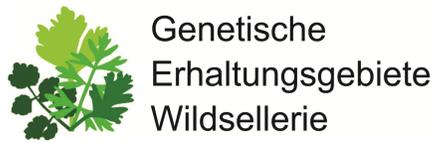


Establishment of Genetic Reserves for Crop Wild Relatives

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Introduction

While great progress has been achieved in organizing *ex situ* plant genetic resources conservation programs, the implementation of the *in situ* conservation strategy is lagging behind. The deployment of the genetic reserve conservation technique has been suggested to facilitate *in situ* conservation measures. A four step methodology for the identification of genetic reserve sites for a target crop gene pool has been developed (Maxted *et al.*, 1997, Maxted and Kell, 2009) and is operative.

The technique entails the identification of occurrence representing the spectrum of intraspecific diversity of a species. The establishment of genetic reserves in a formal, regulatory sense has not been achieved so far. The latter is the main objective of the model- and demonstration project "Genetic reserves for wild celeriac species (*Apium* and *Helosciadium*) as component of a network of genetic reserves in Germany". Four wild celery species distributed in Germany were chosen as model objects for two reasons. Firstly, the species are suited to enhance the crop breeding pool (Melchinger and Lübberstedt, 2003; Wang *et al.*, 2011). Secondly, the species have been classified as threatened. The agricultural and nature conservation sector thus have a common interest in improving the conservation status of the species.

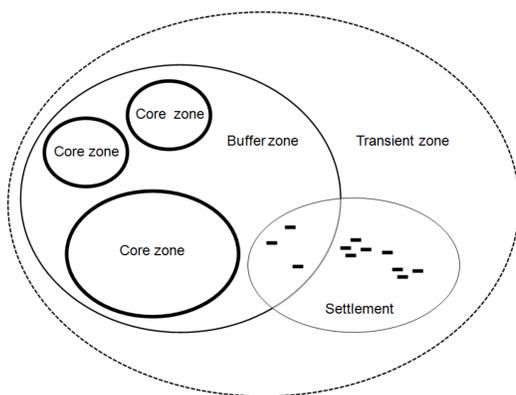
The project is implemented by the Julius Kühn-Institut, Institute for Breeding Research on Agricultural Crops, Quedlinburg (coordinator)¹⁾, the Botanical Garden of the University of Osnabrück²⁾, and the Albrecht Daniel Thaer-Institute for Agricultural and Horticultural Sciences of the Humboldt-University, Berlin³⁾. The project team is supported by the Federal Nature Conservation Agency, Bonn, the German Federation for Plant Innovations, Bonn, the Bavarian Academy for Nature Conservation and Landscape Management, Laufen, and ten nature conservation agencies located in the Federal States.

Species, habitats, distribution pattern



1st row: *Apium graveolens* subsp. *graveolens*. Habitat at Sülldorf.
2nd row: *Helosciadium repens*. Habitat in Sachsen-Anhalt.
3rd row: *H. nodiflorum*. Habitat in Rheinland-Pfalz
4th row: *H. inundatum*. Habitat at Boye, Niedersachsen
Maps: © GeoBasis-DE / BKG 2007 und 2013

Genetic reserve: design



Model of a genetic reserve for crop wild relatives (based on Maxted *et al.*, 1997).

The figure depicts plant groups spread over three core zones altogether constituting a meta-population. These groups are united in the buffer zone. Together with the transition zone the buffer zone serves protecting the core zone and to allow for fluctuations and migration of the species on a small scale.

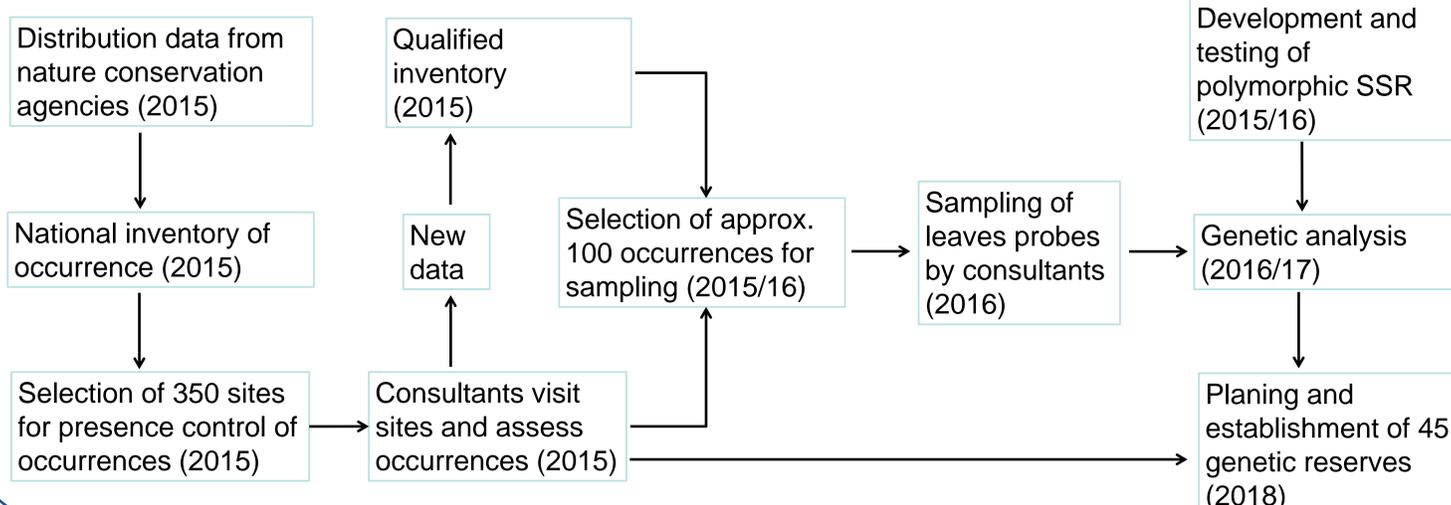
Related crops

The continued adaptation of the wild species generates genetic variation which can be used for broadening the breeding pools of domesticated forms.



Apium graveolens subsp. *graveolens* is the wild ancestor of Cutting celery, *Apium graveolens* var. *secalinum*; Celery, *Apium graveolens* var. *dulce*; Celeriac, *Apium graveolens* var. *rapaceum*

Identification of genetic-reserve sites: the work flow



Accompanying actions

- Network Memorandum of Understanding
- Communication strategy
- Proposal for a *in situ* management strategy
- Species-specific management plans
- Project web site
- Portal for genetic reserve sites