Natural regeneration of *Vitis vinifera* L. subsp. *sylvestris* (Gmelin) Hegi on a Rhine island near Ketsch

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The habitat

The Rhine island Ketsch 4 km north-east of the city Speyer is the habitat of one of the last "big" spontaneous wild grape populations in Central Europe.

Photo: Erika Maul

Photo: Norbert R. Kowarsch

Photo: Erika Maul

Preservation status

In the past almost no natural *V. sylvestris* regeneration was observed.

However after the flood in 2018 and 2020, several hundred seeds germinated and also perennial seedlings were found.


Photo: Marion Niederl


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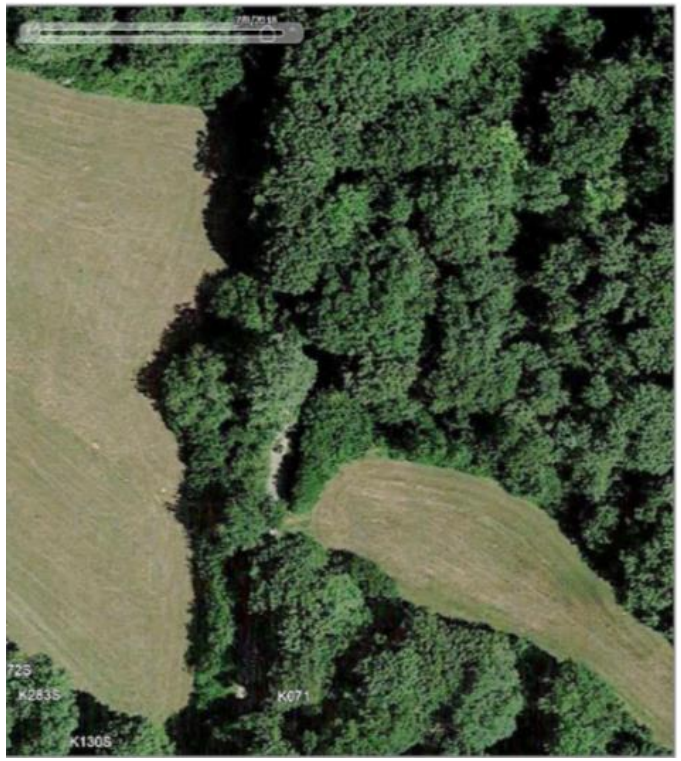
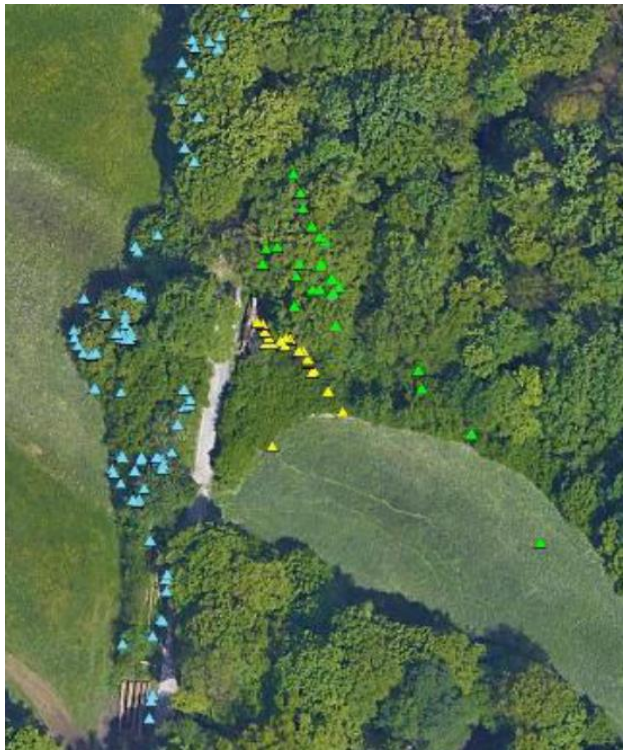
Actions to promote germination and growth

Clearing of the edges and thinning was done according to Flora Fauna Habitat (FFH) – regulations.



2018

2019, after clearing and thinning



2020, seedlings (triangles)

Satellite photos were taken from:
Oberrhein VITAL– der *Vitis vinifera* ssp. *sylvestris* Arten-Management-Leitfaden für die Naturschutzpraxis.
Phase II: Verjüngungskonzept Rheininsel Ketsch – Interim report 2020

Protection of seedlings

If the seedlings were found in time,
protection areas could be clearly demarcated (red color sticks) and temporarily withdrawn from use.

Photo: Marion Niederl

Genetic diversity and fertilization study

Genetic analysis was performed in 2020 to identify progenitors and to study introgression rate from the cultivated compartment:

- 238 seedlings and 68 Ketsch individuals were genotpyed with 35 SSR-markers
- Trios were determined for 101 seedlings and thus the spatial relationship between pollinators and mother plants could be ascertained
- The farthest pollination distance was at 905 m
- Mean distance between pollinators and mother plants amounted to 198 m
- Either the seedlings germinated in the immediate vicinity of the mother or in a distance of up to 430 m
- Introgression rate represented 2,52%

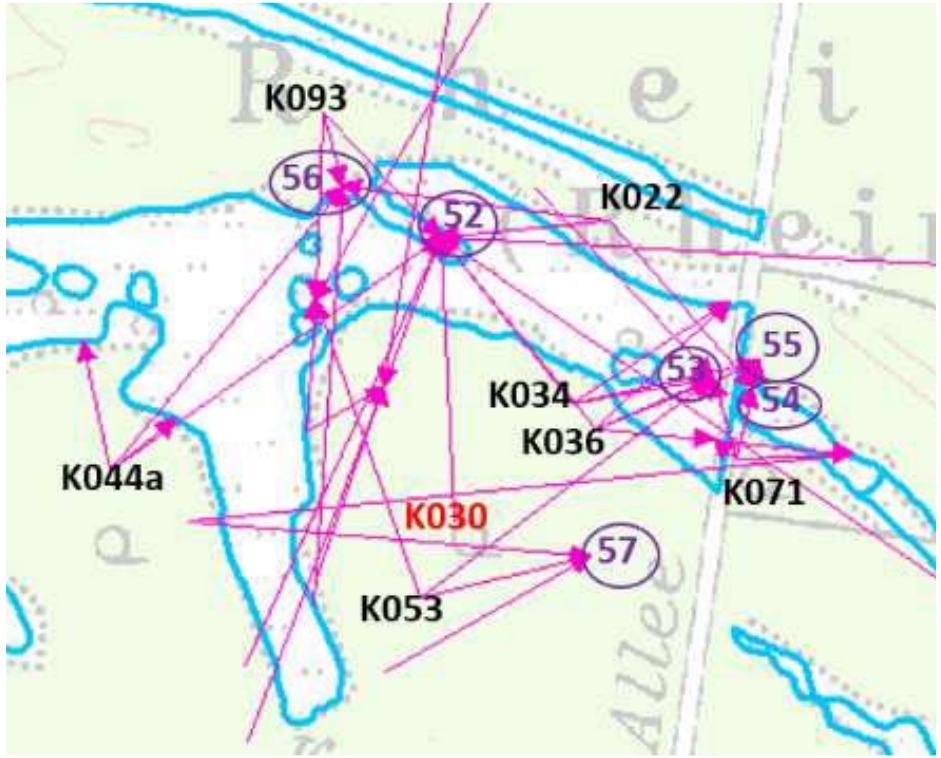
Details

Trios:

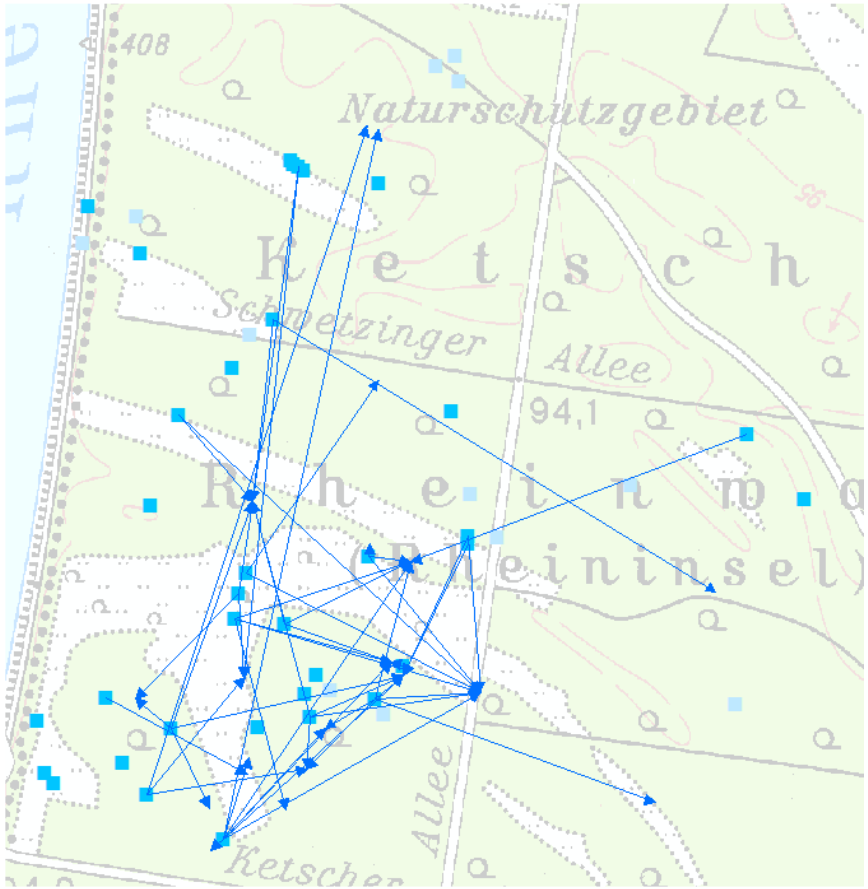
- 27 female and 21 male parents were indentified
- 56% of the seedlings descended from 3 females only
- 33% of the seedlings descended from 3 males only
- Monitoring is needed to maintain still existing genetic diversity (genetic basis is narrow due to bottle neck and genetic drift)

Location of parents

Location of the most frequently involved mother plants (black) in relation to the offspring sites (violett)



Pollinators (light blue boxes) and mother plants (arrow) of the trios.



Figures were taken from:
Oberrhein VITAL– der *Vitis vinifera* ssp. *sylvestris* Arten-Management-Leitfaden für die Naturschutzpraxis.
Phase II: Verjüngungskonzept Rheininsel Ketsch – Final report 2021

Conclusion

Gerhard Alleweldt (1965)

considered the Rhine valley as a small micro gene center of *Vitis sylvestris* :

"a small, in itself closed area that is isolated from the environment due to special terrestrial or climatic conditions and in which a high diversity of forms was able to develop“.

Monitoring is needed to preserve the genetic diversity

Diversity of seed size and shape of distinct Ketsch-individuals

Photo: Norbert R. Kowarsch

Photo: Doris Schneider

Thank you for your attention

Photo: Erika Maul