodies such as the Kenya Wildlife Service *(Action point).* This was noted as a potential Fellows' project.

6.iii. Training Courses
EDGE Fellows receive training both in the field and at a two-week course at ZSL's London offices. Field training towards the beginning of the Fellowship aims to assist with practical skills and specifics of project planning, while the UK training course, attended towards the end of their Fellowship, focuses on broader skills (not specific to a particular taxon) including fundraising, project management and leadership.

Field training for Coral Reef Fellows will require proximity to a coral reef for basic training in survey methods and developing *in situ* coral species identification skills. It was suggested that regional training courses could be developed for Fellows in 3 regions initially:
- Western Indian Ocean;
- Central America & Caribbean;
- Coral Triangle (Central Indo-Pacific Ocean).

Fellows would attend the training course in the region in which they and their focal species is based. Dr David Obura expressed his interest in being involved in developing a training course for the Western Indian Ocean where four of the focal species are located *(Action point).*

The timing of the regional coral-specific training courses during the two year Fellowships needs to be considered to ensure that all Fellows in that region can attend *(Action point).*

6iv. Focal Species Conservation actions
It was agreed that, while marine protected areas (MPAs) are recognised as excellent conservation tools, they should not be the sole conservation action to be considered. The process of identifying the threats and evaluating the potential conservation actions, including establishing MPAs, should be made on a species-specific basis.

If MPAs are selected as a conservation action then community-based initiatives will be the most appropriate in many cases. Networks of MPAs should also be considered to encompass source reefs and the connectivity of populations of focal species between reefs. This level of population ecology is very useful in reef conservation action planning but is often lacking. Research has been carried out for some species, e.g. *Heliofungia actiniformis,* and could be used as a population ecology case study for a number of focal species. Dr Allen Chen (University of Massey, New Zealand / Academia Sinica, Taipei) was noted as a key expert in coral reef population ecology studies as well as Dr. M. Nyström (Department of Systems Ecology, Stockholm University, Sweden) (*Action point*).

Table 6: Summary of key outcomes on EDGE Coral Priority Species. *The key characteristics are not exhaustive but list only those characteristics highlighted in the workshop; full species accounts for each species will be developed in due course.

Focal Species	***IUCN***	**Range**	**Potential In Country Focus**	**Key Contacts**	**Key Characteristics ***
Anomastraea irregularis	*VU*	West Indian Ocean	Madagascar, Seychelles, Maldives, Tanzania, Mozambique, Kenya	Dr David Obura, WIOMSA, Dr John Turner, Maldives University, Dr David Smith	Golf ball like, brown
Dendrogyra cylindrus	*VU*	West Atlantic Ocean	Belize & other Central American countries, Curaçao	Prof James Crabbe, WCS, Dr John Turner, Smithsonian, Belize University, Alasdair Harris - Blue Ventures, Dr Annelise Hagan- SEA	Pillar structure, capable of forming large structures.
Heliofungia actiniformis	*VU*	Central Indo-Pacific	Indonesia	Dr David Smith, Dr Bert Hoeksema	Distinctive looking, anemone-like, many associated symbionts including a species of pipefish, bright coloured shrimp and snail species
Horastrea indica	*VU*	West Indian Ocean	Tanzania, Kenya, Madagascar	Dr David Obura, WIOMSA, Dr John Turner, Maldives University	Large corallites, round, survives in high sediment reefs
Parasimplastrea sheppardi	*EN*	West Indian Ocean	Madagascar, Yemen, Oman, Seychelles	Dr David Obura, Dr Francesca Benzoni, Dr David Smith, Seychelles Island Foundation/ Earthwatch	Colourful
Catalaphyllia jardinae	*VU*	Indian & West Pacific Ocean	Indonesia, New Caledonia, Solomon Islands	Dr Francesca Benzoni, Dr Bert Hoeksema, Dr David Smith, Serge Andrefouet (New Caledonia)	Beautiful, long tentacles, colourful, associated symbiotic shrimps,
Dichocoenia stokesii	*VU*	West Atlantic Ocean	Belize & other Central American countries, Curaçao	Prof James Crabbe, Michelle Taylor, Blue Venture, WCS, Dr John Turner, Smithsonian, Belize University, Alasdair Harris -Blue Ventures, Dr Annelise Hagan - SEA	No notable characteristics useful to raise awareness of the species
Physogyra lichtensteini	*VU*	Indian & West Pacific Oceans	Aldabra, Indonesia, Maldives, Philippines	Seychelles Island Foundation, Dr Heather Koldewey, Dr Bert Hoeksema, Dr David Smith	Turtles feed on this species, bubbly in appearance, many associated symbiont shrimp & gastropod species

Ctenella chagius	*EN*	Central Indian Ocean	Chagos Archipelago	Chagos Conservation Trust, Dr John Turner, Rachel Jones, Dr Heather Koldewey, Prof Charles Sheppard	Brain coral
Acropora palmata	*CR*	West Atlantic Ocean	Cayman Islands, St Croix, Jamaica, Curaçao	Dr John Turner, Prof James Crabbe,	Iconic species. Unique branching pattern, can form large structures, focus on the extensive structures of this species that used to be dominant in its range, associated fish species.

7. EDGE Zones

The EDGE zones approach would enable the identification of coral reefs, which are 'hotspots' of evolutionary distinctiveness and global endangerment. This has been achieved for the mammal and amphibian programmes by mapping the distribution of species that are both evolutionarily distinct and globally endangered (EDGE). These hotspots are then compared to existing approaches used to identify areas of high importance, as they may not be currently under protection or recognised as priorities by other schemes.

Participants were enthusiastic about the concept and agreed that this should be pursued when the Scleractinian phylogeny is further developed. At this point in time, it was felt that there was insufficient information available to develop EDGE zones for corals, over and above what has already been done in identifying the Coral Triangle. Progress in Professor J.E.N. Veron's work constructing a Coral Geographic tool may also provide information allowing the development of the EDGE Zones concept in the future.

8. Research Agenda Development

In two working groups participants discussed key gaps in knowledge that could realistically be addressed through the programme's research agenda to facilitate the conservation of EDGE Scleractinian species and identified how this could best be approached.

8.i. Scleractinian Phylogeny & Time based Tree

The continued development of a robust Scleractinian phylogeny is paramount to enabling the identification of evolutionary distinct species that are highly threatened, and therefore need to receive conservation attention. The group's discussion session on the progress of Scleractinian phylogeny research and how it may be appropriate for the EDGE coral reef project to support this research is summarised in table 7 below.

Table 7: Summaries the Scleractinian Phylogeny research discussion

Research topic	Key Discussion points/ Ongoing Research	Questions to be answered	Key Researchers	Actions Points
Long Term: Scleractinian Phylogeny & Time based Tree	The Scleractinian Working Group (SWG) comprises of international scientists each working on the phylogeny of various Scleractinian genera; the group was formed following a workshop in Washington in 2009. Some members SWG who were present at the workshop stated that a relatively complete fossil and time-based Scleractinian phylogeny should be available within the next 5 years. The development of a relatively robust Scleractinian phylogeny will eventually allow us to run EDGE score simulations, with the aim of producing increasingly precise ED scores in line with standard EDGE methodology.		SWG members	
Medium term: Scleractinian Phylogeny & Time based Tree	Dr Bert Hoeksema, Dr Francesca Benzoni and Dr Arjan Gittenberger are all currently undertaking research on various Scleractinian families which should result in the robust identification of the evolutionarily distinctiveness of species within these families. Many small families not yet being researched e.g. *Trachyphyllidae* The EDGE Coral Reefs Coordinator or a research student could also be instrumental in facilitating the process by liaising between researchers and identifying gaps in research In addition to molecular studies, it is extremely important to incorporate species morphology and key characteristics between families.		Dr Bert Hoeksema, Dr Francesca Benzoni, Dr Arjan Gittenberger Dr Allen Chen and Dr Hironubo Fukami were also identified as key researchers working on Scleractinian phylogeny who were unable to attend the EDGE workshop. Dr Nancy Budd (Iowa State University) key researcher in species morphology and key characteristics between families Dr Jarek Stolarski (Institute of Paleobiology, Polish Academy of Sciences)	Contact Dr Jarek Stolarski and Dr Nancy Budd for their input on the project Compile list of ongoing research from participants and others. Perhaps co-ordinate through SWG. Identifying gaps in research will be facilitated by a compiling list of ongoing research.

Short Term: Scleractinian Phylogeny & Time based Tree	The availability of samples for analysis is often a limiting factor in developing coral phylogeny, as sample collection is costly, time-consuming and logistically complex. EDGE Fellows could contribute by providing samples for analysis. This would require a good level of coral ID skill, albeit only for the focal species in question. Dr Rosemarie Baron-Szabo's reported that she is a co-author on a recently submitted paper that provides a time-based phylogeny for part of the Scleractinian tree. Data is available on GenBank and it may be feasible to produce a broad tree from this data. However, a limitation is the accuracy with which species were identified, recorded by individuals and the range of methodologies applied within the GenBank database. For these reasons data from this source have not yet been analysed.		Dr Rosemarie Baron-Szabo	Investigate the possibility of Fellows' providing species samples for key researchers analysis.

8.ii. Baseline & Conservation Biology of Focal, ED, & ED DD Species

There is a marked lack of knowledge of the basic ecology, physiology and life histories for many of the focal, ED, and ED DD species. The workshop highlighted the need for a significant amount of research on many species in order to ensure effective conservation actions can be implemented. Many of the EDGE species requiring further research were identified in Section 5.

EDGE Fellows would first need to conduct a comprehensive literature search on their focal species, with support from ZSL project personnel, to identify in more detail the knowledge gaps for that species. Once any knowledge gaps in the species baseline biology have been identified it may be beneficial for the EDGE Fellow's 2-year project to focus on this area of research if it is thought to be key to implementing effective conservation actions in the longer- term. Alternatively, EDGE Fellows maybe able to focus on a key area of conservation biology relevant to the focal species if there is already adequate knowledge of a species' baseline biology. The group discussion highlighted key areas of baseline and conservation biology, summarised in Tables 8 & 9 below, which will facilitate the planning of EDGE Fellows' work on focal species.

Table 8: Baseline Biology Research of Focal, ED & ED DD Species: Key areas of potential research for Fellows' projects.

Research topic	Key Discussion points/ Ongoing Research	Questions to be answered	Key Researchers	Actions Points
Population ecology	Research maybe required into type and time of spawning, sexual maturity dynamics, asexual			

	reproduction dependency, life history, fecundity and recruitment.			
Phylogeography/ Population genetics	Investigating the connectivity between populations on a range of scales from small islands to entire continents. This would require sequencing, and microsatellite markers would be needed, making this a longer-term, postgraduate or post-doctoral scale project. Phylogeography/genetic research across species ranges is considered a priority research aspect. (See *section 6iv* also) Should include studies into variations in species zooxanthellae clades across populations. *Dendrogyra cylindrus* would be a good candidate for this field of research.			Investigate incorporating phylogeography research needed for individual focal & ED species by post-graduates into the programme's research agenda.
Historical ecology	Predominantly collection research, and investigating the relative abundance of a genus over time e.g. there are many photos of the abundance of *A.palmata* over the last few decades (including John Ogden photos from the Caymans in 1974).	It would be interesting to compare the geographical distribution of monospecific genera to speciose genera as it would appear there are many monospecific genera in the Western Indian Ocean, leading to the question; has this been a refuge from factors affecting the 'boom and bust' of populations over time?	Dr John Ogden (photos of *A.palmata*)	
Ecology	Ecological interactions, e.g. competition for light & space, fine-scale abiotic factors affecting distribution, recruitment of zooxanthanellea e.g. cladal & maternal, autotrophic & heterotrophic nutrition, and the species symbiotic associations.			

Causes of mortality	Predators, disease, competition, susceptibility to bleaching and other climate change stressors, and local anthropogenic threats e.g. documenting the aquarium trade and water quality. Evaluating local and global threats is clearly essential to successful conservation measures, and will be important for all focal species.	If an adequate threats assessment has not been carried out on the species this can be included in the Fellows' remit.		Ensure threat assessments are included, when appropriate for a focal species, in the EDGE Coral Reef Fellows strategy.
Species Abundance & Vulnerability	Species abundance and vulnerability research/ assessments into those species identified as ED DD (Table 4) are a high priority. This information can then be fed back into the Red List process enabling the specialist group to allocate species a conservation priority status.			Encompass in the programme's research agenda.
Reference Collections	Developing reference collections in EDGE site countries, discussed in *section 6ii*, was identified as important and often a limiting factor in coral research. This has potential as a Fellow's project or a component of a Fellow's project but would require some taxonomic training. - Good photographs of species are an important element of reference collections. This may involve collating existing photos e.g. Arkive, Encyclopaedia of Life (EOL), and taking photos. - Skeletal & DNA samples		Dr Bert Hoeksema, Dr Ken Johnson, Dr Arjan Gittenberger	Investigate feasibility for Fellows' projects.

Table 9: Conservation Biology Research of Focal, ED & ED DD Species: Key areas requiring research.

Research topic	Key Discussion points/ Ongoing Research	Questions to be answered	Key Researchers	Actions Points
The Coral	Work to improve the effectiveness of CITES and other trade	- How are quotas for		

Trade	regulations for hard corals, particularly for the focal species; *Catalaphyllia jardinae, Heliofungia actiniformis*, and *Physogyra lichtensteini* which are all targeted by the aquarium trade. Education and outreach work in local communities would also be a key component.	collection arrived at and how this can be improved? - How can the sustainability of the aquarium trade be improved? Examine collection site management, methods of collection, handling and shipment. - Investigate ways to reduce by-catch from the trade.		
IUCN Red List	A potential area of very important and topical research would be to investigate focal species vulnerability to climate change. This would compliment the IUCN's work identifying species traits that are linked with potential resilience to climate change. It was also suggested by Dr. David Obura that any research carried out on EDGE focal species, ED species or ED DD, particularly on population estimates, evolutionarily distinctiveness, and distribution, can be fed back into Coral Specialist Group meetings to update the Red List. Fellows' work carried out on the focal species could also potentially be used as case studies to reassess the real status of Scerlactinian corals.	- Population estimates & distribution for species where this data is not already available. - Investigating focal species vulnerability to climate change	Wendy Foden (WCMC). Dr David Obura (IUCN Red List Coral Specialist Group Chair)	- Contact Wendy Foden (WCMC).
Marine Protected Areas (MPAs)	In addition to the long-term goal of establishing an MPA for every focal species and their habitat where appropriate, it would also be beneficial to assess the effectiveness of any existing MPAs that are located in the species' range. Fellows could work to provide recommendations to improve MPAs protection of focal species if necessary, e.g. *Physogyra lichtensteini* located within the Aldabra MPA, Seychelles. Recommendations may include improving enforcement and implementing outreach programmes in the region.	- Do existing MPAs located within a focal species range afford protection for focal species?		

	Implementing outreach programmes can also be an effective means of protecting a species and its habitat in its own right.			
Evaluating a species based approach	Investigating the effectiveness of a species-based conservation approach to coral reef conservation is another potential avenue of research. However, this maybe a longer term project for the future.			

9. Conclusion & Acknowledgments

By achieving the desired outputs, identified in section 3ii, the workshop has greatly contributed towards the development of the EDGE Coral Reef Programme. The focal species were identified through a vigorous analysis of candidate species by international coral experts, providing a strong scientific underpinning to the programme. The majority of the focal species were independently selected by both workshop working groups as EDGE focal species, which strongly supports the use of expert opinion in conjunction with an incomplete phylogeny to implement the EDGE method.

Workshop discussions have also catalysed the development of the EDGE Coral Reef Fellowship programme through which conservation measures for focal species will be initiated. The programme's research agenda will be developed to address some of the key knowledge gaps identified in the workshop, which will enable the implementation of appropriate conservation measures for high priority EDGE species and will support the development of a robust Scleractinia phylogeny. The development of the full Scleractinian phylogeny will eventually allow us to run EDGE score simulations, with the aim of producing increasingly precise ED scores in line with standard EDGE methodology in the future.

We thank workshop participants for their time and invaluable expertises, both during and in the lead up to the workshop, and also those who contributed remotely. We now aim to further build effective collaborations with workshop participants and to work with other contacts where identified. Specific action points identified throughout the report and summarised in Table 10, will be followed up to aid the development of the programme.

Table 10: Summary of Action Points from the workshop

Reference	Action Points
Section 5ii & Table 8	Two Critically Endangered species (*Rhizopsammia wellingtoni, Tubastrea floriana*), identified in Table 2, would be good candidates for further phylogenetic research. Investigate feasibility of incorporating into the programme's research agenda.
Section 5iii & Table 8	Ensure ED DD Species abundance & vulnerability research is encompassed in the programme's research agenda.
Section 6i	Develop a standardised dive policy and procedures strategy for the EDGE Coral Reef Fellowship programme.
Section 6i	Follow up Dr Bert Hoeksema suggestion that the Taxonomic & Biodiversity workshop to be held in 2011, may be useful for some future Fellows to attend.
Section 6ii & Table 8	Dr David Obura suggested that developing a properly referenced coral collection at more national research institutions could be beneficial and of interest to national conservation bodies such as the Kenya Wildlife Service. Investigate the feasibility of this idea for Fellows' projects.
Section 6iii	Follow up with Dr David Obura on potentially collaborating to develop a Fellows training course for the Western Indian Ocean where four of the focal species are located.
Section 6iii	Consideration will be given to the timing of the regional training courses during the two-year Fellowships.
Section 6iv	Possibly contact Dr Allen Chen regarding potential research on coral reef population ecology studies on focal & ED species.
Table 7	Contact Dr Jarek Stolarski (Institute of Paleobiology, Polish Academy of Sciences) and Dr Nancy Budd (Iowa State University) for their input on the programme.
Table 7	Compile list of ongoing research from participants and others. Perhaps co-ordinate through SWG. Identifying gaps in research will be facilitated by compiling a list of ongoing research.
Table 7	Investigate the feasibility of Fellow's providing species samples for key researchers as the availability of samples for analysis is often a limiting factor in developing coral phylogeny
Table 8 & Section 5ii	Investigate incorporating phylogeography research needed for individual focal & ED species by post-graduates into the programme's research agenda.
Table 8	Ensure threat assessments are included in the EDGE Coral Reef Fellows strategy where appropriate for focal species.
Table 9	Contact Wendy Foden (WCMC) to discuss IUCN coral climate change susceptibility traits studies and how the programme's research agenda and/or Fellow's projects can feed into and develop this work.

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Appendices:

Appendix I: Evaluation table of all the candidate species
Appendix II: Participant list & wider consultee group
Appendix III: Working group A & B lists
Appendix IV: Primary & Secondary criteria
Appendix V: Summary chart of evaluation process
Appendix VI: Candidate Coral Information provided by Professor J.E.N Veron
Appendix VII: Workshop Agenda

Appendix I: Evaluation of All Candidate Species; Shaded cells represent the 12 selected EDGE focal species candidates

Key: Geographical Regions	***Key: ED Scoring***
WI = West Indian Ocean EI = East Indian Ocean WCP = West and Central Pacific EP = East Pacific WA = West Atlantic EA = East Atlantic CIP = Central Indo Pacific IWP = Indian Ocean & West Pacific	0 = Not ED 1 = lowest 2 = medium low 3 = medium high 4 = high NE = not evaluated ? = Tentative: not enough information to make an informed decision.

Main Group	Genus	Species	Red List Status	Geographical Range	ED Score Group A	ED Score Group B	Primary Criteria	Secondary Criteria
Hydrozoa	*Distichopora*	*vervoorti*	N/A	CIP			Eliminated independently by both working groups on the basis that it would be very difficult to access the reef-building coral outgroups.	
Hydrozoa	*Millepora*	*boschmai*	CR	IWP				
Octocorallia	*Heliopora*	*coerulea*	VU	IWP				
Octocorallia	*Tubipora*	*musica*	NT	IWP				

Scleractinia	*Acropora*	*palmata*	CR	WA	2	2	First simulation of ED by Dr Dave Redding placed it as the 129th/181 with regards to ED but this is based on an incomplete tree so controversial. Although *Acroporas* are a speciose group, this species is fairly basal in *Acropora* group, has a fossil record to Eocene, and is one of only three Caribbean *Acroporas*. Very threatened- has the highest threat status. Discussion as to why this was chosen over *A.cervicornis* (also CR); equivalent ED to *A.cerviconis*, possibly separate for 45 million years but has unique branching structure &'iconic'.	Charismatic, topographic diversity, many symbionts i.e. cardinal fish, is 'iconic', has unique branching structure & a compelling story because there used to be 'fields' of *A. palmata* but now only smaller colonies. Dr David Obura - existing MPA in St Croix not specifically set up for this species, but they are taking some action for *A. palmata*. Curaçao - people working there. Prof James Crabbe has contacts in Jamaica; Dr John Turner - Cayman Islands (Darwin Initiative Project) - project to extend MPA system to 30% of the shelf so opportunity to build in conservation here. In Caribbean is good structure and enforcement system for successful conservation work. Fellow could work with both CR *Acropora* species.
Scleractinia	*Acropora*	*arabensis*	NT	WI	2	2	*Acropora* is a speciose group. Its threat status makes this species a low priority for conservation action.	
Scleractinia	*Anomastraea*	*irregularis*	VU	WI	3	4	It is a monospecific genus related to another monospecific genus. Dr Francesca Benzoni had good knowledge of the species. Common in Gulf but rare in the rest of the Indian Ocean.	Intertidal and marginal systems. Might be worth doing a 'call for contacts' with WIOMSA because there is a lot of national and International NGOs in the region.

Scleractinia	*Boninastrea*	*boninensis*	DD	C-IP	?	3	Monospecifc genus although within myrilinnids. No fossil record known so would appear to be young, possibly not a valid genus.	Very rarely seen.
Scleractinia	*Catalaphyllia*	*jardinae*	VU	IWP	3?	3	Monotypic genus in a paraphyletic family, several species in the group have long evolutionary branches. Not on Fukami tree but material is now available so this species could be placed on the tree. This species is never abundantly found. Prof J.E.N Veron's comments: *Catalaphyllia* is usually uncommon throughout most of its range. Very rare in Indonesia and Philippines. It is among the most targeted of aquarium species although this does not in itself constitute a conservation issue as harvested specimens (from the wild) are easily distinguished from cultured specimens and this distinction is enforced by the aquarium trade. It is morphologically close to three species of *Euphyllia*. Occurs in turbid water where it is not susceptible to bleaching.	Conservation actions could be linked to the aquarium trade for which this coral is targeted - there is an EU wildlife trade restriction on this species when from the Solomon Islands, it is also known to be traded from New Caledonia, & Indonesia. This species is not normally a reef-builder, but can serve as a founder substrate for reef-formation. It is normally found in seagrass beds but is always found in association with a reef. It is beautiful, has long tentacles and there are a number of symbiotic shrimp species associated. Feasibility - it is relatively easy to quantify and get population numbers and easy to age. A larger-scale phylogeography study would be possible with samples from SI, NC & Indonesia. This species could be easily joined with *Trachyphyllia* from a fellow's perspective. Excellent site in New Caledonia and is protected under its status as a UNESCO World heritage site
Scleractinia	*Coeloseris*	*mayeri*	LC	IWP	3	3	Some describe it as 2 species but is a monotypic genus. Not included in Fukami tree, but is not closely related to anything in its group. Status as Least Concern makes it a low priority for focal species.	

Scleractinia	*Coscinarea*	*mcneilli*	LC	WCP	2	?	Many species in family, study of microstructure shows it is distinct from relatives in its polyphyletic genus. However, it is closely related to speciose groups. Phylogeny not yet described, but it is very likely to be within a speciose group. LC makes it a low priority for conservation action.	
Scleractinia	*Colpophyllia*	*natans*	LC	WA	1	3	Potentially 3 species in genus and the others may come higher; long fossil record but very large group and not a very basal species. Common Caribbean coral, not aware of specific threats.	
Scleractinia	*Ctenella*	*chagius*	EN	CIP	2	4	This species does have some fairly closely related species in the same clade but a small family. Considered to have an above average ED. Listed as endangered.	The Chagos coral'. There is an existing MPA around Diego Garcia but currently there is no way of monitoring its effectiveness. The recently successful proposal for a large-scale Chagos MPA will extend protection to 30% of the reef (and this species' range) at present. A project on this species would be both timely and have a good link with The Chagos Environment Network including The Chagos Conservation Trust and presents a good opportunity to build in protection for this species.
Scleractinia	*Dendrogyra*	*cylindrus*	VU	WA.	3	4	Distinct genus consisting of 10 species; monospecific and relatively basal in its group. Clade 12 in Fukami. Prof J.E.N. Veron's comments: considers *Dendrogyra* common in the Caribbean. Not considered structurally distinct from Pacific members of the Merulinidae.	Restricted to Caribbean. Interesting structure, can form pillar structures.

Scleractinia	*Dichocoenia*	*stellaris*	DD	WA.	?	?	Eliminated as most do not recognise this as a separate species form *D.stokesii*	
Scleractinia	*Dichocoenia*	*stokesii*	VU	WA	3	3	ID issues with *D.Stokesii* thought to be one species; Similar ED to *D.cylindrus* but considered to be slightly less ED. Fossil records show it used to be found in the Eastern Pacific.	Restricted to Caribbean.
Scleractinia	*Diploastrea*	*heliopora*	NT	IWP	4	4	Very basal with a long independent evolutionary history but NT status makes it a low priority for conservation	Significant contributor to reef building
Scleractinia	*Duncanopsammia*	*axifuga*	NT	C-IP	?	1	Very complex Clade (II in Fukami) Interesting family with different life histories within it, depending on where this species falls it could be rated as a 1 or a 3 on our ED score. Currently insufficient evidence so difficult to place on phylogeny.	'*Turbinaria* gone crazy'
Scleractinia	*Erythrastrea*	*flabellata*	NT	IWP	1?	3	Member of the Favids. Relatives are quite derived in the Indo-Pacific, has many sister species. Despite listing of NT many have not seen this species for a long time.	
Scleractinia	*Euphyllia*	*ancora*	VU	C-IP	1	0	Clade V in Fukami. In a speciose and derived group.	
Scleractinia	*Eusmilia*	*fastigata*	LC	WA.	3	3	Monospecific, similar situation to *Dichocoenia* and *Dendrogyra*. Clade 12 in Fukami. However LC so a low priority for conservation action	

Scleractinia	*Galaxea*	*cryptoramosa*	VU	C-IP	1	1	7 species in genus but 2 not described, none of the species are very distinct; Assume *Galaxea* is monophyletic, but it has many relatives (Fukami Clade V).	
Scleractinia	*Gardineroseris*	*planulata*	LC	IWP	1	3	Monospecifc but low conservation priority.	
Scleractinia	*Gyrosmilia*	*interrupta*	LC	WA	?	3	Monospecific. Appears to have no known fossil record. Insufficient evidence to be confident of its placement.	Usually uncommon.
Scleractinia	*Heliofungia*	*actiniformis*	VU	C-IP	3	4	Has a basal lineage within the fungids, only has one closely related species. Is very distinct in morphology. Prof J.E.N. Veron's comments: *Heliofungia* is very common throughout the central Indo-Pacific. On the Great Barrier Reef it is particularly common on shallow soft substrates where the water is very turbid (it sometimes carpets the substrate). It is not susceptible to bleaching. It is not strongly differentiated from Fungia morphologically (and used to be considered a subgenus of Fungia)	Commonly used in aquarium trade but does not survive long in captivity, opportunity to influence a simple change in collecting practice (e.g. size at collection) which would have a good conservation impact. Amazing anemone-like coral with many symbionts including brightly coloured shrimps and a species of pipe fish.
Scleractinia	*Horastrea*	*indica*	VU	WI	3	4	It is a monospecific genus related to another monospecific genus.	Rare in the field, but abundant in aquaria; Dr David Obura could explore possible sites. Favours mucky sediment.

Scleractinia	*Manicina*	*areolata*	LC	WA	1	4	Clade XXI - belongs to the most derived clade in phylogenetic tree.	Free living, 'a tourist coral'; Restricted to the Caribbean, but common and widespread.
Scleractinia	*Montastraea*	*cavernosa*	LC	WA & EA	4	4	The species is potentially poised to split into 5 species; polyphyletic. Sequence on GenBank seen in different places in phylogeny. Clade XVI - only species Fukami puts in this clade. Status means it is a low priority for conservation.	
Scleractinia	*Montigyra*	*kenti*	DD	IWP - Australia	?	?	Possibly extinct. No information.	
Scleractinia	*Mussa*	*angulosa*	LC	WA.	2	3	Distinct from similar pacific species; relatively derived and has many cousins in clade, however placement is currently being revised.	Restricted to the Caribbean
Scleractinia	*Mussismilia*	*hispida*	DD	WA	1	2	In a derived & speciose group.	Endemic to Brazil. Further research deemed necessary.
Scleractinia	*Mussismilia*	*braziliensis*	DD	WA	1	2	In a derived & speciose group.	Endemic to Brazil. Further research deemed necessary.
Scleractinia	*Mussismilia*	*harttii*	DD	WA	1	2	In a derived & speciose group.	Endemic to Brazil. Further research deemed necessary.
Scleractinia	*Nemenzophyllia*	*turbida*	VU	C-IP	?	2	Fukami puts in Clade V but has not been sequenced making it difficult to place in the tree. Insufficient evidence.	Rare in the field, but abundant in aquaria
Scleractinia	*Oculina*	*varicosa*	VU	WA	3?	2?	Much debate ensued. There are currently 16 species in the Oculinidae family and 6 in the genus *Oculina*. Suggestion that it could be relatively distinct due to different life histories among species in the genus, but the fossil record shows there are 9 related species of *Oculina* dating back to the Eocene. Whole family requires further research into its phylogeny.	

Scleractinia	*Oulastrea*	*crispata*	LC	C-IP	4	3	Placed close to mushroom corals in Fukami tree, still debate over the techniques used; Long branch with no close relatives, very distinct (Clade XI in Fukami). Distinct morphology. Regarded as LC so a low priority for conservation.	Many symbionts.
Scleractinia	*Palauastrea*	*ramosa*	NT	C-IP	2	3	Currently 1 species in the genus but considered similar to *Stylaraea*. Expect more species to be put into this group in the future. Status makes it a low priority for conservation action.	
Scleractinia	*Paraclavarina*	*triangularis*	NT	C-IP	1?	2	In a derived & speciose group.	
Scleractinia	*Parasimplastrea*	*sheppardi*	EN	WI	3	3	Few species in the group and they are distinct from each other but a problematic group which need to be revised. Dr Francesca Benzoni had good knowledge of the species.	Found more abundantly around the islands e.g. Seychelles and Madagascar (a university in southwest; WWF and CI working in region), there are also key sites in Oman and Yemen. In Yemen there is a recent MPA project but logistical problems. Education/outreach work is one idea, but logistically and politically difficult.

Scleractinia	*Physogyra*	*lichtensteini*	VU	IWP	3	3	On a long evolutionary branch (Clade XIV in Fukami) and within that group the species are well separated and very different. Prof J.E.N Veron's comments: *Physogyra* is common from the South Pacific to the Red Sea. It occurs in a wide range of habitats including deep and turbid water where it is not susceptible to bleaching.	Common in aquarium trade, particularly abundant on north coast of Aldabra (Seychelles) where it is eaten by hawksbill turtles. Aldabra is a good potential location for a Fellow e.g. with Seychelles Island Foundation. Also in Indonesia & Philippines. Many associated symbiotic shrimps & gastropods.
Scleractinia	*Plesiastrea*	*versipora*	LC	WCP	3	2	In a small clade and species are distinct from each other but a very problematic group that need to be revised. Status makes it a low priority for conservation action	
Scleractinia	*Plesiastrea*	*devantieri*	NT	WI	3?	2	In a small clade and species are distinct from each other but a very problematic group, which need to be revised. Status makes it a low priority for conservation action	
Scleractinia	*Pocillopora*	*fungiformes*	EN	WI	1?	0	In a derived & speciose group.	
Scleractinia	*Porites*	*pukoensis*	CR	EP -Hawaii	1?	0	In a derived & speciose group.	

Scleractinia	*Pseudosiderastrea*	*tayami*	NT	IWP	2	4	Debate over whether this is a valid species, the family is up for debate and needs revision; In clade IX in Fukami but this is an artificial clade. Closely related to *Siderastrea*. Dr Francesca benzene has a good knowledge of this species. If we leave it in its current clade would have a high ED but this may not be the case.	Found near shore, in often brackish waters
Scleractinia	*Scapophyllia*	*cylindrica*	LC	C-IP	1	2	Located deep in tree; Monospecific genus, but no evidence it would be distinct because has many close relatives.	
Scleractinia	*Schizocolina*	*africana*	DD	EA	1	4	In a derived & speciose group.	
Scleractinia	*Schizoculina*	*fissipara*	DD	EA	1	4	Considered a living fossil; Derived & speciose	
Scleractinia	*Siderastrea*	*glynni*	CR	EP	2	?	Debate if this is a valid species but either way a *Siderastrea* species would be low ED group. Group B thought this was not a valid species	
Scleractinia	*Simplastrea*	*vesicularis*	DD	C-IP	3?	3	Possibly belongs to clade XIV or near to *Galaxia*.	
Scleractinia	*Stephanocoenia*	*intersepta*	LC	WA	3	3	Clade VIII in Fukami, relatively un-derived. Has a fossil record. Small family	
Scleractinia	*Stylaraea*	*punctata*	DD	IWP	2	4	Currently one species in the genus but more species could be added. Morphologically distinct.	Found in the intertidal zone. The size of pea. Probably climate change vulnerable

Scleractinia	*Stylocoeniella*	*cocosensis*	VU	C-IP	2	2	Basal in clade X, but a few species in the genus	Endemic
Scleractinia	*Trachyphyllia*	*geoffroyi*	NT	IWP	2	4	Monotypic genus in a paraphyletic family has long evolutionary branches and a long fossil record from Eocene. Distinctive morphology - is black. Status makes it a low priority for conservation action.	Targeted for the aquarium trade. If a Fellow worked on aquarium trade issues with *Catalaphyllia* then this species could also be encompassed.
Species candidates added during the working groups:								
Scleractinia	*Acropora*	*Cervicornis*	CR	WA	NE	2	Added by Group B: Much discussion & comparison to *A. palmata*. Similar evolutionary history but is not as iconic and does not have unique branching structure unlike *A.plamata*	Much topographic diversity, many associated symbionts i.e. cardinal fish. A Fellow focusing on *A.palmata* could also encompass this species.
Scleractinia	*Acanthastrea*	*hillae*	NT	IWP	3	NE	Added by Group A: Seems on a limb compared with other *Acanthastrae*, diverged from a line of relatively long evolutionary history. Record of it from the Miocene or at least a species very similar to this, if not this species. Molecular phylogeny is very distinct. Needs attention. Status means it is not a priority for conservation action.	
Scleractinia	*Micromussa*	*amakusensis*	NT	IWP	3	NE	Added by Group A: Few close relatives - 3 species off a long line of evolutionary history. Clade XVIII in Fukami. Status means it is not a priority for conservation action.	Very 'pretty' species.

Scleractinia	*Pachyseris*	*spp (5 on Red List)*	2 are VU				Added by Group A: Fukami puts in Clade IV which is relatively basal and only one species in Fukami. However expect other species to fall within this group in the future - there are three at the moment (speciosa & rugosa are long-standing species, but 5 on Red List - this needs revision) and workshop participants doubt where it is placed in Fukami - of the opinion that the groups placement is likely to change with more information. Considered too hard to place on the tree with current information.
Scleractinia	*Blastomussa*	*merleti*	LC	IWP	3	NE	Added by Group A: Only 2 species from a long line of evolutionary history (Clade XIV in Fukami) and those in the same clade are all very distinct from one another. Status means it is not a priority for conservation action. Dr Francesca Benzoni had good knowledge of the species.
Scleractinia	*Blastomussa*	*wellsi*	NT	IWP	3	3	Added by Group A & B: Only 2 species from a long line of evolutionary history (Clade XIV in Fukami) and those in the same clade are all very distinct from one another. Status means it is not a priority for conservation action. Dr Francesca Benzoni had good knowledge of the species.

Appendix II: Participant list & wider consultee group

Workshop Chairs		
Dr. Heather Koldewey	Chair: Marine & Freshwater Department, ZSL	heather.koldewey@zsl.org
Dr. Matthew Gollock	Co- Chair: Marine & Freshwater Department, ZSL	matthew.gollock@zsl.org
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Appendix III: Working Group Participants

Working Group A

Chair: Heather Koldewey
Dr. David Obura
Dr. Kenneth Johnson
Dr. Bert Hoeksema
Dr. Rosemarie Baron-Szabo
Dr. John Turner
Professor James Crabbe
Rachel Jones
Dr. Jonathan Baillie
Dr. David Redding
Catherin Head
David Curnick

Working Group B

Chair: Dr Matthew Gollock
Dr. David Smith
Dr Arjan Gittenberger
Dr. Brian Rosen
Dr Francesca Benzoni
Dr. Simon Harding
Dr. Samuel Turvey
Sally Wren
Helen Meredith

Appendix IV: Primary & Secondary Evaluation Criteria

Primary Criteria

These criteria define the EDGE of Existence Programme and therefore should be given foremost consideration.

Evolutionary **D**istinctiveness

All short listed corals must be deemed *evolutionarily distinct* (ED). Although this can't yet be quantified using standard EDGE methodology (as the current hard coral phylogeny is not well enough established), it is possible to identify likely evolutionarily distinct species using the most comprehensive phylogeny available to date. Many candidate focal species have been inferred from the clade of phylogentic relationships presented by Fukami *et al.* (2008). However, a significant number of coral species and genera were not represented within this analysis (a total of 127 species from 75 genera and 17 families were analysed – please see accompanying paper). Corals on the short list considered to be most evolutionarily distinct should be prioritised as candidates for focal species.

Globally **E**ndangered

The EDGE approach uses the IUCN Redlist as a measure of threat. Only species listed as Critically Endangered, Endangered, or Vulnerable, on the IUCN Redlist have been considered for focal species for existing EDGE taxa. However, an important discussion point for the first session of the workshop will be whether to consider inclusion of Data Deficient listed species as EDGE coral focal species.

Secondary Criteria

Criteria used to identify focal species for other taxa have been reviewed and additional suggested criteria taken into consideration. The following have been proposed as secondary criteria that should be considered after species' ED and GE status during the coral focal species selection process. It is recognised that some of these criteria are interlinked and are subjective to some degree. We welcome suggestions of other secondary criteria before the workshop.

Currently receiving little or no conservation attention

There is evidence of strong taxonomic bias in apportioning global conservation attention. A study proposed by the EDGE of Existence team and developed by colleagues at ZSL's Institute of Zoology (Sitas *et al.* 2009) found that the small number of species receiving substantial attention is extremely biased. Conservation status and evolutionary distinctiveness appear to have little importance in decision-making at the global scale. The EDGE of Existence programme aims to address this huge conservation gap, and hence prioritises (threatened and evolutionarily distinct) species currently being overlooked.

Feasibility of Conservation Actions

To ensure the EDGE of Existence Coral Reef project has a positive and significant conservation impact, feasibility of implementing conservation actions and the likelihood of success are key secondary criteria. For example, factors such as accessibility, availability of potential collaborators or in-country partners, funding, and stability of country where *in-situ* projects would be located should be carefully considered.

Importance to the Reef Ecosystem

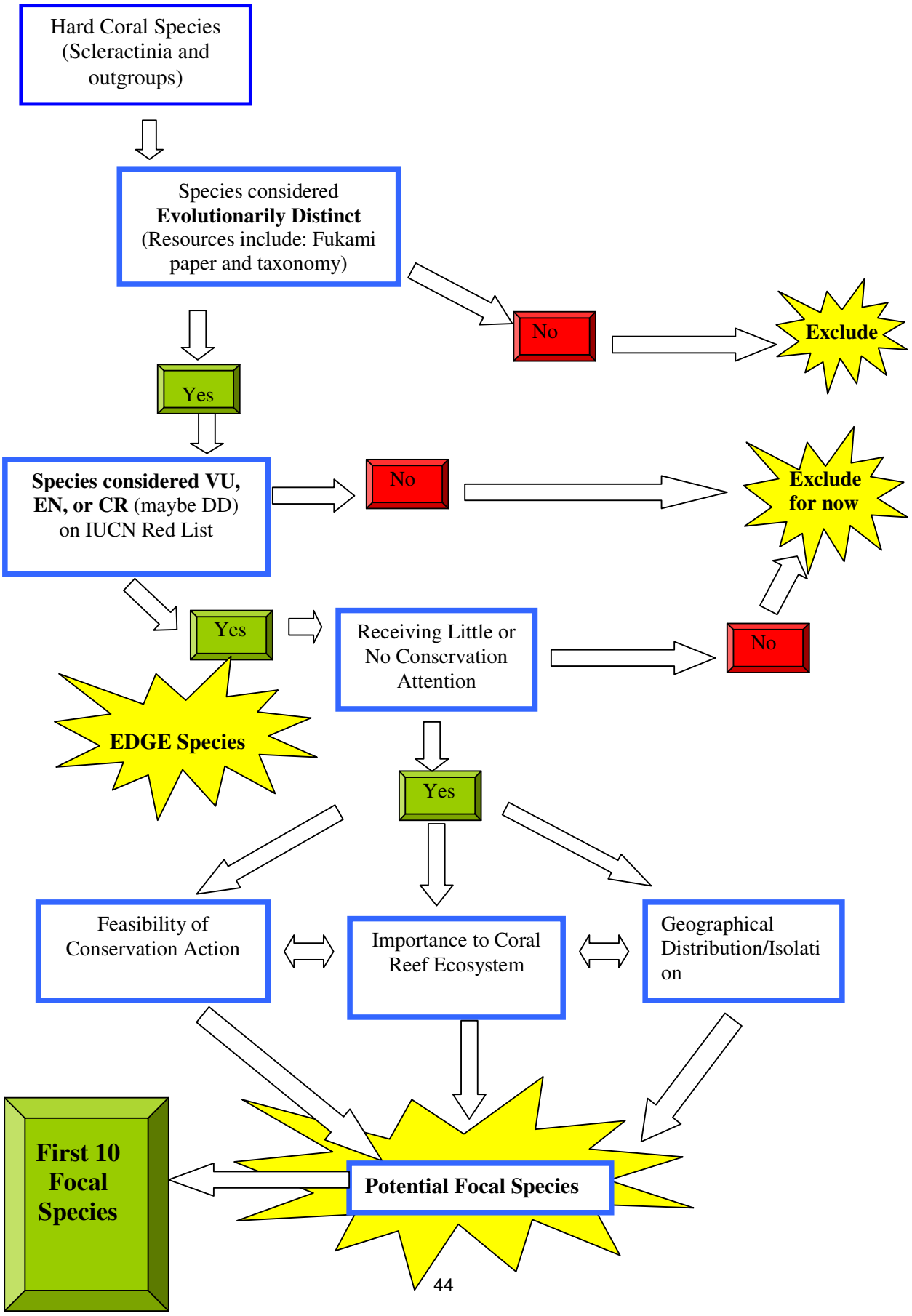
The factors listed below should be considered where information is available:

- Diversity associated with the species or diversity associated with the reefs found within the species' geographical range
- The number of symbionts per host and the specificity of the symbionts to the host
- The extent to which the species is considered ecologically specialised
- Importance of the species to the structural integrity of the reef.

Geographic Isolation/ Endemism

Caution should be taken in considering endemism as limited ranges may depend on taxonomic distinctiveness and insufficient sampling.

Appendix V: Summary of Selection Process



Appendix VI: Professor J.E.N Veron's Evaluation Table of Candidate Species (taken from Professor Veron's new Coral geographic & Coral ID Guides which are currently in development to aid the working groups' decision making process)

Species		#/141 ecoregions	Abundance summary	Preferred habitat
Dichocoenia	*stokesii*	11	Sometimes common	High diversity reef
Heliofungia	*actiniformis*	50	Sometimes common	Soft substrate
Horastrea	*indica*	6	Uncommon to rare	High diversity reef
Parasimplastrea	*sheppardi*	4	Rare to very rare	High diversity reef
Physogyra	*lichtensteini*	78	Usually common	High diversity reef
Ctenella	*chagius*	2	Usually uncommon	Reef slopes
Acropora	*palmata*	9	Common	Shallow reef
Moseleya	*latistellata*	17	Usually uncommon	Soft substrate
Oculina	*varicosa*	9	Rare/azooxanthellate	Non-reef/high lat.
Acanthastrea	*hillae*	71	Common in high latitudes	High diversity reef
Blastomussa	*merleti*	63	Always uncommon	High diversity reef
Blastomussa	*wellsi*	52	Usually uncommon	High diversity reef
Coeloseris	*mayeri*	57	Uncommon	Reef slopes
Eusmilia	*fastigata (sic)*	9	Usually uncommon	High diversity reef
Micromussa	*amakusensis*	55	Rare except N Japan	Non-reef/high lat.
Montastraea	*cavernosa*	14	Common	High diversity reef
Oulastrea	*crispata*	44	Uncommon	Non-reef/high lat.
Physogyra	*lichtensteini*	78	Sometimes common	Non-reef
Plesiastrea	*versipora*	110	Sometimes common	All
Stephanocoenia	*intersepta (sic)*	11	Sometimes common	High diversity reef
Diploastrea	*heliopora*	74	Common	High diversity reef
Manicina	*areolata*	9	Usually uncommon	High diversity reef
Pseudosiderastrea	*tayami*	78	Uncommon	Non-reef
Schizocolina (sic)	*africana*	2	Uncommon/unknown	Non-reef
Schizoculina (sic)	*fissipara*	2	Uncommon/unknown	Non-reef
Stylaraea	*punctata*	15	Usually rare	Non-reef
Trachyphyllia	*geoffroyi*	57	Usually uncommon	Soft substrate
Simplastrea	*vesicularis*	2	Very rare	High diversity reef
Mussismilia	*braziliensis*	1	Common	Non-reef

Appendix VII: Workshop Agenda

Thursday 4th March

Session 1: Identify Focal Species

10 am	**Introduction to EDGE** Presentation by Dr Jonathan Baillie, Director of ZSL's Conservation Programmes
10.45 am	**Workshop Aims & Introduction**
11 am	**Questions and Discussion:** Highlight shortlisted candidate EDGE species & Secondary Criteria. Opportunity for addition of other candidate species.
12 pm	**Lunch**
1 pm	**Focused Discussion in two working groups:** Evaluate shortlist using secondary criteria
3 pm	**Break**
3.45 pm	**Focused Discussion in two working groups:** Evaluate shortlist using secondary criteria
4.30 pm	**Present Working Group Evaluations**
6 pm	**Break for the day**

Friday 5th March

Session 1 Continued: Identifying Focal Species

9 am	**General Discussion: Finalise Ten Focal Species** Discuss working group species evaluations & finalise 10 focal species
10.45 am	**Break**
11 am	**Final Agreement on Ten Focal Species**
12 pm	**Lunch**

Session 2: Recommended Conservation Actions

1 pm	**Presentation on EDGE Fellowship Programme**
1.15 pm	**General Discussion: Recommended Conservation Actions** Development of feasible actions plans & collaborations
2.45 pm	**Break**
3 pm	**General Discussion: Recommended Conservation Actions**
4.30 pm	**Workshop End**