

## Life+ Project Estuaries of the Basque Country: control and elimination of *Baccharis halimifolia* L. in Urdaibai

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*Baccharis halimifolia* is considered one of the most dangerous invasive species of Spain (GEIB 2006). In the Basque Country its distribution area covers all the estuaries, from Txingudi (Irun) to Barbadun (Muskiz) (Herrera & Campos 2010). The most affected estuary is the Biosphere Reserve of Urdaibai (Bizkaia), where more than 300 hectares are covered (A. Prieto, 2005).

The main objective of the Life+ Project "Restoration of habitats of the Basque Country's estuaries for community interest" is the elimination of the invading species *Baccharis halimifolia* in three estuaries of the Basque coast to assist the regeneration of the natural plant species. During the 2011, elimination works were carried out in over 190 hectares in the Biosphere Reserve of Urdaibai.

The elimination works are based on two control methods. The young specimens (lower than 50-75 cm.) are pulled out manually. The adult specimens are cut one by one, and brushed with an herbicide diluted in oil directly on the stump. Additionally, some test plots have been established in two different environments of the marshes, to compare the effectiveness of using water or oil as diluents in different concentrations.

Finally, a monitoring is implemented to check the results of the actions by establishing plots and transects Two months after the conclusion of the works, data of the recovery of the native flora, resprout of the treated specimens and seed germination are taken. The preliminary results show that the selected methodologies are effective, but it is necessary to continue with the control works to avoid the resprout. The native species are recovering satisfactorily, mainly species as *Phragmites australis*, *Atriplex prostrata* and *Juncus maritimus*. *Baccharis halimifolia* is present in all the plots, but its presence is decreasing. The average of resprout is over 38%, but variable between plots and transects (Figure 1).

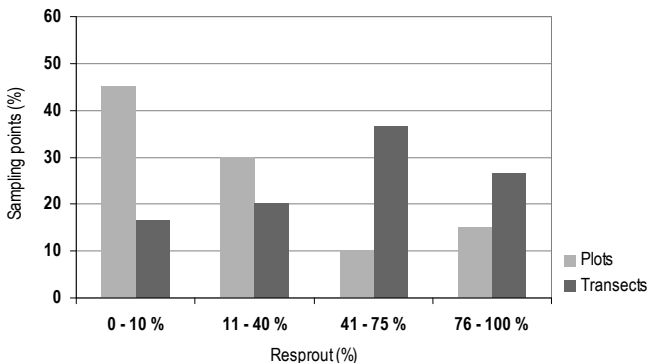


Figure 1. Resprout average per sampling point

Generally, greater the number of stumps, the effectiveness is higher (Figure 2).

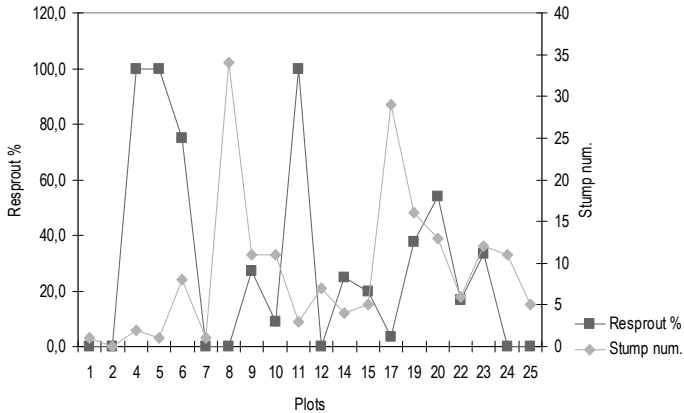


Figure 2. Number of stumps and resprout average per plot.

The most positive result is that the seed bank is decreasing because of the continued elimination works carried out for the last years (Gobierno Vasco 2011)

In regard to the test plots, it seems that the diluents and concentrations are not decisive for the effectiveness, but the specific conditions of the environment where this methodology is carried out (Table 1). In particular, in places with a high saltiness and flooding grade (Zone B), the results are much more effective than in dry lands (Zone A).

Table 1. Summary of results in test plots

	Zone A plots			Zone B plots		
	A1	A2	A3	B1	B2	B3
Stumps	22	11	17	23	24	20
Resprout	19	10	15	0	0	4
Resprout (%)	86,4	90,9	88,2	0	0	20,0
Seedlings	10	18	6	9	0	5

**References**

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