Environmental Audit Report on International RAMSAR Wetlands

Report Number: PER/B/2019/03

National Audit Office

Environmental Audit Division

1. Executive summary

Wetlands are unique and biodiversity ecosystems that form the background of human civilization in the world. Due to the uniqueness of ecosystems the international RAMSAR Wetland Convention was established in 1971 as an instrument for the protection and management of wetlands universally. As of 2018 there were 2,331 RAMSAR wetlands identified worldwide and Sri Lanka has claimed 06 Zones.

With the growth of population and urbanization, limited use of land was increased and also, it was observed that threats to the sustainability of wetlands have been increased. Those ecological important areas are facing a serious challenge due to human activities and lack of adequate attention by the institutions, which have the authorities concerned the wetlands are in danger of being destroyed. The purpose of this audit was to examine whether their duties have been accomplished by relevant institutions and to discuss regarding the related issues. Reclamation of marshlands, removal of forest cover, excessive availability of wetland resources and the rapid spread of invasive species and the biomass species are some of the problems. Bundala, Wilpattu, Kumana, Anavilundava, Vankalei, and Madu Ganga have been designated as national parks and sanctuaries of international importance as the main RAMSAR Wetlands in Sri Lanka. Although Sri Lanka is included as a member country under the International RAMSAR Wetlands Convention, no separate legal systems has been established in Sri Lanka for the implementation of the convention. It was observed that the RAMSAR Wetlands are regulated under the provisions of the Ordinance of Fauna and Flora protection. Since the declaration of the RAMSAR Wetlands, there has been insufficient research on the sustainability of biodiversity in these wetlands. It was also observed that, although the number of strategic and national plans have been prepared for the conservation of biodiversity, no specific plan has been prepared and implemented for performance evaluation and the effectiveness regarding the zones of RAMSAR Wetlands.

Although the boundaries relating to areas identified as RAMSAR Wetlands have been published in the Gazette at the date of audit, attention has not been adequately addressed to mark the boundaries and the streamlining of the ownership of some lands pertaining to the RAMSAR Wetlands. It was observed several illegal activities which are not environmental friendly, such as unauthorized building construction inside the RAMSAR wetland and reclamation of land in the inductive zone and also observed that, a

great obstacle for the biodiversity in the conservative areas and system of lakes due to the spread of invasive species. It has been observed that the staffing and the basic facilities are not adequately provided for the conservation of RAMSAR Wetlands. And also, it was observed that a great attention should be paid for conserving of these wetlands which are of universally importance. Furthermore it is observed that further intervention of the government should be required to conserve these wetlands which are of higher value of biodiversity, historically and archaeologically important and provide many ecological services such as flood controlling, an area of water source which is a paradise for many endangered species of fauna and flora and many migratory birds species.

2. Background and nature of the report

2.1. Background of the wetland zone

Natural and man-made wetlands which have been a center of its cultural economic and social evolution and had been fertile for more than thousand years are rich in biodiversity hydrologically sensitive ecosystems. Wetlands can be simply referred as lands which are bedraggled throughout the year or for a particular period of time in the year. Approximately 15% of the total land area of Sri Lanka consists of natural and artificial interior wetlands

2.1.1. The themes of the International wetlands Day celebrations

With the declaration of world Wetlands day on the 2nd February since 1997, Sri Lanka has partnered to celebrate the day as a part of it.

Following are the themes of International wetlands day during the past few years.

2010	-	wetlands biodiversity and climate change
2011	-	Wetlands and forests
2012	-	Wetlands and tourism
2013	-	Wetlands and water management
2014	-	Wetlands and agriculture
2015	-	Wetlands our future
2016	-	Wetlands our future sustainable livelihood
2017	-	Wetlands for disaster risk reduction
2018	-	Wetlands for a sustainable urban future
2019	-	Wetlands and Climate Change

(sources: Internet)

2.1.2. The theme and function of International Wetlands Day -2019

(a) Theme

Wetlands and climate change is the theme of International Wetlands Day of 2019. International wetlands Day is celebrated every year under specific theme. Nowadays, the effect of Climate change is almost universal. Many countries are vulnerable to this climate change in a variety of ways and have to spend huge sums of money to give away the solutions for the social, economic and environmental problems and disasters due to these climate changes. This celebration of international Wetlands Day have been conducted in the year 2019 with the aim of familiarizing the special value of wetlands among people and to emphasis their ability to use this with lunch to control the bad effects of the climate changes.

(b) Functions

Studies show that the number of natural disasters worldwide has doubled in the last 35 years. About 90% of these wetlands are water related disasters. It is also predicted to have higher likelihood of unsafe weather. Following are some of the ways, which wetlands contribute to control greenhouse gas emission and to minimize the impact of natural disasters.

i. The effect of climate change on wetlands

There is a possibility of destroying the wetlands or impede their operation or changing the situation due to severe droughts and heavy flooding as the effects of climate changes. This could lead to loss of biodiversity in wetlands, changes in natural processes, disruption of wetland's livelihoods and disruption of tourism.

ii. Wetlands absorb and deposit carbon

Peat lands, mangrove ecosystems in grasslands fix a large amount of carbon. About 3% of the total land area of the world is peat lands and approximately 30% of the produced carbon is fixed by these peat lands.

iii. Wetlands of coastal zone are a shield of defense.

Mangroves, salt marshes, coral reefs and sea grasslands in the coastal zone act as shock absorbers. These ecosystems slow down the speed of the waves of the sea. It also slows down the speed of wind and waves during Hurricanes and Tsunamis. It minimizes the risk of damage to the coast, land, life and physical structures.

iv. Minimizing water shortage in dry season and flood controlling.

Wetland such as mashes, reservoirs, rivers and streams, have the ability to be withstand heavy rainfall, there by controlling the immediate flooding due to heavy rainfall within a short period of time. And also the wetlands helps to prevent water scarcity during the dry season by releasing the water retained in the wetlands in the wet season.

2.1.3. Types of wetlands in Sri Lanka and in its specialties

Wetlands in Sri Lanka can be categorized as follows, depending on the way they are created and salinity of the water.

Table No – 01

	Type of wetlands	**Specialties**
(a)	**Natural freshwater wetlands**	
	Rivers and streams	There are 103 rivers including small streams of water throughout the year and only one part of the year.
	Freshwater Marshlands	The only freshwater marshland in the country is the Walawatta wathurana marsh forest. Two rare plant species called “Horawel” and “Suwanda” are found.
	Villus overflow plains	The water accumulated in the low lying areas of associated with the overflowing plains after a overflowing of a river, is likely to remain unoccupied for some time in the year. These areas are called villus. There are many

		villus associated with the Mahaweli river. Type of Wetland with higher biodiversity.
	Overflowing plains	During the rainy season, associated low plains are fallen under water due to the overflowing of rivers and streams. The plains which are fallen under that overflowing water are called overflowing plains.
(b)	**Natural saline-water and natural brackish-water**	
	Rivers estuaries, delta and lagoons	Very important wetland ecosystems for fishing industry. They are very important as feeding grounds for aquatic bird species.
	Lagoons of saline-water and brackish-water.	An ecosystem with small plants adopted to the marine saline environment, shrubs and plants belong to mangroves. Organism belong to species of crustacea (crabs) are common.
	Mangroves	A unique ecosystem growing associated with the lagoons and river estuaries. Consisting with species with unique adaptations (ex:- Breathing roots, Split roots, Areal roots, Viviparous, Radial roots) Very important for the food chains and food nets of saline-water and brackish-water, fishing industry and protecting land from marine erosion. Mangroves have been spread over 16,000 hectares around the country.
	Corel reefs	Rich in higher biodiversity. Important for Tourism and protecting the land from marine erosion.

	Muddy flats	Very important lands, providing food for aquatic birds.
	Sea grasslands	Very important ecosystem for endangered species such as Dugong, for fishing industry, Food chains and food nets of saline-water and brackish-water.
(c)	**Artificial Wetlands**	
	Inland fresh water tanks.	Tanks are man-made reservoirs.
	Aquaculture ponds	Economically important ecosystems.
	Salterns	Economically important ecosystem which provides food for aquatic birds.
	Paddy fields	An ecosystem that provides rice, the staple food. Approximately 12% the total land area of them is used for paddy cultivation.

(Sources : Internet)

2.1.4. Advantages of wetlands

Wetlands providing many benefits for human beings

Table No – 02

Description	Benefits
Water	For necessities such as drinking, bathing, sanitary and sports activities.
Food	Rice, vegetables (Kekatiya, Lotus bulbs, Kerankoku) fruits (Kirala) leafy vegetables (Kankung, Neeramulliya) and resource of fish.
Medicine	Keekirindiya, screwpine. Monerakudumbiya, Olu, lotus, seeds and pollen of Manel.
Materials for industry	For weaving mats (reeds, screwpine) building materials (limestone, wood) Fuel, peat and firewood.
Entertainment	For entertainment and education (bird watching, boat riding and swimming)
Industry	Agriculture, paddy cultivation, fishing industry (aquatic farming) domestic industry (hand craft production such as mats and masks)

(Sources : Internet)

2.1.5. Benefits of Wetlands to the environment

i. Breeding of aquatic organism

ii. Controlling flooding

iii. Protecting ground water

iv. Providing food, fish and breeding centers for aquatic life and related ecosystems.

v. Land protection in the event of natural disasters such as Tsunami.

vi. Preventing coastal erosion.

2.1.6. Threats to wetlands in Sri Lanka

(a) Filling of Marshy lands

Wetlands are being reclaimed for various development needs and industrial purposes to accommodate the growing population. Wetlands are rapidly destroyed due to illegal reclamation.

(b) Disposal of waste

Wetlands are considered as infertile lands and there are circumstances such as dumping industrial waste, garbage, various poisonous toxic chemicals and waste from the pulling down of the buildings, into the wetlands. This will pollute ecosystem of the wetland and damages its biodiversity. At the same time research has revealed that 10% - 25% of chemical fertilizer applied to farmland is released to waterways.

(c) Removal of forest cover in wetlands

Illegal removal of forest cover around wetlands will change the functioning of the ecosystem. There is room to spread the invasive plant species in the open ground. Similarly, the species adapted to the farm former environment may become extinct.

(d) Blockage or changing of natural waterways

The wetlands can be destroyed due to the loss of adequate water. Due to blockage of natural water sources in to the wetlands and changes in the quality of the collected water in the wetlands.

(e) Reclamation of wetlands by soil erosion and deposition of sediment

Soil erosion caused by irregular land using patterns can result in deposition of sediment mixed with water reservoirs, reducing the water level of reservoirs and causing it to dry up quickly even during a short drought.

(f) Excessive acquisition of resources in wetlands

Excessive removal of biomass and other natural resources from wetlands to the detrimental capacity of the system will result in the destruction of the wetland and the extinction of the ecosystems. Excessive removal of sand, clay, ornamental fish or ornamental plants can damage the ecosystem.

(g) Spread of invasive species of plants and organisms

Non-native species are invasive alien species/ animal that are spread over one or more habitats due to their rapid growth and reproduction, rapid adaptation to ecosystems and the ability to spread in local areas.

Identifying these plants / animals is very important as an effective and environmental friendly management strategy.

Japan Jabara (***Eichhornia crassipes***), Hambupan (***Typha angustifolia***), Kalapu Andara (***Prosopis juliflora***), Katu Pathok (***Opuntia dillenii***), Wel Aththa (***Annona glabra***), Diya para (***Dillenia suffruticosa***), Pathanpalu (***Austroeupatorium inulifolium***) can be mentioned as some of the species listed in the plant manual published by the Ministry of Mahaweli Development and Environment in the year 2015. Invasive plants floating into the wetlands can cause adverse conditions such as blocking the flow of water and blocking sunlight from entering the reservoirs. It also slows down the natural process of wetlands. Wetlands are also vulnerable to dryness due to the effects of plants such as Wel Aththa and Kalapuandara. It was observed that the role of responsible stakeholders in the management of these invasive plants in the RAMSAR wetland should be enhanced. According to the Diagnostic Guidelines Manual for invasive alien species published in 2015, methods suppressing each plant were identified, but no control methods were introduced to control the plants such as Hambupan and Diyapara.

And also there are invasive species of organism also can be encountered in the wetlands. Among them, the main are, Tanki Cleaner (***Pterygoplichthys spp.***) Redear tortoise (***Trachemys scripta)*** Apple snail (***Pomacea spp.***).

These organisms pose a threat to the extinction of native species in wetlands. And also fisheries based on wetlands adversely affected by these species.

2.1.7. Sri Lanka Laws to protect wetlands

i. National Wetland Policy
ii. National environmental Policy
iii. Fauna and Flora Protection Ordinance
iv. Coastal Conservation Act
v. Forest Conservation Ordinance
vi. National Environment Act
vii. Fisheries and Aquatic Resources Act

2.1.8. RAMSAR Convention

"The RAMSAR convention" is the international convention on wetlands slides habitat on the 2nd February 1971 in RAMSAR city of, Iran, with the objective of protecting the wetlands due to the adverse impact of wetlands. This convention addresses wetland and aquatic birds living in wetlands. At present 170 member States have rectified the convention on the 22nd June 1990, Sri Lanka was also a member of the convention which became effective in Sri Lanka on the 15th of October 1990.

According to the RAMSAR convention, wetlands are areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six meters known as wetlands (section 1.1 of the International RAMSAR convention) which acts the department of wildlife is the main government institution acts on the conservation of wetlands in Sri Lanka .

(a) The primary objectives of the convention

There are three primary objectives in the convention of RAMSAR of wetlands.

i. Wise use of wetlands
ii. Conservation
iii. Management and Transboundary Corporation

(b) The mission of the RAMSAR convention

The mission of the convention is to conserve the wetlands through international Corporation with regional and national activities and to achieve sustainable development by using them wisely.

(c) Duties of the RAMSAR convention

i. Directing the government to use wetlands wisely.
ii. Declaration of International Important wetlands as RAMSAR wetlands and contribute to the conservation of them.
iii. Maintaining corporation among country wide wetlands.

(d) Criteria for recognition as an International wetland in accordance with Convention

The criteria for the identification are set out in part v section 64 of the RAMSAR wetlands identification manual No-17 prepared by RAMSAR convention secretariat on the matters discussed at the $7^{th,}$ $8^{th,}$ 9^{th} and 10^{th} meetings of the parties of the RAMSAR convention.

Under the RAMSAR convention, wetland is declared an international important wetland under 02 groups. They are group A and B. Nine criteria are used for this purpose. Criteria No.01 is categorized under group A and criteria number ii to ix are categorized under group B.

Group A

i. **<u>Sites containing representative, rare or unique wetland types</u>**

A wetlands should be considered internationally important if it contains a representative, rare, or unique example of a natural or near – natural wetland type found within the appropriate biogeographic region.

- **<u>Sites of international importance for conserving biological diversity</u>**
- **<u>Criteria based on species and ecological communities</u>**

ii. A wetland should be considered internationally important if it supports vulnerable, endangered, or critically endangered species or threatened ecological communities.

iii. A wetland should be considered internationally important if it supports populations of plant and/ or animal species important for maintaining the biological diversity of a particular biogeographic region.

iv. A wetland should be considered internationally important if it supports plant and/or animal species at a critical stage in their life cycle, or provides refuge during adverse conditions.

- **Specific criteria based on waterbirds**

v. A wetland should be considered internationally important if it regularly support 20,000 or more water birds.

vi. A wetland should be considered internationally important if it regularly support 1% of the individuals in a population of one species or subspecies of water bird.

- **Specific criteria based on fish**

vii. A wetland should be considered internationally important if it supports a significant proportion of indigenous fish subspecies, species or families, life – history stages, species interactions and/or populations that are representative of wetland benefits and/or values and thereby contributes to global biological diversity.

viii. A wetland should be considered internationally important if it is an important source of food for fishes, spawning ground, nursery and/or migration path on which fish stocks, either within the wetland or elsewhere, depend.

- **Specific criteria based on other taxa**

ix. A wetland should be considered internationally important if it regularly supports 1% of the individuals in a population of one species or subspecies of wetland – dependent non-avian animal species.

(e) RAMSAR regions of the world

Wetlands in the world belong to six major regions

i. Asian region
ii. African region
iii. European region
iv. North American region
v. Caribbean region
vi. Latin American region and the Oceanian region (including small islands)

2.1.9. RAMSAR wetlands in Sri Lanka

(a) Wetland zones

Following are the six wetland zones and their basic details

Table No -03

	Bundala National park	**Anawilundava sanctuary**	**Madu Ganga sanctuary**	**Vankalei sanctuary**	**Kumana National park**	**Wilpaththu National park.**
The date declared as a wetland	12th June 1990	03rd August 2001	11th December 2003	12th July 2010	29th October2010	02nd February2013
RAMSAR wetlands' number	487	1078	1372	1910	1931	2095
Location	Hambanthota	Puttalam	Galle	Mannar	Ampara	Puttalam/ Anuradhapura
Quantity (ha)	6210	1397	915	4839.95	19011	165800
RAMSAR criteria	Hasn't presented	1,2,3,4,7,8	1,2,3,4,5,7, 8	1,2,3,4,5,6,8	1,2,3,4,6,8	1,2,4,8
Authority of management	Department of Wild Life conservation					

(b) The peculiar significance of the RAMSAR wetlands of Sri Lanka

i. Bundala National park

The wetlands consisting of 04, shallow brackish-water lagoons called Bundala, Embilikala, Malala, Koholankala is of international importance because it is lodging for migrating birds who are migrating to warm countries, leaving their own countries during the winter season. It has been reported, that more than 15,000 migratory sea birds are enjoying this wetland during the migratory season. A total of 197 species of birds have been recorded here. It has been revealed that the stone tools belong to stone-age have been stored in the RAMSAR wetlands and the earliest prehistoric human settlement in Sri Lanka the under 125,000-year-old Homo-sapiens' first inhabited after shifting to Asia.

ii. Anavilundawa sanctuary

The Anavilundawa wild life sanctuary is designated as second RAMSAR wetland in Sri Lanka, has been decided as of international importance as it has following characteristics.

- Establishment of the ancient Ellanga lake system dating back to the 12th century.
- Providing home for threatened vertebrates (amphibians, reptiles, birds and mammals) and several endangered species.
- About 35% to 40% of the species of vertebrates who are found in Sri Lanka are living here
- Reports of several species of birds migrating to the country through Western migratory routes.
- Nearly half of the freshwater fish species of Sri Lanka (including endemic species) have been recorded in these wetlands.
- To act as a productive site for plantation of flora and fauna which are needed for fish species and as a sanctuary for migratory fish species.

iii. Madu Ganga sanctuary

Madu Ganga RAMSAR wetland is located near the southern Balapitiya sea in Sri Lanka. Madu Ganga is also known as a lagoon and only natural mangrove forest in Sri Lanka. It was revealed that Madu Ganga which consists of 64 islands is currently confined to 26 islands. There is also an ancient temple on one of the islands. The Madu Ganga is a home to a large number of organisms and is very rich in biodiversity. Approximately 30% of local flora and fauna and 45% of foreign species are recorded. There are 110 species of birds, 24 mammal species, 70 fish species, 30 reptile species, 50 butterfly species and 300 plant species and a rare mangrove species among the present mangrove species in Sri Lanka, called Rathamilla can be found only in this region of Balapitiya Madu Ganga RAMSAR wetland. Madu Ganga is important for controlling the flooding of the area during the monsoon season. Madu Ganga is a place which has won the tourist attraction highly and the place where the only palm tree, Ging coconut which is grown associated with mangroves, the productions related to cinnamon cultivation and traditional fisheries are the activities associated with the Madu Ganga.

iv. Vankalei Sanctuary

The sea boundary of the sanctuary is bounded by the islands of Vankalei, Pulliyanthiw and Thiruketheeswaram. It is made up of a vast ecosystem with shrub forests, tanks, sand dunes, mangrove forests, salt marshes, lagoons and sea grasslands. There are 149 species of birds have been reported there and a variety of bird species can be watched in this sanctuary. There are more than 60 species of fish, turtles and other rare animal species. one part of the wetland is equipped by the animal husbandry and fisheries for trade. Vankalei sanctuary has been an important archaeological site since it was a major port in ancient Sri Lanka.

v. Kumana National Park

Kumana National Park belongs to Yala East of Ampara district is known as the 5th RAMSAR wetland in Sri Lanka. It is a birds paradise where you can see 50% of these species of birds in Sri Lanka, and 35% of the migratory aquatic birds. A Wetland with lively habitat lagoons, estuaries, mangroves and salt marshes of coastal zone. This wetland is rich in biodiversity, rich in food, shelter protection and breeding grounds for animals. This wetland is threatened by illegal hunting, tree cutting and other destructive activities and the spread of invasive species such as Salvenia (***Salvinia molesta***) and the free floating ferns.

vi. Wilpattu National Park

Group of wetlands in Wilpattu has been declared as the 2095th RAMSAR wetland of the world, on the 2nd February 2013, the world wetlands day. These wetlands are unique due to following reasons.

- A unique wetland consisting with coastal natural wetlands, territorial wetlands, natural terrestrial vegetation and temporal man- made irrigation system.
- This is the only place with villu wetlands which has been formed as resolution of the land and the bio aqua zone of monsoon forest of Sri Lanka.
- There are 23 bio species from the international trade convention of the endangered fauna and flora and 12 bio species listed in the convention of conserving the migrant birds species have been recorded in this wetland.
- Serving as a breeding ground for 21 endemic vertebrates species of Sri Lanka.
- The Kala Oya and Modaragama Aru estuary are the places in this wetland which are economically important because this is a protective area for immature stages of crustashia. (prawns)

- Serving as a feeding and lodging place for over 30 migratory waterfowl species along the South Asian migration roots and also it is home to more than 40 higher number resident aquatic bird species.
- The sea grasslands in this wetland is contributing by protecting the endangered species of the world such as Sea pig (***Dugong dugon***) and one species of sea horse.

vii. Wetland City

Most of the wetlands in Sri Lanka are situated in urban areas and due to the rapid urbanization, the forest veil has been gradually removed.

The Wildlife Conservation department has taken measures to name Colombo city as Sri Lanka first RAMSAR wetland under the RAMSAR convention. The wetland which represents about 120 square kilometers and 16 square kilometers from the city of Colombo is facing threats due to various reasons. It was revealed that 40% of the cities wetlands have been lost over the last four decades and 1.2 % of the wetland is being losing annually.

2.2. Authority for Audit

The audit was carried out under my direction in pursuance of provision in Article 154 (1) of the Constitution of the Democratic Socialist Republic of Sri Lanka in conjunction with provisions of the National Audit Act No. 19 of 2018.

2.3. Audit Objectives

To evaluate whether the relevant institutions have fulfilled their duties and discussed about present situation of the ecologically important RAMSAR wetlands which face serious challenges by human activities and due to lack of adequate attention by the authorities concern about the risk of this wetlands being destroyed.

2.4. Basis of choosing the topic

The existence of wetlands is threatened by the lack of international involvement in regional local national and rural initiatives and the involvement of relevant government agencies for the protection promotion and global sustainability of RAMSAR wetlands.

2.5. Related Institutes and their roles

Table No-04

Institution and the particular Act	The provisions regarding the wetlands
(a) Wild Life Conservation department • Fauna and Flora Conservation Act (Authority-469) amended by the Act No.44 of 1964, Act No. 01 of 1970 and Act No. 01 of 1993.	• Section 2(1), (2), (3) of National reservoirs and sanctuaries • 3(1) required elements of National parks and sanctuaries. • 3(a) Prohibited to construct tourist resorts within a one mile from a National reservoir. • Section 6(1), 6(2), 6(3) – No person could be admitted any animal by tethering, freeing and entering domestic animals and letting them stray through an entrance of National park or National reservoir. • Section 7 - Activities regulated in the sanctuary. • 9(a), (b) The conditions and limitations should be prescribed for hunting, shooting, killing and seizing the wild animals within a sanctuary. • Section 9 (a) (1) 2 - restricting the development activities within 01 mile of National reservoirs.
(b) Central Environmental Authority • The National Environmental Act No.47 of 1980, amended by the Act No.56 of 1998 and Act No.53 of 2000.	• Statement 15,(a) (b) of the Section IV under environmental management- Land usage Management • Section 16 - Methods of Land usage. • Section 17 – Management and conservation of natural resources.

	• Section 18 – Fisheries and Aquatic Resources Management Policy • Section 19 - Procedure for the intelligent use of fishing resources. • Section 20 – Forest Resources Management Policy. • Section 21 – Forest science Management Policy. • Part IV (b) of - 23 (g) –limiting, Controlling and regulating the pollution of local water bodies and Polluting of the local water bodies.
(c) Department of Fisheries and Aquatic Resources • Fisheries and Aquatic Resources act N0. 02 of 1996.	• Part V -conservation • Section 36 – Declaration of Fisheries reserve areas. • Sections 37 (a), (b) – Prohibited activities in fisheries reserves. • Section 38 - Lease of state lands • Part VI - Aquaculture • Section 39 – Licensing for aquaculture entrepreneurs.
(d) Department of coast conservation • Coast Conservation Act No.57 of 1981	• Part II – Managing the coastal zone. • Section II (I) (e) – A list of all estuaries and wetlands within the coastal zone, with regard to the importance of fish reservoirs or wildlife habitats.

(e) National Aquaculture Development Authority • National Aquaculture Development Authority of Sri Lanka Act No. 53 of 1998.	• Orders of the Minister of Fisheries and Aquatic Resources Development in terms of sub section (c) of section 37 (1). (Gazette Notification No. 1736/21 of 13th December 2011) • Issuing of a permit for an entrepreneur who practices fish farming in cages.

2.6. Audit Criteria

i. RAMSAR convention (annexure 1)

ii. Fauna and Flora Protection Ordinance Act amended by the Act No. 44 of 1964 and Act No. 01 of 1970 and No. 49 of 1993. (authority 469) (Annexure-02)

iii. Natural Environmental Act No. 47 of 1980 as amended by Act No. 56 of 1988 and No 53 of 2000 (Annexure 03)

iv. Fisheries and Aquatic Resources Act No. 02 of 1996 (Annexure-04)

v. Coast Conservation Act No. 57 of 1981 (Annexure-05)

vi. National Aquaculture Development Authority of Sri Lanka Act No.53 of 1998 (Annexure-06)

2.7. Audit approach

2.7.1. Sources of Evidence

Relevant evidence was obtained from the following sources which were considered to be adequate and to enable a reasonable conclusion.

- Discussion notes
- Files
- Media notes
- Newspaper articles
- Magazines
- Research reports
- Field trips

2.7.2. Physical approach

(a) Physical examination of 06 international wetlands of Sri Lanka, Madu Ganga, Kumana, Vankalei, wilpattu, Bundala and Anawilundawa.

(b) Confirmation of relevant evidence through photographs taken during observation tours.

(c) Obtaining information relating to wetland rules criteria and convention stakeholders meetings, consulting relevant officials of the Department of Wildlife Conservation.

(d) Obtaining information from the Department of Wildlife Conservation and the Central Environmental Authority on holding the International wetlands Day.

(e) Discussing with CEA official and obtaining information on Central Environmental Authority performance reports on RAMSAR wetlands at present.

(f) Obtaining information on Aquaculture cultivation from the Aquaculture Development authority.

2.8. Scope of Audit

2.8.1. Compliance with international auditing standards

My audit is conducted in accordance with the international standards of Supreme Audit Institutions. (ISSAI 5110 – ISSAI 5140)

2.8.2. Scope

i. To be designated as an international RAMSAR wetland, the RAMSAR convention must meet at least one of the 09 criteria. Physical inspection of 06 wetlands designated as international wetlands in Sri Lanka namely Madu Ganga, Kumana, Vankalei, wilpattu, Bundala and Anawilundawa.

ii. Due to lack of adequate research information pertaining RAMSAR wetlands, the audit observations are limited to the material presented.

2.8.3. Identified risks

i. Although included as member country into the RAMSAR convention, no legal system has been established for the implementation of the convention.

ii. Adequate action has not been taken to prevent natural and man-made threats to these wetlands.

iii. Wetlands are threatened with destruction due to climate change.

iv. After the declaration of RAMSAR wetlands, follow-up work on the present status of those wetlands has not been adequately addressed.

v. Since the RAMSAR wetlands themselves do not have a separate legal system it is inadequate to protect these wetlands solely by laws relating to the agencies responsible for the management of the Wetlands.

vi. Lack of knowledgeable services and lack of facilities to research and explore the wetlands.

3. Observations

3.1. Researches on the Conservation of Biodiversity

The Department of wildlife conservation is the focal point of implementing the RAMSAR wetland convention in Sri Lanka as the wetland regulation is governed by the Fauna and Flora Protection Ordinance Act. Accordingly no specific legal Framework has been prepared for the regulation of the RAMSAR wetlands.

3.1.1. Provisions made for research

The conservation and inspection of the wildlife and Flora of Sri Lanka and to prevent getting commercial uses from such wildlife and flora, and making provisions for the related facts is regulated according to the sub section 02(l) of the Fauna and Flora Protection Ordinance Act and declared of national reserves and sanctuaries (Annexure-02). In accordance with clause 03 National Parks and 03 Sanctuaries have been declared as RAMSAR wetlands from time to time under the convention. According to the provisions of the act scientific research may be authorized in the reserve sanctuary with a permit. In accordance with the observations and recommendations obtained from this research the department should focus their attention on the conservation of flora and fauna in the reserve or sanctuaries.

3.1.2. Variety of research

Following are the observations of the sample research conducted by various parties on the biodiversity in the national parks and sanctuaries designated as RAMSAR wetland.

(a) Research on invasive plants

The following observations were identified in a research conducted in the year 2017 on the special assessment, control and management of invasive species in the Bundala RAMSAR wetland

i. According to the research, invasive species known as Kalapu Andara (***Prosopis juliflora***) and Katu Pathok (***Opuntia dillenii***) had been occupied orderly in (8%) of 486 and (9%) of 568 hectares.

ii. The researchers found that these invasive species spread rapidly and therefore could damage the biological system very quickly. Accordingly it

was observed systematically adopted process should be conducted continuously and methodically by the department for controlling the spread of these plants and also trained officers should be employed for the purpose.

(b) Other threats

Following are the threats identified in the RAMSAR wetlands according to the wildlife wetland declaration published by the Central Environmental Authority in 2017 regarding the mangroves and ecological significance of Sri Lanka.

i. Adverse effects of agrochemicals and salt industry and farming- Bundala lagoon along the South East Coast.
ii. Destruction of mangroves, marshes, swamps along the South West coast.
iii. Destruction of mangrove swamps due to road development work along the North West coast.

Although the adverse conditions had been identified in the year 2017, it has further observed that the identified conditions are being continued till the audit date September 2019.

(c) Failure to acheive recommendations

Although it was observed that research into the biodiversity of Kumana villa which is located in the RAMSAR wetland has been carried out, it has further observed that identified threats and recommendations have not been adequately addressed.

(d) Identification program for birds

National bird ringing program has been implemented in the Bundala National Park from the year 2004 to the year 2018 (Annexure-07) The results of the research conducted by the Field Ornithology Group (FOG) of the university of Colombo during the year 2004 to 2018 are as follows.

	Waders	Forest birds
Total Birds rings	2046	781
Recaptured	52	53

Accordingly, it was observed that, there had been a large number of migratory bird species in Bundala National Park, but it was also observed that the amount has become low in quantity.

(e) Research on defecting heavy metals

The results of the research on monitoring the exposure of birds to heavy metals and Arsenic in Bundala National park in the years 2011 to 2013, are as follows. (Annexure-08).

i. 75 feather samples from 12 birds species have been used for the above experiment the main components of heavy metals such as Mercury (Hg) Led(pb) Cadmium(cd) and Arsenic (As) have been considered in.

ii. It has been revealed that the above heavy metals are incorporated in all bird's species. It was observed that the polluted water from the agricultural canal in the national park was a course of such a situation.

iii. The above research which was conducted in 2011 and 2013 also identified potential threats to biodiversity diversity in the RAMSAR wetlands but at the date of audit measures have not been adequately address to minimize these problems.

3.2. National plan, strategic plans for biodiversity conservation

3.2.1. National planning

(a) Short and long term plans

It has been observed that the preparation of short term and long term plans for the conservation of RAMSAR wetland have not been taken action adequately for identify and implement the performance indicators.

(b) Plants included in the Red Data Book

Lemnitzer littorea (Rathamilla) belongs to the family-Competencies, a true mangrove plant grows in an island belonging to the Madu Ganga RAMSAR wetland sanctuary was identified as one of the two most important true mangroves which has been highly endangered in 2012 according to the national Red list but by 16th August 2019, it was observed that the necessary measures for conservation and replanting of the plant has not been adequately applied

Diagram number 1

(c) Management plans

Although the site reports and management plans on need to be report prepared when necessary to identify critical wetlands in terms of biodiversity, the management plans need to minimize the current threats to the RAMSAR wetland have not been made up to the 31st December 2018.

(d) The inadequacy of the legal provisions

Madu Ganga sanctuary is consisted of state and private clients which has been declared as third RAMSAR wetland in Sri Lanka on 11th December 2003.Although it is necessary to consider the provisions of the Fauna and Flora Protection Ordinance Act to prevent environmental damage caused by certain activities on private lands within the sanctuary. It was found that the following provisions were insufficient

a. Although in the event of any activity of construction being carried out in the inductive region of the sanctuary should be conducted according to the National Environmental Act, they had not been complied with the Act.

b. The data and information required to verify the actual ownership of private land in the wetland have not been updated.

c. Following are some samples of observation on the reclamation of marshy lands in the construction of hotel projects in the inductive region of the Madu Ganga RAMSAR wetland.

- The letter regarding timber mill located in the inductive region (Annexure-10) within the 100m zone which is considered as the minimum inductive level from the Madu Ganga sanctuary, according to the National Environmental Act under the extraordinary government Gazette No- 14 54 / 7 dated 17th July 2006.(Annexure-09)
- Report on settlement of land cultivation details dated 27th March 2019
- Reclamation of low lying lands near Thalgasgoda Deport, Batapola Road, Ambalangoda dated 3rd March 2019.
- The building in the island of Appaladuwa bordering the Madu Ganga, which has been constructed overlooking the natural green cover in the vicinity of the Madu Ganga

- No proper action has been taken to dispose of waste water in the hotel project on Temple Road, Heenatiya and the conditional permit issued for its activities by the department of wildlife conservation

Diagram number 2

(e) Conservation of the Madu Ganga

It was observed that there was insufficient attention paid for the conservation of the unique biodiversity of the Madu Ganga, which consists 08 criteria out of the 09 criteria identified for the RAMSAR wetlands.

3.2.2. Central Environmental Authority

(a) Maintaining data systems

One of the objectives of the national wetland policy of strategy (Annexure-11) published by the Central Environmental Authority in 2006, states that one of the objectives is to act as party to the RAMSA convention to meet its national responsibilities. But inadequate database on sustainability of biodiversity in wetlands had not been maintained by the audit date. It was also observed that the Central Environmental Authority has not done enough to prepare and implement the conservation strategies and plans for these wetlands.

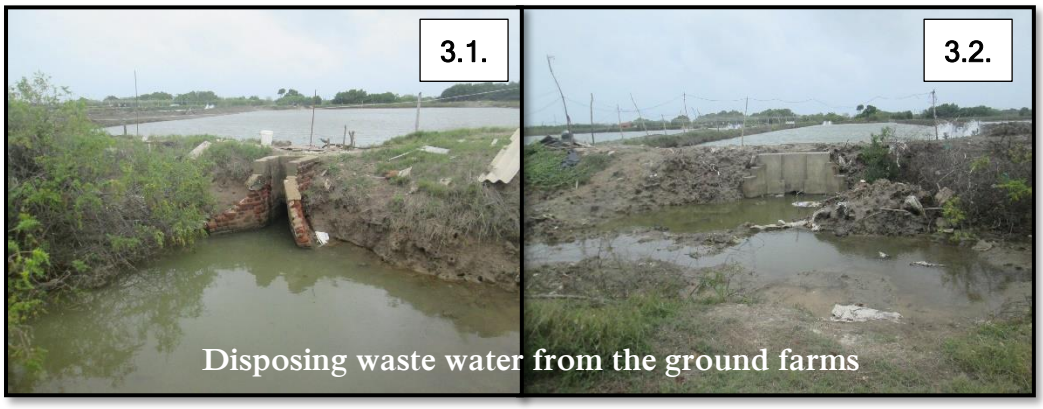
(b) Sensitive wetland management

It was observed that RAMSAR wetlands were not given adequate care for sustainable conservation, although the aim was to establish rural wetland management committees, with the objective of providing the community with proper use of sustainable management of all sensitive wetlands in rural areas.

(c) Prawn farming

It has been observed that the permit for prawn farming has not been confirmed in compliance with the requirements of the National Environmental Act (Annexure-03) (Udappuwa, Anavilundawa)

Diagram No-03



3.2.3. National Aquaculture Development Authority

Giving necessary recommendations

In the event of any activity in the wetlands that may adversely affect the wetland, recommendations should be made .However it was observed, that there is a need to pay attention to the risks to biodiversity by maintaining foot massage centers in cages on ground in issuing recommendations for environmental permits for aquaculture projects in wetland areas.

3.2.4. Plans, Rules and Regulations

(a) To achieve the objectives of the subject contained in the action plan

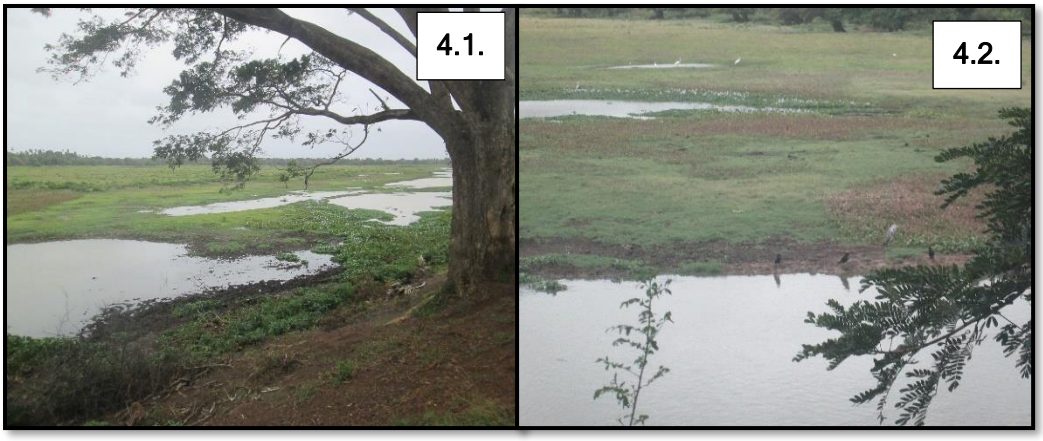
Ecosystems of Sri Lanka work classified on 04 main themes according to the Bio Action Plan (BCAPC) of the 5th National Report to the convention on biological diversity of Sri Lanka (Annexure-12), published by the Ministry of Environment and Renewable Energy in 2014. They are forests, wetlands, marine systems and agro systems. It had been published 16 recommendations and the 03 specific objectives of the action plan identified under the wetlands of this plan. As of the date of audit it was observed that the implementation of the recommendations was inadequate.

(b) Conservation of water sources

The review of legislation related to the conservation of wetlands and associated water sources and identified observations on the protection of water sources were as follows.

i. Rainwater, Deduru Oya and Sengal Oya are the main sources of water for these tanks located in the Anawilundawa RAMSAR sanctuary in the Arachchikattuwa divisional secretariat division of the Puttalam district which is a biodiversity ecosystem consisting of ancient Ellanga tanks which have been in existence since the 12th century. At the time of the audit, it was observed that the water level of the tank had been decreased. The need to develop a system to maintain the water level of the ancient Ellanga tank system in collaboration with the Department of Irrigation was found to contribute to water conservation.

Diagram No-04



ii. Implementation of aquaculture programs for the maximum utilization of aquatic resources is important and the section ll(d) of the Aquaculture Development Authority Act(Annexure-06).Although such programs should be conducted in an environmental friendly manner, it has been observed that the monitoring of fish foot massage centers in the cages operating in the Madu Ganga RAMSAR wetland is not sufficient.

Diagram No-05

iii. A license should be obtained to establish an aquaculture enterprise in terms of part vi of section 39. (Annexure-04) of the Fisheries and Aquatic Resources Act No-02 of 1996. Also the regulations made by the Minister of Fisheries and Aquatic Resources Development under the section 37 (1) (d) of the National Aquaculture Development Authority Act No. 53 of 1998 had been published under the gazette number 1736/21 dated 13th December 2011 (Annexure-06) According to this Gazette, a permit issued to an entrepreneur who is engaged in fish farming in cages and the relevant conditions are mentioned in the permit.

The following were the observations.

- Although 18 persons had been licensed for fish farming in the vicinity of the Madu Ganga RAMSAR wetland in Galle district, there are only five entrepreneurs who had been licensed under the project category of fish massage centers. It was observed that 13 other centers have been operating without a proper license
- It was observed that 04 fish collection centers whose license period had expired, were still operating as at the audit date 15th August 2019.

(c) Prawns Farming

On the 27th August 2019, it was observed that the government had issued annual license for 26 prawns farms and 54 ponds in 03 main divisional secretariats in 15.3 hectares of land in the Anawilundawa divisional secretariat. Details of licenses for prawns farms issued up to the 28th August 2019 for Grama Niladhari Divisions of Anawilundawa, Baththulu Oya, Sengal Oya and Suruwila in Arachchikattuwa division secretariat are given below.

Table No-05

Area	Rent out period (Years)	Extent
Anavilundawa	30 01	Acres 55 Acres 102.75 roods 03 Perches 32
Baththulu Oya	01	Acres 68
Sengal Oya	01	Acres 11.25
Suruwila	01	Acres 7.75

A limited number of mangroves are found in associated with prawns basins of the Anawilundawa sanctuary and it has been revealed that there are instances, where these mangoes have been illegally removed.

(d) Conservation of mangrove Lands

The cabinet memorandum No. 42 / 2019 dated 24th April 2019 (Annexure- 13) which has been entitled as "Preservation of existing mangrove lands and rehabilitation of abandoned state owned mangroves used for prawns farming and salterns" and the following facts were focused.

i. Preparation of a program to Increase by 10,000 hectares of mangroves and rehabilitate with the involvement of Mahaweli Development and Environment Ministry, Forest Conservation Department and other stakeholder organizations and the coastal community.
ii. At the Commonwealth Heads of Government Meeting (CHOGM) 2018, Sri Lanka was the leader in conservation of mangroves and rehabilitation among the commonwealth.
iii. Sri Lanka and Indonesia joint resolution for conservation of mangroves at the 04th Environmental Conference at United Nations in February 2019.

The following were revealed

- The above resolution has been approved by the Cabinet Decision No. 19 / 2157 / 104 / 046-1 (Annexure- 14) on the 21st August 2019.
- Consideration of the relevance of state owned mangroves land for other development activities in terms of the recommendation of Cabinet Resolution 3.1 of the above proposal in the special programs to increase the existing mangroves by 10,000 hectares through the recommendation of 3.3 informing the relevant parties had been approved.

Accordingly, it was observed that the programs to conserve the mangroves and to increase the extent of land related to 06 wetlands declared as RAMSAR wetlands should be further continued.

(e) Aichi, Biodiversity Targets Convention

20 sub objectives have been identified under the 05 strategic goals to be achieved by the year 2020 by the Aichi, Biodiversity Targets Convention (Annexure - 15) regarding the biodiversity has been signed in Japan in 2010. Sub Section 09 of strategic goal –B, provides guidance on how to deal with the prevention and control of invasive alien species. The observations were as follows.

i. Although identifying invasive alien species that may adversely affect the biodiversity, prioritizing, controlling and establishing national targets for the places where special attention should be paid and activating according to that, should be done, it was observed that the adequate attention had not been addressed associated with the RAMSAR wetlands.

ii. The following two species have been identified as invasive species in the database of Global Alien Species in the RAMSAR wetlands.

RAMSAR Wetlands	**Invasive plant**
1. Anavilundawa	***Salvinia molesta***
2. Maduganga	***Ludwigia peruviana***

However, it was observed during the physical examination, that most of the plants were invasive. Accordingly, it was observed that the data systems on invasive plants species related to the RAMSAR convention have not been operated up to date.

iii. It has been observed that technical and financial support has not been adequately addressed to control and prevent the spread of invasive alien species in the RAMSAR wetlands.

iv. According to the National Report on the "Thematic Report on Alien and Invasive Species" (Annexure- 16) following details had been presented by Sri Lanka.

- The priority focused by Sri Lanka on alien invasive species in accordance with the article-8h of the convention was impartial.
- Availability of limited resources in Sri Lanka for the above purpose.
- National strategy and action plan prepared based on the problems of invasive alien species have been designed to limited opportunities.
- The risk caused due to these invasive species for biodiversity has been assessed to a limited extent.

Accordingly, it was observed that responsible stakeholders should be involved in the implementation of the strategy and action plan for the management of these invasive species in the RAMSAR wetlands.

3.3. Activities in the RAMSAR wetlands

The following observations were made during the inspection carried out regarding the settlement of the boundaries of the RAMSAR wetlands.

3.3.1. Streamlining the Location and Boundaries

(a) Non streamlining of boundaries

The Kumana RAMSAR national park is bounded by sea on one side and the other side by Kubukkan oya and another side by the land of Kotiyagala. Land area on the other side announcing the boundaries of the National Park, the Kotagala Wildlife Department has declared the National park belongs to the Kumana National park while the Forest Department has declared to the Kebiliththa reserves. As at the date of audit,11th September 2019, the boundaries of Kotiyagala area had not been streamlined.

(b) Accuracy of GPS series

It was observed that the boundaries were not separated by the boundary stones. Although they were used for the audit of the Madu Ganga RAMSAR wetlands map using 04 GPS points. Furthermore it was also observed that further attention should be paid for the accuracy of using the 04 GPS points in presenting the boundaries associated with this Madhu Ganga.

3.3.2. Unauthorized activities

Damaging mangrove plants

A Large area of mangroves is spread associated with the lagoon in the Vankalei sanctuary. When the fishermen in the area cut down the mangroves and put their branches into the sea, then the squid are coming to lay eggs on these branches and finally these fish are being caught, eventually the mangroves have been threatened with destruction.

A case had been filed regarding the cutting down of the amount of about 100 mangrove plants (floral mangroves) which has grown well over a half hectare area in the center of the lagoon in the Vankalei sanctuary by the month of April 2019, in the Mannar magistrates court on the 22nd April 2019, by the range officer of the Wildlife Assistant Director's office.

3.4. Non- environmental and illegal activities

3.4.1. Unauthorized construction and other unauthorized activities

(a) Unauthorized construction

The ***Lemnitzer littorea*** (Rathamilla plant) belonging to the family *Competencies* true mangrove plant on a private island belonging to the Madu Ganga RAMSAR wetland sanctuary was identified as one of the two most threatened mangroves, according to the National Red List of 2012. At the time of audit, it was revealed that only 48 species of Rathamilla were over 50 years old on this island and this species of Rathamilla have been threatened. It was observed that reclamation and construction on the island of 43 families found that the species which adds immense value to biodiversity could be destroyed.

(b) Other unauthorized activities

- It has been revealed that an illegal prawns farming business is being carried out along the Boralessa canal near the RAMSAR wetlands of Madu Ganga.
- It was revealed that unauthorized Hunters are being entering and hunting in the Kotiyagala region of the Kumana National Park, by the date of audit.
- It has been observed that fishermen are engaged in fishing activities within the 24 hours of the day around Bundala RAMSAR wetland, without complying the section 6(a)(1) (Annexure-02) of the Fauna and Flora Conservation Ordinance Act and also it was observed that the people who are engaged in lagoon fishing industry, are engaging fishing in the sanctuary as well.

(c) Environmental impact of the annual feast of Pallekandala Church

The annual feast of the pallekandala the church, located in Wilpattu National Park is held annually in July and had been held for 5 days from 10th to 15th July 2019. The following were revealed.

i. As there are approximately 70 vehicles entering in to the National Park daily from the two entrances, the total number of vehicles entering the Eluwankulama entrance was 1,575 during the five days of the festival with an average of 100 to 670 vehicles per day. There were 12,319 people entering during the same period and the daily entering was between 394 and 7457.

ii. Although the live animals are forbidden to be brought into the national park, devotees who came to the feast had brought animals.

iii. Alcohol consumption had been done in the national park.

iv. The increasing of vehicles and people arriving during this period. Due to this the situation has become unmanageable.

Issues had been a problem for the conservation and management of the park and have had adverse effects on the natural grass lands, the freedom of the animals and the environment of the wetland.

(d) Unauthorized construction of the inductive zone.

Following observations are made

i. If a development work is carried out within the within one mile from the boundary of a National Reserve according to the Fauna and Flora Ordinance, the environmental assessment or environmental monitoring should be carried out in the in accordance with the National Environment Act and obtain prior approval from the Director of wildlife. The approval has not been obtained by the two hotel projects in the Wilpatthu National Park. Case has been filed regarding this hotel projects in the Puttalam Magistrates court.

ii. Unauthorized settlements were found within the inductive region of Pallemunei, near the northern boundary of the Vankalei sanctuary. It has been revealed that no legal action has been taken to this regard. The wildlife officers were in the view that, since there were many issues related to the boundaries of the sanctuary, it was necessary to take immediate action to re-survey the land and obtain the accurate legal right urgently. During the inspection of the area , the boundary stones had been removed and unauthorized location of land had been observed.

iii. On one side of the Pallemunei area has been found, the disposal of garbage by the Municipal Council. It was observed that the unauthorized construction and garbage disposal in this manner are very harmful to the environment and the biodiversity of the sanctuary.

Diagram number 6

(e) Unauthorized construction in Wilpattu National Park

Unauthorized construction of the Pukkulama fishing village located in the national park has threatened its existence On the 27th May 2019, the Wanathawilluwa Divisional Secretary and the staff of the survey department has set aside boundary lines to search the boundaries. Accordingly it was revealed that only the area in which people are occupying in shanties, is belonging to the fishing village areas, as the whole area along the road built using concrete, community hall, 11 houses and church have been built is belong to the national park according to the Gazette announcement of the National Park of Wilpattu.

The audit revealed that as of the 14th October 2019 legal action has been taken against these unauthorized constructions.

The following illegal acts and injustices have been caused due to the residence of Pukkulama fishing village being given the opportunity to build permanent houses in the Wilpattu to National Park and the lack of a legal Framework for the fishermen.

i. Hunting of the wild animals

It has been revealed that wildlife life is being hunted in the area in which two tanks are located and adjoining areas of the Wilpattu National Park around the Pukkulama village. It had been revealed that the "Kiri Ibba" (***Lissemys punctata***) had been killed and laid on the ground of the National Park around the village and the nylon threads had been hung and prepared for the excoriating the iguanas in the trees of the forest by the wildlife staff of Mollikkulam and the Navy personal on the 12th , 13th and 14th July 2019.

ii. Fishing activities

Permanent settlement of the fisherman in the National Park also allowed them to stay during off season when they were unable to engage in fishing. It had been revealed that the farmers had been habituated to kill the wild animals and eat them as they have no income within this period.

3.4.2. Contamination of water

(a) Contamination of water by tourist boat services

According to discussion on the problems of the Madu Ganga, held at the Balapitiya Divisional secretariat on the 15th May 2018. It was identified that there are about 20 tourist boat services in the vicinity of the Madu Ganga and about 200 boats of them. It was calculated that 07 liters of kerosene oil was burnt per day, and 1400 liters of fuel were used in one trip. It was observed that the kerosene which was being burning, has been a potential threat to the waters of the Madu Ganga and to the aquatic life.

The following were the observations.

i. Registration of the boats

Boat service is being operated to provide education and recreational facilities to local and foreign tourists, regarding the biodiversity of the Madu Ganga. Although it has been revealed that there are proximately 200 boats operating on this tour boat, no registration number or license has been issued to confirm that, at the date of audit.

ii. Speed limits

Traditional fishermen were spotted in the vicinity of this river and it was observed that the traditional fishing industry have been affected by the non-recommendation of speed limits for the boats.

iii. Maximum limits of passengers

The maximum number of passengers transported by one boat and the safety procedures for the passengers required by the boat has not been assessed.

iv. Accessing Ferries

It was observed that there were no evaluation on the number of ferries for the boats.

v. **Fuel used in boats**

There has been no regulation of whether the fuel used in boats is environmental friendly and the adverse environmental conditions caused by the discharge of the fuel into the water. It was observed that one set of the boat owners used petrol as fuel and another set used kerosene as fuel. Further it was observed that the fuel is added to the river water while using them for boats.

vi. **Construction of new ferries**

There was no policy, set out to comply with the environmental requirements of building up the fairies for the running of boats.

Diagram number 7

(b) Contamination of water in Bundala lagoon

There has been death of fish only the lagoon of Bundala National Park in the year 2018. It has been revealed that the waste water disposed by the saltern in the Bundala Lagoon was the cause for this.

(c) Contamination due to plastic and polythene

It has been observed that the adverse effects on environment have been increased due to the polythene plastic and other pollutants added to the environment during the foot craft season which passes through Kumana National Park.

3.4.3. Controlling the natural activities

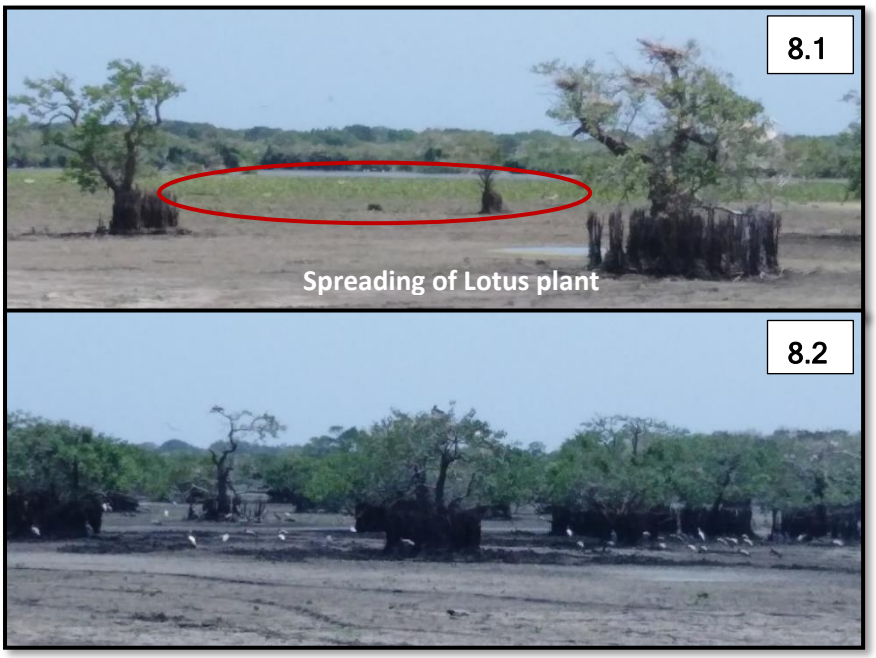
(a) Decreasing the salinity of Kumana vilu

According to the RAMSAR information sheet (Annexure-17) which contains information on the years 2009 and 2012, Kumana wetland has accomplished of the 06th out of 09 main criteria considered, when declaring as a RAMSAR wetland. Under the subdivision 13 and 14 of this RAMSAR information sheet the criteria identified for the wetland and explanations for it have been analyzed The observations regarding this were as follows.

i. Changing nature of the region

In Kumana wetland, Kumana villu was identified as a paradise for birds with higher biodiversity. The salinity of the water source is a significant factor in the growth of the bird populations. The growth of the birds which inhabited by the aquatic environment and the growth of aquatic plants depend on the amount of salinity. By the audit date, 15th September it was observed that the villu has become a source of fresh water because of the abundantly spread lotus plant.

Diagram No.08



ii. Natural Phenomenon

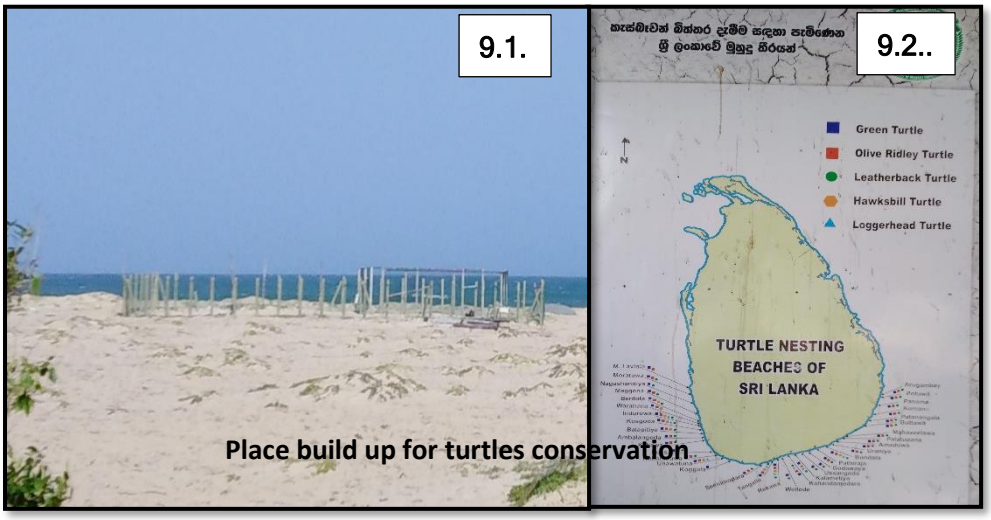
It was observed that the process of mixing villu water and sea water due to a natural phenomenon is being very poor in the present. As of the date of the audit, it is observed that the process of fracturing of natural estuary, is carried out annually in an artificial process. (Bundala\Kumana).

(b) Conservation of aquatic organisms

i. Conservation of the Turtles

Conservation of turtle species of biological and conservation value is done by the Kumana National park. Although it is observed that the coastline of the national park is approximately 23 kilometers, it has been revealed that the turtle species have a capacity of about 06 kilometers for egg conservation. It has been observed that there is insufficient staff available for the conservation of turtles, although there has been eggs belong to turtle species along the coastal boundary.

Diagram No.09



ii. Conservation of sea pigs

The marine zone located in the coastal area of about 38 kilometers in the Western boundary of Wilpattu National Park in the RAMSAR wetlands. Sea pigs (***Dugong dugon***), an endangered species has been found to be in habitat by these marine pastures, since it is a shallow sea grassland. Sea grassland is an ecosystem and must be sustainable to ensure its survival. If the plants grow with larger leaves the biomass can be reduced, the inter material may be damaged and the ecosystem will be collapsed. Therefore, the mutual relationship between sea pigs and the sea grass environment is essential for the survival of the most valuable ecosystems of the world. Sea pigs are suspected to be extinct in Sri Lanka. There have been several reports of Sea pigs being died in different ways. Accordingly, Sea Pigs which are the most endangered species of animals must be conserved. In addition, leather back sea turtles (***Dermochelys cariacea***) are also an extraordinary animal species in the marine zone. But it was revealed that the safety of this marine zone and there was no any program to protect to conserve the resources, pose a serious threat to the survival of these Sea pigs and turtles.

(c) Disaster management

In the years 2017 and 2018, 20 hectares of Pinkattiya, Anawilundawa, Kasanwaththa and Ihala Wewa areas had been caught fire. It was observed that there were insufficient facilities for the disaster management to be carried out in such instances and that fire control was not maintained using a fire belt strategy.

(d) Damage to the plants

It is observed that the amount of 30-40 large Palu trees in Bundala Central Road area has been destroyed. Although the research has been conducted, the causes for the destruction of those trees has not been revealed.

(e) Conservation of Marine Resources

No measures have been taken to conserve and protect the marine zone and marine resources of the RAMSAR wetland of the Vankalei sanctuary.

Diagram number 10

3.4.4. Adequacy of legal matters and legal provisions

(a) Inadequacy of legal provisions

It was observed that the provisions regarding the assessing of the environmental harm caused to the ecosystem because of the development or result of that development program conducted within a private land inside a National park\ Sanctuary which is published as a RAMSAR wetland or due to the waste disposed, waste water and air emission by the particular development program has not been covered by the Fauna and Flora Conservation Ordinance.

(b) Unauthorized hunting of animals

There were 12 cases which have been filed regarding the destruction of animal breeding grounds in the Pinkattiya area of the Anawilundawa sanctuaries and also the cases have been filed regarding the keeping of meat, eggs and the shells of Olive ridely turtle (***Lepidochelys olivacea***), which is a highly protective reptile species in Nakuleliya area.

3.5. Minimizing the growth of invasive plants and its impact

The spread of invasive plants in the RAMSAR wetlands is one of the major problems facing by the wetlands in the present. The absence of migratory birds to the wetlands due to the interference with life processes of fish, lack of food for the wetland birds as a result of adversely affecting biodiversity and adversely affecting the natural process in the wetlands as a result of blocking the flow of water by invasive species floating in to the wetlands and preventing sunlight from entering the reservoir. Similarly impact of invasive plants such as Wellaththa and Kalapuandara can be a threat to dry land, lack of food for animals and loss of natural forest.

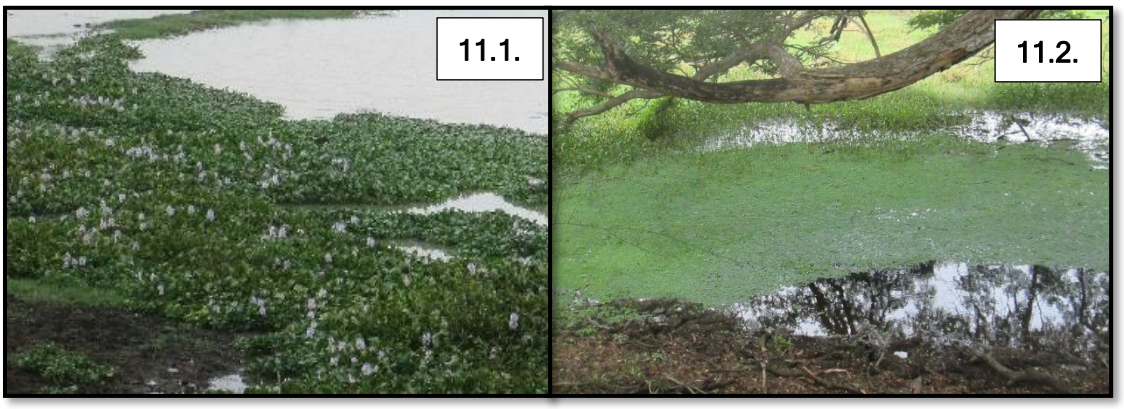
The following were observed.

3.5.1. System of Tanks

(a) Non continuation of preparation and implementation of management plans regarding the spreading of invasive species

It was observed that the designing necessary short term and long term management plans and implementation of them are not conducted continuously to minimize the adverse effects for the sustainability of natural bio-systems due to the increasing of invasive plants such as Japan Jabara, Salvinia, Hydrilla and Diya Gova inside the system of tanks in the Anawilundawa sanctuary.

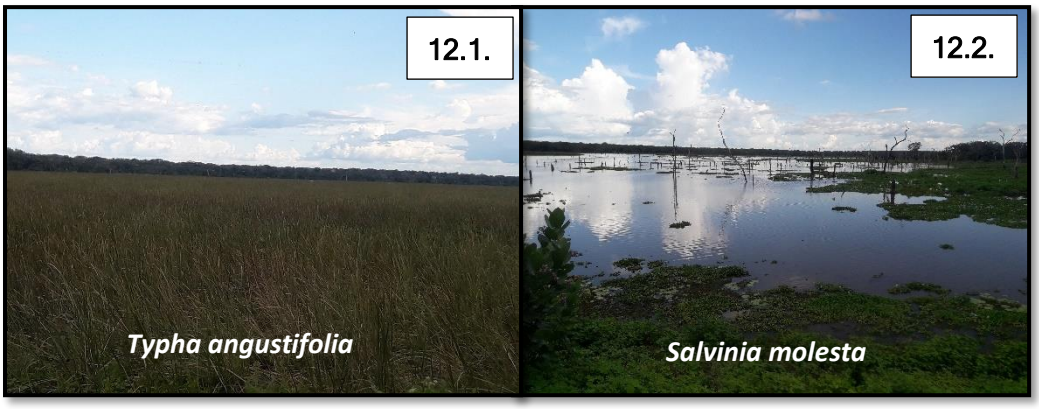
Diagram No.11



(b) Propagation of invasive plants in the system of tanks

Most of the tanks in Wilpattu National Park such as Maha tank, Maradam maduwa tank, Persibedi tank, Andara gollewa tank, Telbeepu tank, hunuwila tank, Kukulukatu tank have been victimized invasive plants and also about three quarters of the Maha tank which is considered as the largest lake among the above had been covered by the invasive plant, Hambupan. It was observed that though the removal of these plants have been started in the year 2019. It is being conducted very slowly and not quantitatively. In addition, these tanks have been threatened by other invasive species such as Japan jabara and Salvinia as well.

Diagram No.12



3.5.2. Impact on lagoons

(a) Rapid propagation of Hambupan plant in Lagoons

It was observed that Malala lagoon has been began to threatened of covering of the plant called Hambupan and also a high percentage of Hambupan plant has been spread on the Embilikala Lagoon in the Bundala RAMSAR wetland. It was observed that adequate attention and program should be implemented for the removal of these plants. At the same time, it was also observed that the contribution for conserving wetland is inadequate in the present.

(b) Minimum intervention of the government

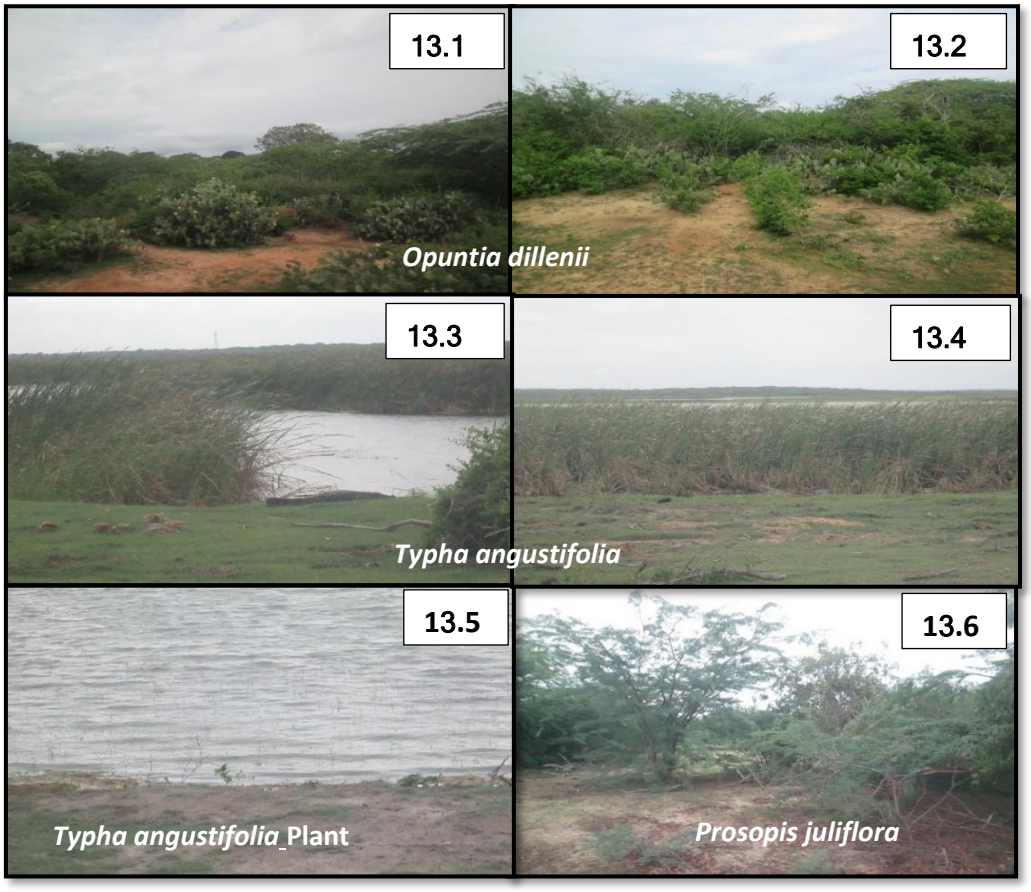
It was observed during the audit that the percentage of salinity of the water in the RAMSAR wetland in the present will be very low. It is observed that the increasing of lotus flower in many places was one factor.

Mixing of lagoon water and sea water had been observed in some places due to artificial reactions instead of mixing lagoon water into the sea as a result of the natural phenomena. The damage caused to the conservation of biodiversity and also minimum intervention of the government for this issue.

(c) Inadequate corporation of public and private institutions

It was revealed that the plant species such Katupathok and Kalapuandara have been spread over roughly around the area of 1000 hectares of the Bundala Lagoon Road area. It was observed that the co-operation of the government and private institutions has been found to be inadequate to prevent the spread of these plants.

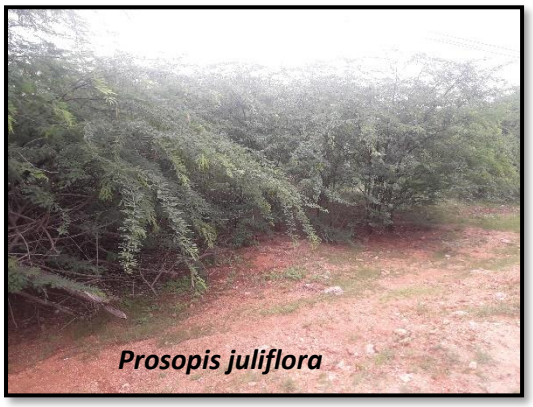
Diagram No.13



(d) Actions has not been taken to control the spread of invasive species

It is observed that many areas of Vankalei sanctuary have been found to be threatened by the trade of invasive plants such as Kalapuandara and Katupathok and by the invasive plant, Salvinia associated with the Itikala lagoon in the Kumana National Park and also action has not been taken to prevent this invasive plant.

Diagram No. 14



(e) Non preparation of a management plan

Management plan has not been prepared regarding the Vankalei sanctuary.

3.6. Monitoring of the conservation activities of RAMSAR wetlands

Department of wildlife conservation is premier agency responsible for the protection and improvement of wetlands in Sri Lanka, which is of international importance and the functions of the range offices of the parks are very important. For that facilitating by promoting the shortage of staff, physical facilities, training for officers is very important.

The following observations were made during the inspection of the RAMSAR wetland range office of the Wildlife conservation Department.

3.6.1. Deployment of the staff

(a) Insufficiency of staff

- It was observed that no separate staff deployed for the activities of the Maduganga conservative area.
- Although, 61 officers were deployed for administrative activities in the Bundala National Park, they had to cover the duties of the places such as park headquarters Udamalala, Weerawila, Wilmanna, Unaniya range office. As of the date of audit, 07 of these officers were on other external duties and 09 were inconvenience in health.
- It was observed that a limited staff 04 officers, employed for the activities of headquarters of Anawillundawa RAMSAR wetland.
- It was revealed that the Wilpattu national park is spread over very large area and therefore the total staff employed is inadequate. There are currently 12 beat and range offices located in the park and it has been confirmed that the number of staff employed is inadequate according to duties assigned to them.
- Madu range Vankalei and Vedithalathivu service stations belongs to the Vankalei sanctuary have been vacaned by 07,09,07 staff officers respectively and only a field assistant officers has been assigned to Vedithalathivu service station. It was observed that actions have not been taken to filed up theses vacancies protect and going concern of this wetlands.

(b) Insufficiency of rang officers and beat officer

It was observed that range officers and beat officer should be established , activated for the proper maintenance of the wilpattu national park. Hence the beat and range offices are not being activating in the regions such as Hemparippuwa, Kaduwawila, Malwathu oya, Elugollewa, Maradanmaduwa and Wallimaduwa while there are 10 site and beat offices are being activating in the National Park. It was proposed to open new beat office at Settikulam and Kapuwathatha.

(c) Non updating of knowledge

It was observed that the staff wok in RAMSAR wetlands have not been provided with updating knowledge on conservation of wetlands.

3.6.2. Basic facilities

(a) In the event of disaster situations for animals in the sanctuaries, it is observed that the facilities for wildlife rescue from the traps and animal treatment (Wildlife health management) were inadequate. (Anawilundawa, Madu Ganga).

(b) It has been observed that, although a large number of local and foreign tourists visit 0n yearly basis, there are not enough facilities for them in the RAMSAR wetlands.

(c) Visitors to the park are allow to descend at 02 places, Kubukvilla and Kudiramale, and it was observed that, in those places there were insufficient facilities for special sightseeing and rest areas and lack of toilet facilities and urinal systems (Wilpattu).

3.6.3. 09 years strategic plan of the year 2016 – 2024, for the management of RAMSAR wetlands (Annexure- 18)

Objectives of the nine years strategic plan

Strategic plan of RAMSAR wetland for the 13th meeting of the stakeholders, held in the United Arab Emirates in 2018 has been introduced 19 aims for three main strategic objectives and 01 operational objective.

Table number 6

Objectives	Aims
1. Distribution of wetlands and its damages.	04 (from 01 to 04)
2. Efficiently conservation of RAMSAR wetland network	02 (from05 to 07)
3. Wise use of all the wetlands	06 (from02 to13)
4. Implementation	05 (from14 to19)

(a) Observations of the Conference Report

Following observations were made by the examination of the situations as at 30th September 2019 in relating to the report submitted to the Conference of the wetlands Management Authority.

Table No - 07

Objective	Aim	RAMSAR convention Reference	Observations for 30th September 2019
01	1.1	1.3.2, 1.3.3	Water resources management and efficient water supply in the RAMSAR wetland have not been interconnected with other national strategies and plans.
01	2.3		RAMSAR wetland strategies and plans for improving the sustainability of its water use in ecosystem needs have not been developed in conjunction with the National Plan.
01	2.4	(Resolution VIII – 1, XII - 12)	It was observed that inadequate attention for the guided decision making processes for the managing and allocating water for maintaining environmental functions of wetlands.
02	5.3	2.4.1	There are 02 draft plans prepared for the effective management of RAMSAR wetlands. Accordingly, the need to prepare a management plan for the other 04 RAMSAR wetlands was also observed.
02	5.4	2.4.2	An action plan has been prepared. Although it has stated that there are 02 RAMSAR wetlands and one of that is still in operation, 02 action plans had been drafted by the date of the audit.
02	5.7	2.4.4	Inter sectorial Management Commitees have been set up only for the Bundala wetlands out of the 06 RAMSAR wetlands. Accordingly it was observed that the requirement for 05 RAMSAR wetlands had not been fulfilled.

02	5.8	(Resolution X 15)	The biological characteristics for only 03 RAMSAR wetland have been prepared. (Madu Ganga, Anawilundawa, Wilpattu)
02	5.9	2.5.1	There had been no evaluation of the effectiveness of the management of RAMSAR wetlands in Sri Lanka.
03	8.1	1.1.1	Although the data on wetlands in Sri Lanka have been prepared the data for the northern and eastern Province have not been updated last decades.
04	16.1	4.1.1	CEPA action plan had not been prepared for the RAMSAR wetlands in Sri Lanka. According to the approach at the 12th conference of stakeholders held in 2015, it was observed that it was the responsibility of the management authority to implement the plan as approved. (CEPA – Communication, Capacity building, Education Participating and awareness)
04	16.2	4.1.2	There were about 04 observation, introducing and educational centers located in the RAMSAR wetlands.

3.6.4. National Biodiversity strategic Action Plan 2016-2022

In terms of section 06 of the Biodiversity Conservation, signed by Sri Lanka in 1992, stakeholders must develop a National Biodiversity Conservation strategic action Plan or similar methodology to integrate biodiversity conservation and sustainable use into sectoral and inter – sectoral activities. According, the Biodiversity conservation Framework had been prepared and recommendations were made in 1998. (Annexure - 19)

12 key goals have been identify by the National Biodiversity Strategic Action Plan for the years 2016 – 2022. Goal 2 of the above action plan outlines the significant reduction of habitat loss, degradation and collapse by 2022, thereby it is evaluate to enable 16 major objectives, the contribution to the following objectives were observe as follows.

(a) Identification of parties

The 5th objective under the Goal 02 is to formulate and implement national strategies to reduce the release of pollutants and solid waste into the wetlands and it had been identify environmental pollution sources fall had to be done by 25% which was prepare and implemented has performance indicators of national strategy (It had been identified that the fall had to be done). But in order to achieve the above objectives, the Department of Wildlife Conservation was identified as a secondary stakeholder, even though it had to be identified as a major stakeholder.

(b) Performance progress

Measurement of the current progress of the indicators set up for performance checking of the target objectives had not been done by the date of the audit.

(c) Identification of protected areas

Goal 03 of the 12 targets set out in the National Strategic Action Plan prepared for 2016 – 2022 is to ensure that by 2022 the reserve network will represent all important ecosystems and species, and control effectively.

Ever, it has been observed that the 10% target for marine protected areas has not been adequately met in terms of AICHI target 11and that no dataset has been maintained on wetlands relevant to the Ramsar Convention.

(d) Turtle Conservation

Goal 4 outlines 10 significant sub – objectives that will significantly reduce the loss of species by 2022. The sixth objective of this program is to regulate the management of turtle eggs and establish a monitoring system in accordance with the guidelines for scientific management. However, it was observed that the Wilpattu, Wankalai and Kumana wetlands did not pay enough attention to meet the above targets.

(e) Invasive plant growth

The sub – objectives 07,08,09,10,11 of goal 2 in the Biodiversity Strategic Action Plan 2016 – 2020, prepared by the Biodiversity secretariat of the Ministry of Mahawelli Development and Environment, identifies the activities that should be undertaken for the purpose of eradication invasive plant species and the indicators for them. It is expected to achieve the AICHI targets and sustainable Development Goal 15 by carrying out the activities required to achieve the above goals and measuring the performance of its performance indicators. However, it was observed that the sufficient attention had not been given on this regard by the date of audit.

4. Recommendations

i. Approving and implementing the legal provisions required for the preservation and sustainability of RAMSAR wetlands.

ii. Conduct research on current status of RAMSAR Wetlands and keep the data system up to date.

iii. Fixing boundary issues in RAMSAR Wetlands.

iv. Preparation and continuous implementation of appropriate methods for the management of invasive species of the flora and fauna.

v. Taking measures to prevent adverse and unauthorized activities in the RAMSAR Wetlands.

vi. Preparation and implementation of a plan for conservation and replanting of other mangroves including Rathmilla mangroves.

vii. Registration of Boat service operating at the Madu Ganga Sanctuary, Preparation and implementation of a regulatory system for regulating the use of fuel for boats, speed limit construction of fish foot massage centers and ports.

viii. Preparation and implementation of RAMSAR Wetlands Management Plan.

ix. Taking action to protect the marine areas of the RAMSAR Wetlands.

x. Taking steps to identify biodiversity Wetlands outsides the declared protected areas and living areas such as sea pigs and turtles and declare them as RAMSAR Wetlands.

5. Conclusion

A background with huge environmental problems could be designed in the future, due to slippage of the contribution of Wetlands to the environment due to in adequate interference of the related institutions including the wild life conservation Department who bears the primary responsibility of conserving the wetlands, though the wetlands in Sri Lanka is an essential factors, in maintain the environment, comparatively and the sustainability, without taking adequate steps to control the various threats and also considerable legal provisions have not been provided for the conservation of those wetlands.