

## **Scottish Crab Apples *Malus Sylvestris* of the Galloway Glens** **Scotland's native 'Forest Apple' the Scroggie**

Scroggie is a local Scot's word for crab apple, wooded pasture and small wild woods

**The Project** for Galloway Glens Landscape Partnership - March 2022-2024  
with South West Community Woodlands Trust managed by Jools Cox and Jen Stephenson.

### **Wild Apple of the Galloway Glens** - How and why did we start?

Galloway's traditional domestic orchards tend not to be ancient, our mild, damp climate produces domestic apples that are prone to rot, poor cropping and canker caused by the stress of wind and damp, therefore many cultivated domestic varieties do not have a long life. However, we do have our native crab apple tree *Malus sylvestris* - hardy, long lived, scrubby trees often found in ancient hedgerows, drove roads, in the middle of pasture on knowes, and in hedge remnants. In spring their shock of ragged branches burst into soft pink or white blossom; in autumn the ground below them is marbled with tiny green, yellow apples. These golden orbs are hard and so tart that your mouth puckers, completely unsuitable for snacks but a delight to cooks, cider brewers, insects, animals, and the blossom a great pollinator for the domestic apple.

We believe these apples could play a very important role in the longevity and survival of our domestic apple varieties.

**In 2017**, two passionate crab apple enthusiasts, scientists from Perthshire, **Rick Worrell and James Renny** expressed an interest in collecting a few crab apple leaves from Galloway to DNA test them to see how native they really were. This was part of a Scotland wide survey, to distinguish true native trees from those that have been cross pollinated by insects from domestic apples.

South West Community Woodlands Trust 'Orchard and Wild Harvest Project,' and Dr Mary Anne Smyth, sent out emails and within a month we had volunteers who collected over 50 samples from the region.

**In February 2018**, Rick and James returned to Galloway with the interesting and exciting results. The DNA analysis (by Markus Ruhsam at Royal Botanic Garden Edinburgh) showed that most (more than 75%) of the Galloway crab apple samples were native Scottish forest apples. This threw up lots of questions, how long have they been here, why have they not hybridised like most others in the UK, how are they distributed, what are their favoured locations? Could Galloway be a hotspot for native pure crab apples? What do we do with this knowledge and how do we proceed? Lots of questions had to be answered and the data analysis expanded.

**In 2021** the Darwin Tree of Life project was launched which eventually aims to sequence the genome of all 60,000 species of life in Britain and Ireland. 25 apples including the crab apple had their genetic 'blueprint' sequenced by the Royal Botanic Garden Edinburgh. It was time for a local project to identify our local native crab apples and preserve the knowledge and the seeds for the future.

For our project we were not interested in trees in gardens, nor did we want samples from trees likely to be pollinated by insects that may have been foraging on domestic apples thereby creating hybrids. We needed samples from remote trees with the characteristics of the wild native.

**In March 2022** the project stepped up a gear with £5,000 funding from **Galloway Glens Landscape Partnership** Jools Cox and Jenny Stephenson of ‘South West Community Woodlands Trust’ undertook development of the project to encompass - the community, education, cultural heritage, food futures, climate change, social history, and wellbeing.

There were so many aspects of local crab apples to be explored each question leading to another the first thing was identification, collection of leaves in the summer and further DNA testing.

**In early July 2022** we asked volunteers to collect a leaf from trees in their location that they thought may be native. Trees with small glossy leaves, not much, if any, down on the underside, short stems and sometimes thorny branches.

The location of the tree was recorded by OS grid reference. The volunteer ‘Citizen Scientists’ put the leaves in plastic bags with silica gel, labelled with location and sent them for Genotype/DNA analysis by Edinburgh Royal Botanic Garden scientist Markus Ruhsam.

The results are in and are very exciting. Out of the 113 samples tested 92 were definitely native *malus sylvestris*. 81% of our samples. A very high propensity.

**March 2023** We have had interest from Gayle Volk USDA who would like seeds for their seedbank, and Nick Howard in the Netherlands who wants leaf samples of our natives for a genetic mapping of crab apples in Europe.

All results and a pictorial map will be put on the website in due course, along with walks and cycle routes to see the trees.

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### **Further Research**

#### **Further research to be undertaken by SWCWT Crab Apple Project**

Location of trees in relation to transport routes past and present.

Location of trees in relation to cow pasture and possible drover’s routes.

The dates when the tree blossoms

Characteristics of our natives

The average length of the yearly stem growth

The quantity, size and colour of fruit each tree produces

The taste of the apples when just fallen, and after keeping

Further uses for Crab Apples

Best methods of propagation, questioning grafting methods, layering, cuttings etc

It will also be interesting to learn more about the relationship between cows-and-apples - how many of the crab apple trees are in old cow-pastures?

Do the apple seeds germinate better in cowpats? Why do crab apples not germinate freely?

Is Apple Wooded Pasture (cattle-grazed open woodlands and scraggy parks) part of the story, an old Galloway legacy?

This data will be useful if, in the future, our domestic trees suffer disease, fungal infection, or suffer effects of climate change. There may be genetic qualities that could prove beneficial to our domestic apple.

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## **The Crab Apple *Malus sylvestris* (Rosaceae)**

Crab Apple *Malus sylvestris* (Rosaceae) is also known as Wild Apple, Wild Crab, Aball (Irish) Gribble, Grindstone Apple, Bittersgall, Wilding tree, Griggles- (small apples left on the tree after leaf fall), and no doubt many other regional names, do let us know!

The word *malus* L. bad, evil, seen as a negative, malignant, malnourished, malfunction.

The word *sylvestris* L. *sylva* is wood, *vestris* refers to the manner of growth, being scrubby, gnarled, twisted, crabbed. Twigs often develop spines giving a crabby nature.

So, the crab apple has a poor press, evil and scruffy, if you are feeling grumpy, nippy, possibly a bit sour, you may say you are feeling 'crabbit'!

Perhaps this is why, despite being one of the prettiest and a highly productive native tree of Scotland, the Crab Apple is the least understood and very under appreciated.

### **Description**

The Crab Apple is a deciduous, broadleaf, dome shaped, slow growing tree and grows to 10-15m. It is sometimes difficult to spot in a mixed woodland as the blossoms are often above the tree canopy, however, in winter the bright yellow/green 'crabs', often flushed with red, become obvious on the tree, and littering the woodland floor.

The green, glossy, oval leaves up to 6cm with rounded triangular teeth, alternate on the shoot, and distinctively, the underside has few or no hairs. Domestic apples often have a downy underside. The leaves are often folded or appear crumpled. The stalk is 2-3cm long and spur shoots may bear a thorn. The bark is smooth and green brown with large orange breathing pores (lenticels) older trees have scaly ridges.

The blossom consists of white or pink flowers in clusters of four to seven appearing with the leaves in the spring.

The globe shaped fruit, 2-3cm by 2-4cm, are yellow/green sometimes flushed with red and carry the remnants of the flower, they have a sharp, dry and slightly sour taste when raw but make excellent jelly and can be roasted with game or roast meats. Fruits can be gathered September to October but may stay on the tree until the following spring withstanding the fiercest of gales.

Fallen fruits are foraged by cows, badger, rabbit, hare, voles, mice and the empty shells indicate squirrel activity searching for pips.

The trees are long lived some 100-150 years old, some have a girth of one and a half metres.

The Crab Apple has 57,000 genes, 36,000 more than humans, we share 40% of our DNA with apples, perhaps that is why, 'an apple a day keeps the doctor away!'

### **Habitat**

A survey and paper written by Markus Ruhsam, Rick Worrel and James Renny (Nov 2022) reports that many *malus sylvestris* sold in UK tree nurseries are not 'pure native' as the seed may have been collected from trees in the vicinity of domestic apples therefore hybridised. The pureness of the 'mother' tree depends on its isolation from other hybridised crab apples and domestic apple trees. Many of the trees in our survey have these pure qualities as they are in remote locations.

It is vital to maintain the natural genetic purity of the Galloway stock as an important genetic resource for improving commercial crops in the future. Our Galloway trees

have a vital role in food security, we also need native crab apples in seed banks and nursery beds to help regenerate or replenish our native stock.

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### **References**

A Handbook of Scotland's Wild Harvests edited by Fi Martynoga

For more info on Crab Apple Project

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[content/uploads/2017/09/Worrell-Crab-Apple.pdf](http://www.reforestingscotland.org/wordpress1/wordpress1/wp-content/uploads/2017/09/Worrell-Crab-Apple.pdf) for the article Rick Worrell wrote in

2017 for Reforesting Scotland;

Ripest Apples by Roy Palmer The Big Apple Association ISBN 0952 9100 04

Verification of Wild Apple (*Malus sylvestris*)nursery stock sold in United Kingdom

Markus Ruhsam, James Renny, Rick Worrel Nov 2022 Plants, People, Planet/Vol. 5

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