

I. Introduction

It has been almost a decade since the first Singapore Green Plan (1993) was formulated. Since that landmark event, many changes with respect to our environment have taken place, some for the better and some for the worse. It is most heartening to see that our government has once again embarked on a review of the current Green Plan looking at the turn of the new century for the next ten years. It is indeed laudable that the Draft Plan takes as its approach a holistic and long-term view of the environment with an attempt to underpin our economic activities with the principle of sustainable development. The recent announcement to designate Sungei Buloh and the Labrador Park as nature reserves (on par with the Bukit Timah and the Central Catchment Nature Reserve) is a giant step forward in the direction of making the Plan a reality. Sharing the Draft Plan's call for people or public participation, the Nature Society (NSS) is providing this feedback in the hope that The Singapore Green Plan 2012 can be the foundation for nurturing Singapore into a model environmental city of the tropics. As the Society's expertise lies mainly in the field of nature conservation, the focus of our feedback will be on green issues. However, aspects of brown issues will be taken into account and dealt with where they have a bearing on nature conservation.

II. Definition and Principles

A) Sustainable Development

1. We find the definition of "sustainable development" as "the balancing of development with the environment" (ENV., pt. 1.1.2) too vague to be of any use in the formulation of environmental management policies and plans. A definition that can be translated into a quantifiable framework should have been adopted such as the Ecological Footprint approach (Wackernagel & Rees, 1996).

2. Thus we are sceptical of the Draft Plan's claim that "Singapore can be justifiably proud that it has successfully achieved economic and social

growth without compromising the environment”(ENV., pt. 1.1). By what measure is this balance supposedly achieved? Have all costs of economic development (including externalities) been factored into the measure of this so-called “balance”?

B) A Balanced & Holistic Approach

1. The Draft Plan has not realistically addressed the most fundamental issue concerning the future of Singapore in terms of what is recommended by the Plan as a “holistic approach” to our environmental problems (ENV., pt. 2.0.2). Could we still hope to achieve a “balance” between socio-economic progress and the environment if we do not keep tabs on population growth which is supposed to rise to five and half million in about 40-50 years time? Could such a “balance” be still maintained if we were to have this five-and-half million people while at the same time pushing for unlimited economic growth with its concomitant rising consumerism?

2. What has been dubbed a “balance”, (“a thriving world-class city with a quality living environment”, ENV., pt. 1.3.2), may supposedly be achieved but our Ecological Footprint may very well cover half the globe. This will be far from a holistic result in terms of global sustainable development. Yet “doing our part for the global environment because environmental degradation knows no boundary” is regarded by the Draft Plan as one of “three key thrusts in the formulation of SGP 2012” (ENV., pt. 1.3.1).

3. It is not denied that Singapore has done well (so far) in maintaining a good and healthy living environment in terms of ambient air quality, high public health standards, etc. (ENV., pt. 1.1.4; brackets ours). But our perception is that this has not been balanced with an equitable care and protection of our natural heritage and capital. For example, apart from the curtailment or destruction of many terrestrial nature areas over the past decades (e.g. Senoko), there is as yet no attempt being made to institute legal protection for marine life despite Singapore being signatory to the UN Biodiversity Convention in 1992. We certainly hope that the recent cancellation of the landfill project at Chek Jawa (Pulau Ubin) will be a step towards remedying this unhealthy situation by gazetting it as a marine reserve.

4. As can be discerned in the groundswell among the people for Chek Jawa and other nature areas, Singaporeans do not only want “to continue to enjoy clean air, clean water and clean land in the future” but also unviolated nature areas as well. (Refer to SEC Land Use Attitude Survey, 2001). But this has not been sufficiently emphasized in the Draft Plan.

III. Monitoring and Sectorial Involvement

A) Review Time Frame

1. We certainly agree with the Draft Plan that a long-term view of environmental sustainability is needed (hence we have to look 10 years ahead) and also that a collective effort and active participation by the various sectors of the population is critical to the success of a green plan (ENV., pt. 1.3.1).

2. However, the Draft Plan fails to introduce a time frame for review of the action programmes for the implementation of the Plan. If we were to review these efforts only after 10 years, any errors and failures occurring in the intervening years before the review could already have led to irreversible damage to our environment. A long-term plan does not entail a long-term review. We propose that a five-year review be instituted for monitoring the Plan’s objectives so that mistakes can be remedied and detrimental trends reversed before it is too late.

B) Ecological Health Indicators

1. A fundamental aspect of monitoring is the use of environmental indicators as yardstick to determine acceptable or healthy levels of change in the environment. This has not been properly addressed or implemented in the Plan as far as nature conservation is concerned. Here, we propose that a monitoring system be urgently worked out by forming a monitoring panel consisting of academic and non-academic experts.

C) Co-ordinating Committee

1. In conjunction with the above, there is a need to form an independent co-ordinating committee to oversee the implementation of the action programmes for the nature areas. This committee should comprise of representatives from the various stakeholders --- relevant government bodies, non-governmental organisations, academic institutions, businesses, etc. It should be chaired by a public figure who is not a government official and acceptable to the stakeholders involved.

D) The Three Ps

1. The categorization of the various sectors of the population into the three Ps --- the Public, the Private and the People (ENV., pt. 1.3.3) --- is not neat and can cause confusion with a lack of proper definition. The term “public” can also be construed as the “people”, while the “private” can also be “people” working on an individual basis. To prevent confusion, we suggest that these terms be converted as follows: “State/Government” for “Public”, “Business” for “Private” and “Community” for “People”.

2. It must be said that with respect to the current Plan, the attempt to raise the awareness and active participation of the people is not well carried out. For example, a critical part of the Plan --- the Revised Plan for Conservation --- has been completed, yet to date we do not see any attempt to exhibit the results and proposals of the Nature Conservation Review Committee (NCRC). No public forums have been mounted specific to this aspect of the Plan to generate discussion and obtain feedback from the community. This unhappy situation should be quickly remedied.

IV. Clean Air, Water and Land

A) Clean Air

1. We certainly applaud the Draft Plan’s intention to be more dependent on cleaner energy sources in the future, but the idea of deriving energy using

hydropower from a foreign source (ENV., pt. 2.1.10) has to be carefully considered, as the creation of hydropower via the development of dams is notorious for its negative impact on the natural environment. In maintaining our clean air and energy needs, we should not be contributing to the further destruction of the remaining tropical rainforests in the region or we would have failed to “play our part for the global environment”.

B) Clean Water

1. We are extremely concerned about the plan to use “67% of the land surface” for water catchment (ENV., pt. 2.2.13). This amounts to an increase of 17 % from the current use. We understand that our future water needs cannot be sustained by existing reservoirs and arrangements made with foreign sources of water supply. However, this hefty increase of the water catchment on the land surface will inevitably entail that more land area will have to be put under water as reservoirs, for as the catchment is increased more storage space has to be created. This will most probably mean that more nature areas such as low-lying marshes and woods have to be sacrificed.

2. A case in point is the creation of the Outward Bound School Reservoir in Pulau Ubin, where some woodland in the area were flooded together with the loss of a majestic Pulai tree. The Draft Plan in the Annex has suggested the “possibility of constructing a reservoir in P. Ubin”, in addition to the one already constructed at the Outward Bound School. We strongly urged that this possibility be avoided in Ubin as well as in other areas on the mainland where nature areas are going to be destroyed. In the case of Ubin, the several existing large quarry lakes should be explored as alternatives for reservoirs. As is emphasized by the Draft Plan, every effort should be made in “relieving the pressure to open up virgin land conserved as nature areas” (ENV., pt. 2.2.10).

3. As is well-known, Singapore is a profligate consumer of water and more effort should be made to control this unhappy state of affairs. In this regard, we concur with the Draft Plan’s advocacy for the “use of incentives and disincentives” (ENV., pt. 2.2.16) as well as use of “seawater desalination and water reclamation using membrane technology” (ENV., pt. 2.2.12). These measures are highly costly. However, to attain ecological sustainability, we have no choice --- consumption has to reflect costs to the

environment and this means higher prices, which will in turn promote a frugal use of water.

4. We are sceptical of the claim of the Draft Plan that “inland water outside the water catchments supports aquatic life and forms part of a good and aesthetic living environment” (ENV., pt. 2.2.1). Is this claim correct? If correct, to what extent are the inland waters outside the water catchment supportive of aquatic life? Is the survival of highly pollution resistant species indicative of this? Outside the water catchment, it is a grim fact that the fish life that can be seen commonly are the Guppy (*Poecillia reticulata*), the Mosquito Fish (*Gambusia holbrookii*) and the Common Tilapia (*Oreochromis mossambicus*), both exotics and highly pollution-resistant species. The rampant filling up of freshwater ponds and the concrete canalization of drains and rivers all over Singapore as well as uncontrolled siltation going on in these places have taken a heavy toll on our local fishlife such as the Croaking Gouramy (*Trichopsis vittata*).

5. We hereby strongly urge that an action programme be implemented to save our remaining freshwater aquatic life (in ponds, drains and rivers) outside the water catchment. Immediate measures to be implemented as soon as possible should be:

- i) To halt further filling up of ponds and marshy areas;
- ii) To stop the concrete canalization of our drains and rivers and where feasible to re-instate the natural flow and condition of our drains and rivers, especially in the countryside (e.g. around the Kranji Reservoir, where even if there is flooding it will hardly inconvenienced anyone as there are no housing estates around);
- iii) and last but not least, to monitor and implement heavy penalties for soil erosion at construction sites.

Only then can we be truly proud of our inland waters as waters which are not only conducive to aquatic life but which are aesthetically appealing as well.

C) Clean Land

1. Illegal dumping have decreased with the help of stringent regulations and enforcement (ENV., pt. 2.3.1) but more needs to be done in terms of vigilance as evidence of illegal dumping still crop up in remote, disused roads and lanes.

V. Nature Conservation: General Matters

A) Proposals of the Review Committee

1. We are most disappointed that the chapter pertaining to nature conservation is extremely brief with a seeming lack of attention to very important biodiversity issues pertaining to the subject. We are also most concerned that the Draft did not contain any of the proposals made by the Nature Conservation Review Committee (NCRC) for the Singapore Green Plan (1999). Have these proposals been considered by the Draft Plan committee? Have they been all rejected?

2. The fact that there are no public forums instituted for the review of the Green Plan leaves this matter in a state of mystifying limbo in the minds of concerned NGOs and members of the public. A great deal of time and effort was expended by NGO representatives of the Review Committee. It would indeed be a crying shame if their deliberations and proposals were to be completely disregarded. We hereby strongly urge that this situation be rectified before the Final Plan is formulated.

B) The Nature Society's Proposals

The Nature Society's recommendations for nature conservation that have been submitted to the Review Committee are appended here for consideration (see Appendix 1 for summary; for full descriptions of sites, please refer the Nature Society or the NCRC). We have proposed that 8 % of Singapore's total land area be designated as nature areas, up by 3 % from the 1993 Green Plan.

2. The World Conservation Union (also known as IUCN) has recommended that nature areas should make up a minimum of 10 % of a nation's total land area. The percentage increase advocated by the Nature Society is in lieu of the fact that our reclamation projects is in the process of increasing our total land area by at least another 100 sq km. And also because new ecologically important nature areas have been identified.

3. We also strongly urge that The Green Plan 2012 also designate as "nature areas" the four marine sites demarcated in the 1993 Green Plan, with the addition of Chek Jawa, another marine site of high ecological importance.

VI. Nature Conservation: Terrestrial Matters

A) Action Programmes for Nature Areas

1. In the first Singapore Green Plan (1993), nineteen (19) terrestrial sites were identified and designated as "nature areas", amounting to 5 % of Singapore's total land area (see Appendix 2 for general site locations). However, it must be said that in terms of action programmes required to ensure their long-term viability and survival, very little progress was made, apart from the very recent gazetting of Sungei Buloh and the Labrador Nature Park as "nature reserves". More could and should have been done to ensure the protection of the other nature areas as well.

2. Right now, an important nature area, the Kranji Marshes, is in imminent danger of having a large part of its core area destroyed by the SAFRA golf course project, while another important marshland at Sungei Berih in the Western Catchment nature area has been largely developed by MINDEF. The Pulau Tekong, Mandai and Kranji Estuary Mangrove (all nature areas in the 1993 SGP) are also being threatened by URA's announced reclamation plans (refer to Appendix 3).

3. This is contrary to the significantly growing concern and support among Singaporeans for our remaining nature areas to be left as they are and protected. We strongly urge that the relevant authorities take heed of the four proposals for upholding the Green Plan put forward by the Friends of the

Singapore Green Plan (1998). A total of 28 organisations from a wide variety of sectors in Singapore --- social, cultural, business, environmental – have endorsed these proposals. The document, dated 30th August 1998, containing these proposals together with the signatory endorsement of the organisations was submitted through the Singapore Environment Council (SEC) to our Prime Minister, (refer to Appendix 4).

4. These four proposals are :

- i) “That the size and boundaries of all the ‘nature areas’ identified in The Singapore Green Plan (both terrestrial and marine) be clearly and officially defined and demarcated”.
- ii) “That **all** these ‘nature areas’ already identified in The Singapore Green Plan (both terrestrial and marine) be safeguarded in our current as well as future development plans”.
- iii) “That all the ‘nature areas’ identified in The Singapore Green Plan (both terrestrial and marine) be given legal protection status as have the two existing ‘nature reserves”.
- iv) “That mandatory environmental impact assessment be implemented for any development projects on the periphery or boundary of any of these ‘nature areas’ ”.

5. Thus, in the spirit of the four proposals put forward by the Friends of the Green Plan, we hereby propose that the following action programmes (steps) be taken towards ensuring their long-term viability and survival :

Step 1: Biodiversity Survey

A comprehensive biodiversity survey should be carried out within and on the periphery or adjacent land parcels of the identified nature areas. Development or land-use plans on the periphery or adjacent to the nature areas should be put on hold to enable a proper ecological survey to be carried out. Until this step is completed, the size and boundary of the nature areas cannot be ecologically determined and should not be officially finalized. However, tentative boundaries based on existing knowledge of its

biodiversity should be in place as immediate measures to safeguard against any destructive uses and accidents.

Step 2: Delineation of Size & Boundary

Based on the biodiversity survey, the size and boundary of the nature areas could then be determined and demarcated on official maps (i.e. maps produced by the Land Survey Department). Buffer zones and their allowable uses should also be determined. The ecological determination of the area sizes and boundaries as well as their buffers are critical to the success of the implementation effort, as it will enable us to determine whether the nature areas have been degraded or curtailed in terms of their spatial extent through the years ahead.

Step 3: Management

With the area size and boundary determined, the next step would be to carry out management for the nature areas. Territorial usage, jurisdiction and responsibility will become clearer for management purposes. Once the management system for a particular area has been established, it should be officially publicized through the various mass media or through roving exhibitions. This will prevent any abuse from members of the public. The intensity of management will depend on the ecological conditions and importance of the area. Legal protection could be instituted under the Nature Park scheme as in the Sungei Buloh Nature Park. Some of the more important nature areas such as Pulau Tekong, Pulau Ubin and the Mandai Mangrove and Mudflat could eventually be recommended for Nature Reserve status if the biodiversity remains viable after a period of time.

Step 4: Monitoring

Once the ecological boundary has been established and a management system set up, a meaningful monitoring programme of all the nature areas could and should be instituted. The first comprehensive survey would provide the baseline data for this monitoring programme, which preferably should be executed at a short-term interval (such as on an annual or bi-annual basis). Biodiversity indicators should be identified and measures appropriately taken --- so that we can reliably estimate the health and

viability of the nature areas as the years go by. Without these indicators and their measures, it would be extremely difficult to establish the state of our biodiversity. As such, it is critical that all the steps above be carried out as soon as possible.

Step 5: Mandatory EIA

EIAs should be made mandatory for all development projects that are planned for areas that are adjacent to the nature areas. Only eco-friendly projects should be allowed. The transparent implementation of EIA hinges critically on the existence of clearcut boundaries for the nature areas, otherwise the extent of degrading or destructive impacts cannot be ascertained properly. We strongly urge that no development plans should be decided for a designated nature area until an EIA has been implemented and the results put on public exhibition to obtain feedback. The implementation of EIA at a stage when a core area of the Kranji Marshes (one of the nineteen nature areas in the 1993 Green Plan) has already been allocated for the SAFRA golf course project is certainly a step backward for the Green Plan.

6. A start has to be made now to implement these action programmes or more nature areas will be endangered or lost. The Draft Plan boldly claims that “Singapore is committed to keeping the nature areas for as long as is practically possible and avoid further fragmentation of the nature areas to prevent the destruction of biodiversity” (ENV., pt. 2.4.5). How can such a grand design be delivered if practical steps such as these are not taken soonest possible.

B) Other Terrestrial Matters

1. We applaud the creation of the Garden City or City-in-the-Garden, but this could and must be in harmony with the other equally important objective of protection and promotion of biodiversity. In this regard, the emphasis should be on retaining existing greenery in public parks and housing estates instead of landscaping from scratch and planting exotic vegetation.

2. A garden city or a city-within-a-garden looks positively dull if it consists of regimented patterns of vegetation on an artificially flat and uniform landscape. Scenic variety, psychological, therapeutic and aesthetic values can be nurtured in our city and suburbs by retaining the remaining remnants of hills, valleys, belukar, coconut/rubber plantations, orchards, ponds and uncanalised rivers. Although such features are no longer as common as in the past, retaining as much as possible will help to break the monotony of our city and suburban landscape, at the same time helping to save wildlife by using these as stepping stones and habitat corridors.

VII. Nature Conservation: Marine Matters

A) The Four Marine Zones

1. The formulation of the Draft Plan on nature conservation is still predominantly land-biased --- in this respect not much progress has been made from the 1993 Green Plan on the marine conservation front. There were four marine conservation zones in the first Green Plan --- a) St John Site; b) Pulau Hantu Site; c) Pulau Semakau Site; and d) Pulau Sudong Site, (refer to Appendix 5). However nothing has been done after this and it seems like just a symbolic exercise.

2. In the Draft Plan, there was no mention of these four marine conservation zones. Is marine conservation not integral to the nature conservation chapter of The Green Plan? Or has the decision been made to exclude these important zones of marine biodiversity from any protection and management measures?

B) The Blue Plan

1. We hereby strongly urge that these zones be designated as marine nature areas and a Blue Plan formulated as an integral part of the SGP 2012. The Blue Plan should include a legal and regulatory framework with an identified central or coordinating government agency. Here we propose that the Blue Plan submitted by the Blue Plan Group (BGP) of the Feedback Unit (MCDS) be adopted.

2. At present there is no singular or coordinating government agency that looks after marine habitats --- with different zones under different authorities, some of the islands being under the Sentosa Development Corporation (SDC), surface water under Maritime and Port Authority (MPA) and underwater seabed under the Land Office. Marine habitats beside the body of seawater should include mangrove, coral reefs, rocky coast and sandy mudflats.

C) Marine Pollution

1. There is no doubt that the government has achieved good environmental management concerning air, water, land and noise. The thrust on the use of cleaner energy, recycling of resources and waste, the improvement of waste management and pollution control is highly commendable. It is laudable that a “framework will be formulated and regulations enacted to control land pollution” (ENV., pt. 2.3.12), but surely this will be lop-sided if it does not also apply to marine pollution as well. We are disappointed that control and elimination of marine pollution has not been adequately addressed as these are definitely critical in protecting marine biodiversity.

2. Serious oil spills have occurred in our seas. It is not denied that efficient containment and mopping-up measures have been promptly carried out to minimize impacts. Mention is made in the Draft Plan that “comprehensive measures are in place to prevent and combat oil spills” (ENV.’ pt. 2.4.4). What are these measures? More information should be provided here comparable in detail to those already given for land pollution.

3. Whatever these measures may be, they have been ineffective against the coating of the spills on mangrove roots, blackening them up to high-tide level and causing detrimental ecological impacts (such as the tainting of the feathers of mangrove bird species), as can be seen at Pulau Semakau, Pulau Senang and Pulau Pawai. There is an urgent need in the future to apply whatever containment and mitigation measures against oil spills not only around recreational islands but also around islands and shores that have been designated as nature areas in the Green Plan (e.g. Semakau).

D) Dire Situation of Marine Habitats

1. Only 1 % of the original mangrove remains today but 27 species out of about 50-60 entire world species of mangrove trees are recorded in Singapore. There are over 2000 species of plants and animals associated with mangroves in Singapore.
2. An estimated 60% of Singapore's coral reefs have been lost through reclamation. There are no fringing reef existing on the main island. Only clusters of reefs remain relatively intact among the southern islands, among which the most accessible is the patch reefs off Pulau Hantu, used extensively by divers in Singapore.
3. The coral reefs in Singapore still maintain a high diversity in their upper zones. Approximately 150 species of hard corals are present on Singapore reefs compared to 200 species in Malaysia and 300 species in the Philippines and Indonesia.
4. The offshore waters have become turbid with heavy sedimentation load from the reclamation and dredging activities, threatening the remaining coral reef communities. Similar measures taken against siltation during the construction of Pulau Semakau landfill should also be taken for the reclamation activities at Jurong Islands. Silt screens should be put up. And when dredging sea channels, silt should not be thrown to both sides of the lane but should be carried away by sand barges.
5. Intertidal sandy mudflats/seagrass beds are fast disappearing. The reprieve for Chek Jawa (Pulau Ubin) has saved an extensive patch for the time being but the other equally extensive patch at Pulau Tekong is in imminent danger of being wiped out by reclamation.
6. The Labrador beach is the only remaining natural rocky beach left in mainland Singapore.
7. There are no marine parks or marine reserves gazetted in Singapore so far. The recent proposal by the Singapore Underwater Federation for Pulau Hantu as Singapore's Marine Community Park has been rejected. We strongly urge that this proposal be reconsidered. Water sports especially scuba diving and angling continues to be popular in Singapore, but these activities require not only clean water but also intact marine habitats.

VIII. Community Partnership

1. We concur with the Draft Plan that "government action itself will be inadequate" to carry out effectively the action programmes and that "active participation by the people sector " is critical to their success (ENV., pt. 3.0). However, it must be said here that not enough has been done to promote nature awareness in the past. In the Draft Plan section on educating the general public, there is no mention of any programmes that can be initiated to promote nature awareness. Apart from carrying out programmes to promote awareness of brown issues, the Singapore Environment Council (SEC) should also put in equal or greater effort to tackle green issues and to promote nature awareness.

2. Mention is made in the Draft Plan of 'Environmental Studies' being introduced in tertiary institutions but do these programmes include nature conservation, natural history studies and environmental ethics? To take a fundamental step forward, we strongly urge that nature studies be introduced into the school curriculum as part of the effort to raise "the environmental awareness of children and young adults" (ENV., Box 3.1b), as the young are more responsive to acquiring a new outlook and habits.

3. It is heartening to know that MINDEF has been promoting "the education process for young males" in national service and that its "Environment Committee implements projects on resource and nature conservation"(ENV., Box 3.1b). Here it must be said that this aspect of MINDEF's activities is not publicised and remains to date unknown to the rest of the nation. It indeed would be most inspiring for the whole nation to know of MINDEF's patriotic achievements on the biodiversity front by opening up its nature conservation areas for public benefit (of course on a limited access basis).

IX. Concluding Remarks

We are prepared to provide expertise and assistance in the following fields to ensure the success of the Green Plan:

1. Survey and monitoring of the biodiversity of the nature areas.
2. Planning and design of the nature areas.
3. Management of any nature areas.
4. Ranger patrol for the nature areas.
5. Educational guidance for visitors of the nature areas.

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THE NATURE SOCIETY (SINGAPORE)

CONSERVATION COMMITTEE

FEEDBACK ON THE SINGAPORE GREEN PLAN 2012

Containing the Society's Comments and Recommendations on the Draft Copy of the Singapore Green Plan 2012 issued by the Ministry of the Environment in November 2001.

January 2002

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Contents

I. Introduction	1
II. Definition and Principles	1
B) Sustainable Development	1
C) A Balanced & Holistic Approach	2
III. Monitoring and Sectorial Involvement	3
A) Review Time Frame	3
B) Ecological Health Indicators	3
C) Co-ordinating Committee	4
D) The Three Ps	4
IV. Clean Air, Water and Land	4
A) Clean Air	4
B) Clean Water	5
C) Clean land	7
V. Nature Conservation: General Matters	7
A) Proposals of the Review Committee	7

B) The Nature Society’s Proposals -----	7
VI. Nature Conservation: Terrestrial Matters -----	8
A) Action Programmes for Nature Areas -----	8
Step 1: Biodiversity Survey -----	9
Step 2: Delineation of Size & Boundary -----	10
Step 3: Management -----	11
Step 4: Monitoring -----	10
Step 5: Mandatory EIA -----	11
B) Other Terrestrial Matters -----	11
VII. Nature Conservation: Marine Matters -----	12
A) The Four Marine Zones -----	12
B) The Blue Plan -----	12
C) Marine Pollution -----	13
D) Dire Situation of Marine Habitats -----	13
VIII. Community Partnership -----	15
IX. Concluding Remarks -----	15
References -----	15

Appendix 1: Singapore Green Plan --- Proposed Revision (Conservation)

Appendix 2: Nature Areas in the Singapore Green Plan (1993)

Appendix 3: URA's Announcements on Land Reclamation

Appendix 4: Friends of the Singapore Green Plan

Appendix 5: Identified Marine Coral Areas (SGP 1993)

(There are no appendices attached to this soft copy. For access to these appendices, please refer to the hard and bound copy of this report available at NSS office).