

Policy Document

for

Managing Lantana (Lantana camara) in Himachal Pradesh

HIMACHAL PRADESH FOREST DEPARTMENT

GOVERNMENT OF HIMACHAL PRADESH

25/10

1. Background

Lantana camara (hereafter Lantana) is a pan-tropical weed. It occurs in diverse habitats and on a variety of soil types. It is a low erect vigorous shrub with stout recurved prickles and grows to 1.2-2.4 meters (or even more). It has a strong root system and it gives out a new flush of shoots even after repeated cuttings. *Lantana* is native to the tropical and sub-tropical regions of Central and South America. In India, it was first introduced in the early eighteenth century as an ornamental plant (Thakur et al., 1992) in Coorg, Dehradun and Kolkata. Since then it has invaded almost all the tropical areas across the country including Himachal Pradesh. It encroaches 13.2 million hectares besides forests and fallow lands. Its management costs per hectare are very high.

2. Invasion and Impacts on flora and fauna

Lantana aggressively proliferates and forms a dense mesh of bushes. This happens excessively at the edges of the forests with sparse canopy. It is known to produce allelochemicals that restricts the growth of other species under its canopy (Achhireddy & Singh, 1984). Hence, it replaces native flora, resulting in homogenous vegetation (Lamb, 1961). It significantly contributes to decline in the bio-diversity. *Lantana* can alter fire regimes in natural systems (Humphries & Stanton, 1992). Moreover fire has been reported to break the seed dormancy of lantana, causing high flash of invasion after fire treatment that is commonly used by forest department to restore the grasslands (Sharma et al., 2005). Consumption of its leaves has caused poisoning to cattle, buffalo, sheep and goats (Sharma et al., 1988). Over consumption of lantana leaves and shoots by wild herbivores has also been reported to be fatal for their health. Malarial mosquitoes have shown to be breeding in its dense thickets (Gujral & Vasudevan, 1983). Different varieties of ecosystem services have been altered by *Lantana*.

3. Management Interventions already made in the country and their outcome

Manual uprooting followed by replanting the native flora is the most preferred technique till now followed across the country. Resources are spent each year by Forest Department for *Lantana* management, though not much success is achieved in the process. Popular methods are discussed below:



a. Fire. This method is used for burning *Lantana* cover in grasslands and fallow lands. It is the most cost - effective technique in terms of efforts invested. However, many times native flora, nests of birds and shelter of other dependent fauna using the *Lantana* cover and other small animals are lost in the process. Moreover fire induces *Lantana* seed dormancy and hence high invasion *Lantana* is observed post fire (Hiremath and Sunderam, 2005).

b. Manual uprooting. *Lantana* thickets along the roadside and in understory are manually removed. Presently, it is the only method practiced for clearing the understory invasion. However this method cannot be used at large scale owing to the intensive efforts and repeated treatments needed each year.

c. Chemical. It involves the use of inorganic/organic herbicides. However the usage is limited by high cost of such programs. Moreover a detailed study on effects of such chemicals on components of biodiversity is needed before implementing such studies (Sharma et al., 2005).

d. Bio-control. In India, *Teleonemia scrupulosa* Stal. was introduced for bio-control of *Lantana*. But, control agent could not cope with the vigorous regrowth of *Lantana* at the onset of the monsoon rains; the control agent itself suffered heavy mortality during the winter months. Moreover a detailed study of effects of such agents on other organism is needed before implementing it to other regions (Sharma, 1988).

e. Restoration. Native plants are planted in the invaded patches (mostly after removing the major cover). However, desired result was not achieved. E.g. *Ficus* sp. and castor oil plants were planted to compete with *Lantana*, without much success (Troup, 1921).

f. Harvesting. Few non-governmental organizations started experimenting with *Lantana* to make furniture, pulp extraction of aromatic oils, etc. However, the scale of such usage is very small compared to the current extensive *Lantana* cover (Troup, 1921).

g. Adaptive eradication. One of the most preferred technique followed in the recent past was established by Babu et al. (2009). The procedure is; 1. cut below the root-stem transition zone 2. burn dried clumps 3. weed out *Lantana* saplings beneath the trees and from the surface of drainage channels originating from the invaded and uprooted area 4. restore grasslands and mixed woodlands.



Note of the present methods promises complete spatial or permanent eradication of Lantana.

4. Level of Invasion in Himachal Pradesh

A survey was carried out during the year 2010-11 and 2015-16 in the State to know the extent and level of invasion. The survey was carried out in all Forest divisions at beat level and compartment wise by quadrant method. Forest areas of 2,35,491.93 ha were found infested with *Lantana* with varying intensity. The seven territorial circles namely Dharanishala, Nahan, Hamirpur, Chamba, Bilaspur, Mandi and Shimla have significant infestation of *Lantana*. The intensity wise forest area infested with *Lantana* in the State is given below:

Intensity	<25%	25%-50%	50%-75%	>75%	Total
Area (ha)	53203.82	68244.03	73778.35	40285.74	235491.93
%	22.59	28.98	31.32	17.11	100

5. Purpose of the policy

- (i) To encourage all stake holders to work for *Lantana* eradication.
- (ii) To encourage *Lantana* based industry.

6. Interventions currently underway under various Schemes

The Himachal Pradesh Forest Department has started eradication of *Lantana* and its rehabilitation under State CAMPA Fund, Mid Himalayan Watershed Project (now closed on 31st March, 2017) and State Plan. The removal the *Lantana* is being done manually from the designated areas through *Cut Root Stock Method* (CRS Method). This method involves cutting the main tap root of *Lantana* plant beneath the coppicing zone (transition zone between stem base and rootstock). For this a specially designed digger (*kudal*) is used. Using this digger, the person cuts the main rootstock of *lantana* 3-5 cm below the soil surface by hitting the rootstock 3 or 4 times; while hitting the rootstock the blade of the digger gets lodged into the main tap root, at this point it is useful to move the handle of the digger in the forward direction away from the body of the person so as to sever the connection of the clump with the main tap root.

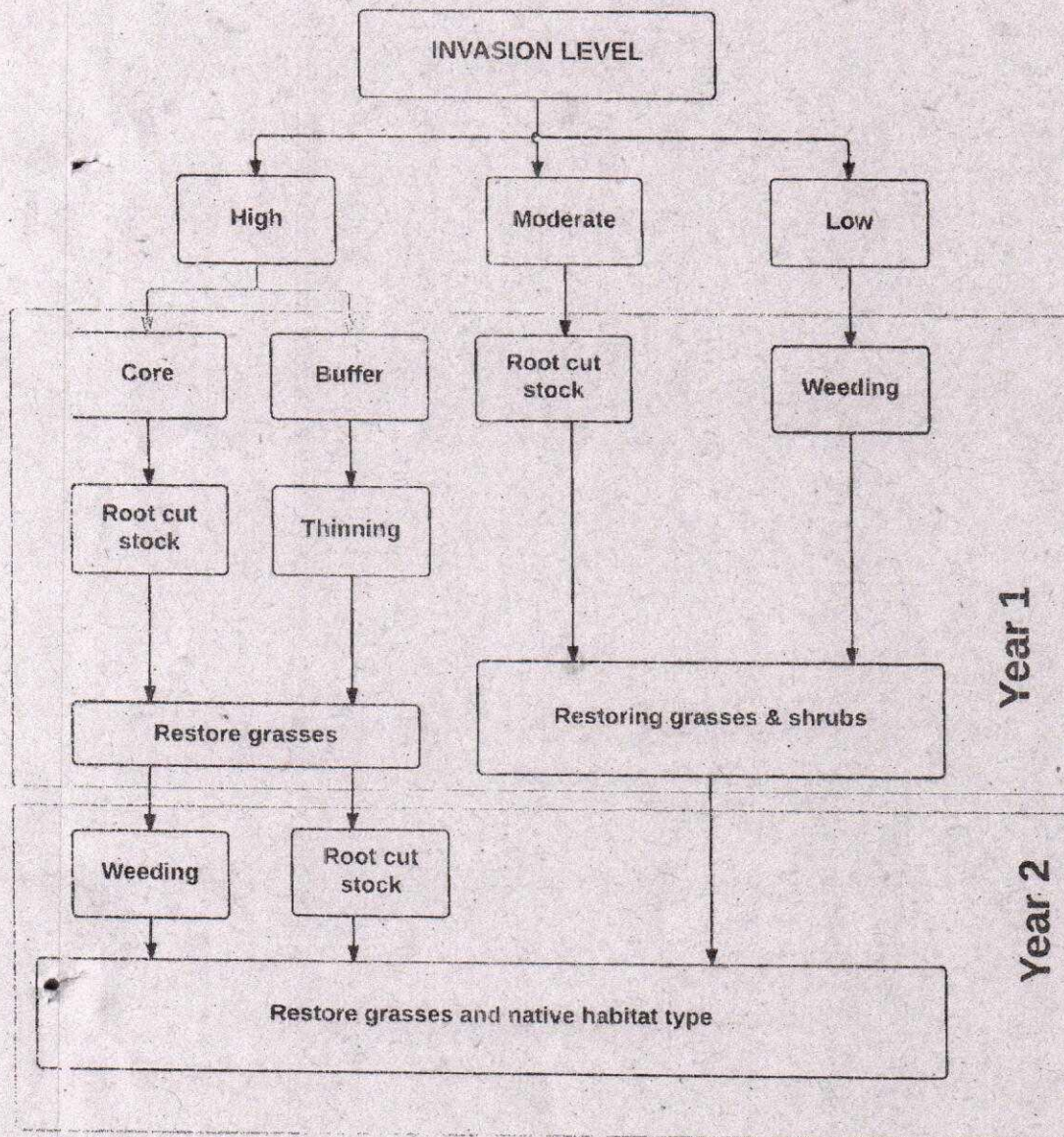


2813

A total of 38,000 ha have been treated from the year 2009-10 to 2015-16 and its rehabilitation is in progress by planting suitable species.

7. Suggested Model for Managing Lantana

The following model on the basis of existing knowledge and published information is proposed to manage and contain spread of Lantana in the State. The flow chart below suggests the strategy to be followed to approach the *Lantana* infested areas (Ramaswami et al. 2014) and (Love et al. 2009).



8. Incentivize Lantana Management by involving stakeholders



28/4

The issue of *Lantana* infestation and eradication was getting attention of the government since long. In order to control further spread of *Lantana* in the forest lands and to bring this area under productivity, increasing grazing lands for enhancing the livelihood of the rural populace is being given high priority. The per hectare costs of managing *Lantana* are very high and therefore the involvement of various stakeholders including private entrepreneurs, industrialist and youth clubs/mahila mandals/NGOs would greatly benefit in managing this weed. The eradicated *lantana* can be utilized for furniture production, artifacts, paper production, etc. This Policy envisages free of cost and incentive mechanism for eradication and usage of *Lantana*. The following guidelines are formulated which may be followed.

- (A) The Forest Division wise and Circle wise detailed information of *Lantana* infested area with level of infestation will be made available by the Department on the official web portal.
- (B) *Lantana* eradication will be carried out in the following broad categories:-
- (i) By the Forest Department directly with its existing resources (No additional staff either on daily wage basis, contract etc. be asked for).
 - (ii) By the Forest Department through contractors/tendering.
 - (iii) By the Panchayati Raj bodies.
 - (iv) By organizations located in the area like Mahila Mandals, Yuvak Clubs, NGOs, and Village Forest Management Societies (VFMS).
 - (v) By private factories like industries or their agents using *Lantana* as raw material.
 - (vi) By right holders.
 - (vi) By other Government Departments like Rural Development etc.

(C) Provision of funds

While Forest Department may utilize funds available under various schemes (no extra budget to be provided by the Government) which have provision for *Lantana* control as per norms of the scheme when it following (i) & (ii) above, funds will also be made available as following in other cases i.e. (iii) to (v). Convergence with MNREGA Funds will be aimed at.

- (i) In cases where Panchayats, NGOs etc. are involved, the norms developed by Forest Department from time to time may be applicable. The current norms are attached as **Annexure-I**.
- (ii) For private parties for use in industry by them or through their agents, 20% of approved norms of the department as incentive. Incentive will be provided only for eradication of *Lantana* in high invasion areas during the first year of eradication subject

2849

to availability of the budget. No incentive will be given for eradication in the same area during subsequent years.

(D) Encouragement of Industry:

(i) For Lantana uprooted by Department or through Panchayats, NGO's etc.:

In case an industry located in Himachal Pradesh requires Lantana as a raw material, the cut or uprooted plants will be made available at road side free of cost.

(ii) Own area Allocations: Private industry located in H.P. may request for allocation of area for use of Lantana. This request will be made to the CF of the circle from where Lantana is required.

- a) The CF will make yearly requirement assessment and make indicative allocation of larger areas with high invasion level for 10 years in order to augment supplies of Lantana raw material on long term basis.
- b) The CF will make firm allocation of area for eradication of Lantana only for one year at a time.
- c) Eradication of Lantana will be done by the concerned Private industry at their own costs along roadside areas.
- d) Private Industry can be given an incentive in areas without road access at the rate of 20% of the current norms for eradication of Lantana subject to availability of the budget with the department.
- e) In case budget is not available then private Industries will have to extract on their own.

(E) In above mentioned categories the concerned party/parties have to abide by the following conditions in order to achieve the objective successfully.

i) The Party/Parties will remove the lantana manually from the allotted areas through Cut Root Stock Method as discussed above. This method involves cutting the main tap root of *Lantana* plant beneath the coppicing zone (transition zone between stem base and rootstock). For this a specially designed digger (*kudal*) is used. Using this digger, the person cuts the main rootstock of lantana 3-5 cm below the soil surface by hitting the rootstock 3 or 4 times; while hitting the rootstock the blade of the digger gets lodged into the main tap root, at this point it is useful to move the handle of the digger in the forward direction away from the body of the person so as to sever the connection of the clump with the main tap root.

ii) The period of *Lantana* eradication will be from 1st November to 31st January of the financial year. The Party/Parties will not cause any damage to the forests and

246
nearby plantations while cutting and removing the *Lantana* from the allotted areas/forests. They will not remove any other vegetation.

iii) The Forest Department will maintain record/progress reports regarding removal of *Lantana*.

iv) The forest areas will be restored post *Lantana* eradication by the Forest Department to grassland communities as per the ecological requirement or can be developed into a forest ecosystem by planting native species under various schemes of the Government.

2617

Annexure-I

Sr No. Name of Scheme Name of Component Revised Norms for 2016-17 Remarks

Non Tribal Area Tribal-I Tribal-II Areas (Kaylong & Jhalma Ranges of Lahual Division)

Amount in Rs.

Norms for Lantana Eradication Under NPV

1.	Rehabilitation of Forest Areas infested with invasive Alien Species upto 25%	Year-1 clearing of Lantana infested Areas	10400.00	NA	NA	Revised Norms include -cutting /removal /Disposal of Lantana /Cut Root Stock method)	
		Total	10400.00	NA	NA		
		Maintenance					
		Year-2-1 st Maint.	2800	NA	NA		
		Year-3-2 nd Maint	1150	NA	NA		
	Total	3950	NA	NA	Cleaning of Lantana(Sprouts) & seeding one time after first cut for new areas and three times throughout the year for maintenance of cleared areas		
2.	Rehabilitation of Forest areas infested with invasive alien species upto 50%	Year-1 Clearing of Lantana infested areas	16750.00	NA	NA	Broadcast sowing of grass seed including cost of seed. Tending Operations Contingency for tools photo: documentation. workshops etc.	
		Total	16750.00	NA	NA		
		Maintenance					
		Year-2-1 st Maint.	4000	NA	NA		
		Year-3-2 nd Maint.	2050	NA	NA		
	Total	6050	NA	NA			

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3

2678

Renabilitation of Forest Areas infested with invasive Alien Species upto 75%	Year-1 Clearing of Lantana infested Areas	21100	NA	NA
	Total	21100	NA	NA

Maintenance

Year-2 1 st Maint	4600	NA	NA
Year-3-2 nd Maint.	2850	NA	NA
Total	7450	NA	NA

Note: These Norms are indicative and the works shall be chargeable as per actual.