6. MANAGEMENT RECOMMENDATIONS

1. Despite the diversity of habitats available for elephants in the reserve, crucial microhabitat such as freshwater swamps/vayals need to be protected for the conservation of elephants, which is critical during the dry seasons. Freshwater swamps are extremely important in terms of ecological function as well as their unique biodiversity value. These swamps have a variety of role to play in the system like checking floods, preventing erosion, mitigating the effects of natural disasters, storing rainwater, recharging groundwater aquifers, helping to remove a wide range of pollutants besides providing food and shelter to elephants. In the recent years due to climatic change these swamps/vayals lost their natural characters and also invaded with massive alien species and encroachment for cultivation, as results of those existing swamps were disappeared. The following are the few recommendations needs to be taken up urgently to protect the freshwater swamps inside the Mudumalai Tiger Reserve:

- Removal of invasive plants to the swamp eco-system including invasive tree species should be done. This will not only facilitate the recovery of native wetland species but also decrease the incidence of fire which could alter the hydrology of wetlands.
- Wide fire-line around each swamp will be maintained to further reduce the probability of wetland fires in the dry season.
- A critical feature of any restoration or rehabilitation effort must involve restoring the hydrologic processes that allow the existence and persistence of a shallow water table throughout the growing season. Bunds will prove effective in raising the water table and discouraging re-establishment of non-swamp vegetation.
• During the monsoon when the in-flow is high, a barrier at the mouth of the swamp would ensure that rainwater does not flood-off and is evenly distributed giving enough time for water to percolate.

• At least a foot level bund have to be constructed at the out-flow end to ensure excess water leaves the swamp.

2. The non-forest area (Agriculture and Settlements) of 650.9 ha is recommended to convert the non-forest area into forest land in the western side of the reserve which is right now with ‘Chetty’ tribes. This will not only help in adding 650.9 ha of prime swamp but also minimize the biotic pressure due to various activities.

3. The density of *Lantana camara* and their associated weeds affected the availability of grasses and also suppress the native vegetation. The invasive plant *Lantana* is dominant in understory cover, presently about 70% of the reserve. In this context it is relevant to mention that in the diet of elephant, grass constitutes about 60% by volume. Therefore, weed infested area has to be tackled for removal of this invasive species in a limited manner without altering the habitat to improve the grass pasture.

4. Forest fires are common in the forests of the Mudumalai Tiger Reserve during the peak of dry season. These wild fires are set by the villagers to get fresh fodder for their cattle, poachers- to get better visibility, tribals- easy to locate tubers and deer antlers and easy to move around in burnt areas. Wild fire causes severe damage to both wild flora and fauna. If there is a strict control over fire for a period of five years, the dry biomass gets accumulated and in the subsequent year if there is an outbreak of fire all the saplings of five years get charred. In the present study of fire frequency mapping revealed that Dry
deciduous (Shorea) are highly prone to fire. Hence following fire protection methodology have to be prescribed.

Pre-fire seasons (preparedness)

- Massive awareness has to be created well in advance among the public, local people of core area and adjoining areas so as to ensure their co-operation for the control of fire with the reserve management. In this connection the awareness can be created through district gazette notification, publicity through notice, through eco-awareness/ Interpretation centers, through media and through tom - tom in the adjoining area of Reserve.

- Fire monitoring watch towers play a crucial role in detecting fire and communicating the information to Forest Fire control station. Early detection of forest fire is one of the important factors for control. During the fire season firewatchers and staff should be stationed in these watch towers. These towers during fire season should be manned 24 hours. The anti-poaching camps and check posts, in addition to their regular work, should function as satellite fire centers.

Fire fighting operation (during fire season)

- Fire watchers should be engaged during the fire season (December to May or till the conventional rain starts) by the department from amongst the local population especially tribes.

Mudumalai Tiger Reserve has a good network of fire-lines, the fire-lines are traced in these well defined fire-lines. In the event of scarce resources, the fire tracing works are prioritized to cover the vulnerable locations. This work must be completed much before the fire season. In teak dominate areas the leaves need to be swept and burnt on the fire
lines even subsequent to fire line tracings. Apart from these, early burning or cool
burning can be taken up on a trial basis in few areas of the reserve.

5. Elephant corridors are very important for exchanging of gene between the populations
and prevent faunal collapse due to inbreeding. It is especially important for elephants for
feeding, breeding and seasonal dispersal between the landscapes. In recent years,
expansion of human habitation, Agricultural lands and development of resorts curtailed
the free daily movement of elephants. This could make elephant population to confine to
various sub habitats. During the present study six important crucial elephant corridors
were identified in and around Mudumalai Tiger Reserve and also prioritized them for
protection and further action. Singara – Masinagudi and Singara – Mavinalla are the two
important corridors need to be strengthened by way of rehabilitate the people from this
corridor land. Such management action not only helps in conserving the elephants in the
landscape but also conserve the whole biodiversity.

6. The present study revealed that ivory poaching has substantially affected the sex ratio in
the past; as a result absence of tuskers above the age of 30 is still a cause of concern.
Although the present sex ratio is in the positive trend. Elephants, especially tuskers
ranging outside the protected area are under threats in many of the territorial forest
division. Hence, anti-poaching work has to be strengthened as in the case of protected
area to safeguard the long ranging animal. Mudumalai is one of the areas with high
density of elephants in southern India. Even though patrolling and intelligence gathering
on poaching should be a year round activity, efforts should be stepped up during May to
August when there is usually a high concentration of elephants. The population structure
in these study areas should be monitored on a regular basis to understand the long term
dynamics of the population, particularly the possible changes in the ratio of tuskers *makhnas* and the growth rate of the population, to assess the impacts of ivory poaching on natural selection of *makhnas*.

7. Significantly increasing the elephant population over the years could have adverse impact on habitat and in turn affects the whole biodiversity as well. Hence, habitat management should be given highest priority in the schedule of operation by the reserve management to protect the integrity of the habitat.

8. Presence of high species diversity and richness indicates uniqueness and potentiality of Mudumalai Tiger Reserve for conservation of ecosystem in totality. The study recommends in depth inventory of plants and promotion of good governance is needed to protect the ecosystem. Elephant preferred food species such as *Kydia calycina, Grewia tilifolia, Acacia chundra, Tectona grandis* and *Zizyphus xylopyrus* need to be planted in the suitable location. It is necessary to plan a strategy for minimizing this issue so as to ensure the preservation of these habitats for elephants.

9. Stall feeding (Ficus sp.,) of elephants in the forest elephant camp at Theppakadu and Abayaranyam should be stopped and should allow the elephant as semi wild condition for foraging, it would minimize the selective damage on Ficus sp.,

10. The tree species damaged by people for collecting fuel wood collection drastically reduce the habitat integrity, especially in Masinagudi range. These activities could be streamlined through various Government measures, which involve the restoration of habitat diversity, using a strong afforestation programme wherever applicable. It would be appropriate to initiate Peoples’ Participatory Programmes for the forest dependent stakeholders to minimize the pressure in the habitat by providing alternate livelihood
schemes. Therefore, keeping a vision on sustainability as a key factor for any such programmes. It would be ideal of the Women Self Help Groups and the Eco-Development Committee are motivated and engaged.

11. Elephant conservation awareness programme conducted for the school secondary students revealed that students living within the reserve had more knowledge and awareness about the elephants than the students residing outside the park. After the awareness programme conducted students had understood the problem and gained more knowledge on elephant conservation. More conservation awareness programmes among students would be more helpful and effective in conservation of elephants and their knowledge on elephant and their behavior helps to conserve for the future generation.