DEPARTMENT OF AGRICULTURE AND ECOLOGY
FACULTY OF LIFE SCIENCES
UNIVERSITY OF COPENHAGEN

Uprooting and burial of invasive alien plants: a new tool in coastal restoration?

Johannes Kollmann[1,2], Kasper Brink-Jensen[1], Sally I. Frandsen[1] & Mille K. Hansen[1]

Background

Invasive alien plants are a problem for conservation management, and control of these species can be combined with habitat restoration. Subsoil burial of uprooted plants is a new method of mechanical control, which might be suitable in disturbed habitats.

The method was tested for *Rosa rugosa* (Japanese Rose), an invasive shrub in north-western Europe with negative effects on biodiversity in coastal dunes (Fig. 1).

Fig. 1. Restoration of coastal dunes in north-eastern Denmark by uprooting and subsequent burial of the invasive alien *Rosa rugosa*. and resprouting of buried fragments.

Results

Two months after uprooting and burial in dunes of north-eastern Denmark, 97% of the 58 shrubs resprouted from roots and rhizomes; on average 41 resprouts per shrub. Resprout density was twice as high at former shrub margins compared with the centre (Fig. 2).

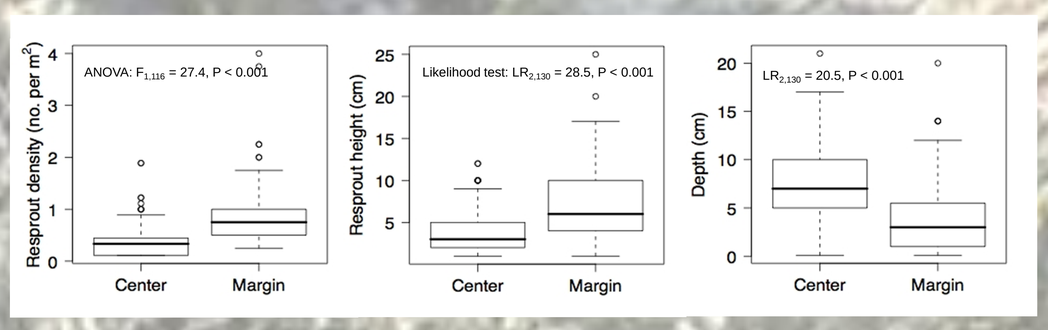

Fig. 2. Resprouting of *Rosa rugosa* shrubs two months after uprooting and burial in coastal dunes. There were significant differences between the former shrub centre and the margin in density of the regenerating shoots, shoot length and depth of the fragments from which the shoots emerged.

Resprouts were taller and originated from more superficial soil layers at the shrub margin than in the centre.

Resprouting was negatively correlated with fragment depth, and no resprouts were observed from >15 cm depth (Fig. 3). The number of resprouts increased with fragment dry mass (0.5–168.5 g).

After 18 months with harrowing the species was still resprouting, flowering and fruiting, albeit with no difference between shrub margin and centre. Resprouts were taller (26 cm) and coverage was higher (0–4%) after two times harrowing, whereas no difference was found in cover of native dune species (1–5%).

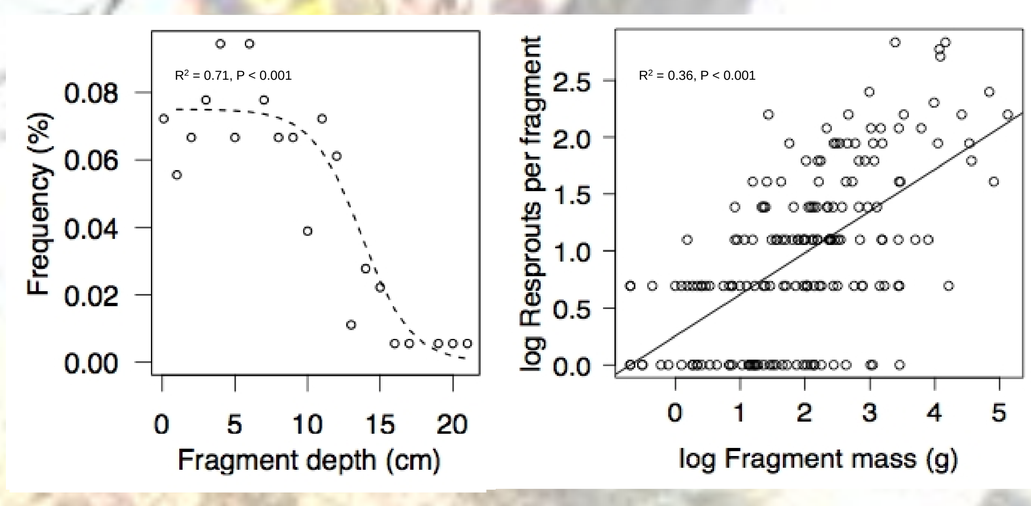

Fig. 3. Frequency of resprouting fragments of *Rosa rugosa* was negatively correlated with burial depth, and the number of resprouts per fragment was positively correlated with fragment dry mass (including resprouts).

Conclusions

- The results demonstrate that even small fragments of *R. rugosa* resprout, and that resprouting persists despite repeated harrowing.
- Careful subsoil burial of all fragments is necessary, special attention should be paid to the shrub margin, and follow-up treatments are needed.

Kollmann, J., Jensen, K.B., Frandsen, S.I. & Hansen, M.K. (2011) Uprooting and burial of invasive alien plants: a new tool in coastal restoration? *Restoration Ecology*, **19**, 371–378.

[1]*Dept Agriculture and Ecology, University of Copenhagen, Rolighedsvej 21, 1958 Frederiksberg C, Denmark*
[2]*Restoration Ecology, Technical University Munich, Emil-Ramann-Strasse 6, 85350 Freising, Germany*