

## Executive Summary

Weeds can be defined as a plant out of place, thriving in habitats disturbed by humans, possessing competitive behavior, and capable of mass movement from one area to another. Exotic weeds are very vexatious and aggressive than the indigenous ones. Many of them establish self-sustaining population outside their native range (Lodge 1993). According to Saxena (1991), 40% of the species in the Indian weed flora are introduced. Weeds are one of the major threats to natural environment. Major weed invasions change the natural diversity and balance of ecological communities. These changes threaten the survival of many plants and animals because the weeds compete with native plants for space, nutrients and sunlight.

Large extent of India's native vegetation communities have been invaded, or are vulnerable to invasion by exotic species that could result in changes to the structure, species composition, fire frequency and abundance of native communities.

Invasive plants can degrade the ecological integrity of wildlands, and land managers employ a range of tactics to reduce this damage. Controlling already established invasive plant infestations is important. However, stopping the introduction and spread of new invasive plant infestations is the most cost-effective approach to reducing this damage. Prevention is a key aspect of invasive plant management that deserves more attention.

*Chromolaena odorata*, a native of subtropical and tropical America from Florida to Argentina is commonly found in areas below 1000 meters altitude except undisturbed rain forest (Chevalier 1949, Waalkes 1953, McFadyen 1989, Gautier 1993). It is considered as a noxious weed in 23 countries of the world including India (Olaoye 1986, Torres and Paller 1989, Waterhouse 1994, Slaats *et al.* 1996). The weed grows in areas that are near sea level to areas > 1000 m elevation (Binggeli, 1999). It thrives in all types of well-drained soil and can grow on soils that are relatively low in fertility. It has infested millions of hectare of natural grazing lands in Asia and Africa. In Asia it is a major weed of the pasture and plantations and disturbed forests (Ambika and Jayachandra 1980, Leggitt 1983, McFadyen 1996, Slaats *et al.* 1996).

*Chromolaena odorata* locally known as Ranmodi has infested large tracts in Sanjay Gandhi National Park and has become a concern with the management of the park. Removal of *Chromolaena odorata* will give rise to area that can be converted into grasslands through natural or assisted natural regeneration. This will increase the availability of food for herbivores which in turn will help in increasing their population. Increase in population of herbivores may help in reduction of leopard straying incidences because leopards mostly stray out in search of prey and increased prey population inside the park will tend to keep the leopard within the park. Secondly removal of weed will ensure restoration of degraded ecosystem which in turn will ensure enhanced ecosystem services for human well being.

This project was undertaken as a pilot project in Tulsi range of Sanjay Gandhi National Park. Rapid survey was conducted to ascertain the spread of the weed. Secondary data available with the divisional office was examined. As there is no single methodology to combat the

spread of *Chromolaena odorata*, a mix of a number of removal methods were employed for control of the infestation of the weed. At the onset a one day workshop was conducted for this purpose and the staff was given an understanding of the problem and what technique needs to be applied in order to control the infestation.

The steps taken to curtail the spread of the weed are as under:

- The first step would be fencing the area temporarily to avoid grazing as animals can act as dispersal agents of the seeds.
- Soil and desirable vegetation in and around the project area will be left undisturbed as much as possible to prevent the introduction and spread of invasive plants.
- Care will be taken to minimize ground disturbance, as increased bare ground creates suitable habitat for invasive plant germination.
- Land-disturbing activities will be scheduled to occur prior to seed set to minimize spreading seeds as seeds may be present in the soil.
- Removal will be scheduled at early flowering stage (or well before seed development) to avoid spreading viable invasive plant seeds
- In case the plants are pulled out along with the roots, the emptied area will be promptly revegetated and/or mulched. This will stabilize soils and reduce the likelihood of invasive plant establishment.
- Those plants which will be impossible to be manually pulled out will be cut as much as possible close to the ground and will immediately be removed from the site.
- Care will be taken to prevent cut surfaces of invasive plant stems from contacting soil, to avoid root growth and reestablishment.
- Invasive plants with viable seeds or fruit attached will not be left on-site to dry out in an exposed manner.
- The removed plant material will not be discarded in any water source as this action may promote the spread of invasive plants downstream.
- All the plant material will be incinerated as soon as possible to avoid spread of the seeds.
- Areas where the plants are removed via cutting will be subjected to continuous monitoring and new growth will be immediately cut to suppress the growth. This process will be continued for at least three years to ensure complete removal of the plant

It is quite early to see the outcome of the project as complete removal from an area can be achieved only after three years.