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Research article

Supplement to Faroe Islands botanical list with 64 species or subspecies including rare, new and potentially invasive species with comments

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The supplementary botanical list features 64 species of vascular plants which are new, rare or forgotten records from the Faroe Islands. They are the cumulative notes produced from numerous excursions over the two last decades. The new species are described with notes of who discovered them, and literature references are given where appropriate. Some plants are not new discoveries for the Faroes but have been found in new localities or have been missed in most recent botanical lists. The plants are also categorized to relevant land management practice such as infield or outfield, altitude, and whether they show spreading potential, in the hope that this may guide future management and conservation of the rare and extinction prone species found in the Faroes. Fifteen non-native taxa in the list have been categorized as showing 'spreading potential' and may become invasive, e.g. *Schedonorus arundinaceus*, *Alchemilla mollis*, *Epilobium komarovianum*, *Fuchsia magellanica*, *Reynoutria japonica* and *Mimulus/Erythranthe* spp.

Keywords: botanical list, community science, invasive species

Introduction

The Faroe Islands (Faroes hereafter) are a North Atlantic archipelago (62N 07W) of 18 small islands (Fig. 1). The plant life in the Faroes has previously been reported in several extensive lists, most recently in Jóhansen (2000). The aim of the present publication is to provide a supplement to the most recent and up to date plant checklist for the Faroes. It is the result of a large number of trips and expeditions between 2000 and 2021 undertaken by the local Faroese amateur botanists Dániel Jespersen (D. J.), Annleyg Patursson (A. P.), Marita Gulklett (M. G.) and Jens-Kjeld Jensen (J.-K. J.) ph.d.h.c. The observations of other botanists are also included and most of the mountain trips have been guided by local farmers or landowners. Furthermore, over the past two years, Rodmund á Kelduni (R. áK.) – also a local Faroese amateur botanist

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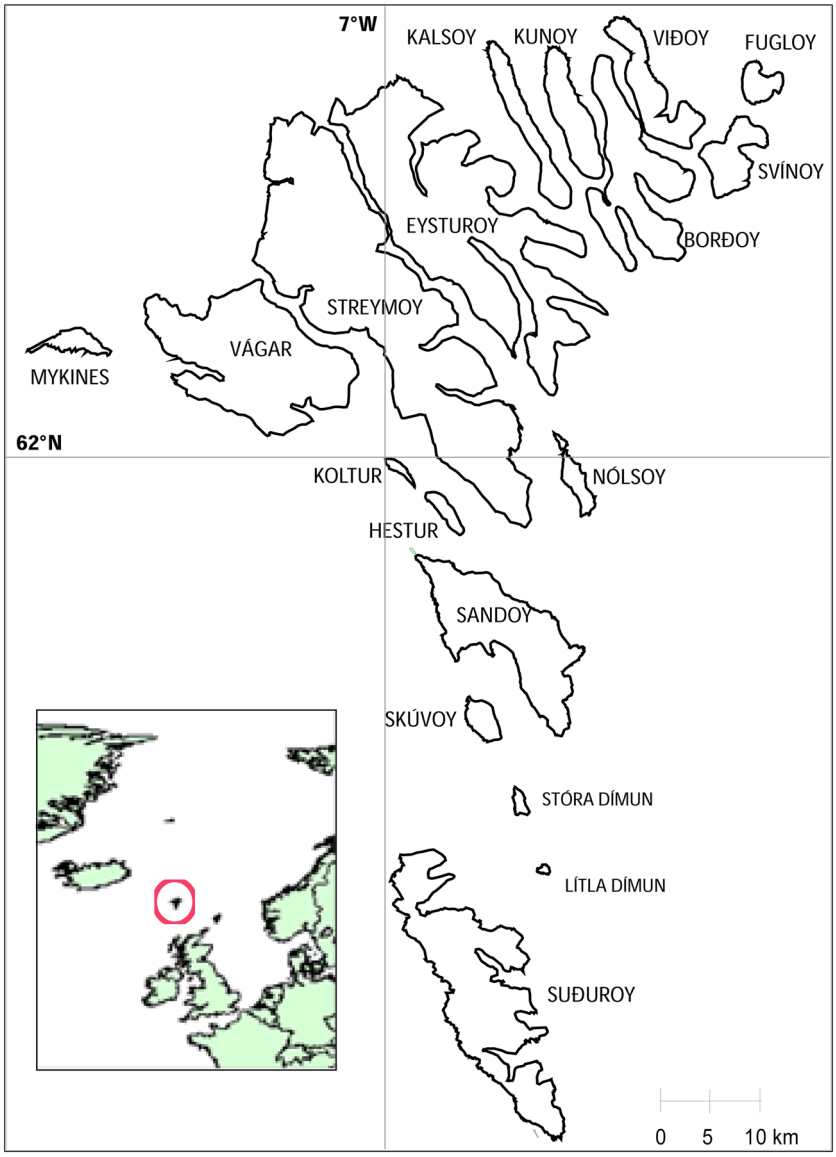

Figure 1. Map showing the location of the Faroe Islands, and a more detailed map featuring all the island names.

– has added valuable contributions by collecting and sharing observations.

During the summer 2021, a botanical expedition lead by the Danish nature interpreter Flemming Thorning-Lund (F. T.-L.) resulted in several new and other records of interest for the Faroes. All of these were published in full in Danish by Lambertsen and Thorning-Lund (2021).

The plants which Jens-Kjeld Jensen and Flemming Thorning-Lund have determined (Det.) are kept in their own private collections. Plants which Simon Lægaard, Benjamin Øllgaard and Jens Christian Schou have determined are held in herbarium AAU and the two *Epilobium* species determined by Sven Snogerup are in LD. The plants which are mentioned as 'personal comments' (pers. comm.) have not been collected or sampled.

Some key drivers of plant community change which are detrimental to the plant communities in the Faroes are grazing, land use development and climate change (Ostenfeld 1906, Fosaa et al. 2005, Haraldsstovu 2020). It is with this and other conservation challenges in mind that we report not only sites where the plants are found, but also in which type of areas they are found. While the limits between infield and outfield are not formally well defined in the Faroes, there are in general terms quite notable differences in the land management between the infields and outfields, which are important to recognise in relation to plant management and conservation. Infield signifies plants which are found in towns or villages. They typically have a low grazing pressure as most towns are fenced off from sheep grazing. However, fertilization and land development of various kinds is perhaps the main threat to infield plant diversity. In the outfields, grazing by sheep is the primary driver of vegetation change and determinantal to plant diversity in the Faroes (Ostenfeld 1906, Hansen 2013, Haraldsstovu 2020).

Faroese legislation only permit agricultural fertilization below 250 m a.s.l. (logir.fo 2022), but this distinction is perhaps more administratively relevant than biologically meaningful. However, it can be assumed that the risk of fertilization is lower above 250 m a.s.l. as this requires a dispensation from the law.

The species and subspecies listed as new below constitute the first verified records of these plants in the Faroes, although for some there exist local anecdotes or personal comments which we reference. 'Missed in recent literature' indicates that, although being mentioned in older references as found in the Faroes, these species have not been listed in the most recent checklist of Faroese plants (Jóhansen 2000). The reason for their omission is usually not known. The plants referred to as having 'spreading potential' are plants which have been seen to spread either or both in the infield or outfield. We have included plants which have been imported to the Faroes but have been found outside of the area where they have originally been planted – either infield or outfield. Some plants are designated as rare species. This is an evaluation of their distribution and occurrence in the Faroes and many of these species are only found in one or a few sites. For some their state of rarity are uncertain or doubtful and these are then mentioned within brackets. A dash '–' indicates that a plant is very rare and possibly extinct from the Faroes. Several unsuccessful attempts have been made to locate these species.

There is currently no legislative protection of rare or threatened plants in the Faroes. A redlist was made in 2005 (Fosaa et al. 2005), but has not been legally ratified by the Faroese government. There are no restrictions on importation of plants to the Faroes and there is currently no 'black list' of invasive organisms. This liberal attitude has inevitably resulted in a growing number of non-native organisms establishing in the Faroes, with unpredictable effects on the native flora and fauna (Jensen and Madsen 2018, Hammer and Jensen 2019, 2021).

The following list includes the scientific name of the species, and in brackets their English and Faroese names are given when known. Nomenclature is according to Dyntaxa (2022), and the systematic arrangement follows Mossberg and Stenberg (2018).

List of vascular plants

Lycopodium annotinum L. (interrupted club-moss – lyngjavni) (Fig. 2). A species native to the Faroes. It was first found in 1903 as reported by Jóhansen (2000), but has not been reported since. On 13 Aug. 2013 it was rediscovered assumingly in the same site, but it has only a very small and vulnerable population. Leg. M. G., J.-K. J. Det. J.-K. J.

Equisetum hyemale L. (rough horsetail – vetrarbjølluvísa). A species native to the Faroes. First found 1960–1961 by Skála, Eysturoy (Hansen 1966). Jóhansen (2000) listed it as very rare and only found on Eysturoy. The species has since then been found close to Norðskála and Rituvík on Eysturoy and by Húsar on Kalsoy. Leg. D. J., A. P., J.-K. J. Det. D. J.

Figure 2. *Lycopodium annotinum*, Streymoy, 13 Aug. 2012. M. G. Near the only known population. Photo: J.-K. J.

Equisetum variegatum Schleich. ex Weber and Mohr (variegated horsetail – lítil bjølluvísa) (Fig. 3). A species native to the Faroes. Found once before in 1960 on Kalsoy (Hansen 1966). A small population on Kalsoy was found 8 Aug. 2012. Leg. D. J., M. G. Det. J.-K. J., F. T.-L.

Figure 3. *Equisetum variegatum*, Kalsoy, 20 July 2013. Photo: J.-K. J.

Asplenium adiantum-nigrum L. (black spleenwort – svartur trøllakampur) (Fig. 4). A species native to the Faroes, but very rare (Jóhansen 2000). It has been found at two separate sites on the southern part of Eysturoy. At both sites D. J., J.-K. J. found and counted 28 specimens on 12 Aug. 2014. On 9 July 2020, D. J. found no specimens at one site, but counted 12 specimens on the last known site. This taxon must be considered very threatened, and fertilization with carboxylic acid offal effluent from the fish farming industry is a likely threat.

Asplenium trichomanes L. (maidenhair spleenwort – strálhærdur trøllakampur) (Fig. 5). A species native to the Faroes, but very rare (Jóhansen 2000). Found only on one site on the southern part of Eysturoy. On 31 May 2020 17 living and four dead plants were observed here by D. J. and J.-K. J.

Asplenium scolopendrium L. (hart's-tongue – tungutrøllakampur). A species of unknown origin, but very rare. It has been found very far from any village, but has during the past ten years also been planted in Tórshavn. It was found on 30 Sept. 2007 in northwest Borðoy (Jensen et al. 2008, Jensen et al. 2009). Det. Benjamin Øllgaard (a half leaf is held in the herbarium at the National Museum of the Faroes). On 20 Sept. 2009, the plant was revisited and it then had five leaves, but only this single individual has been found in the wild.

Figure 4. *Asplenium adiantum-nigrum*, Eysturoy, 19 Aug. 2013. Photo: J.-K. J.

Figure 5. *Asplenium trichomanes*, Eysturoy, 20 July 2015. Photo: J.-K. J.

Thelypteris limbosperma (Bellardi ex All.) H.P.Fuchs (lemon-scented fern – dúnhærdur fjallakampur). A species native to the Faroes, but very rare. Only found at one site. Found 10 Aug. 2012 on Borðoy at 700 m a.s.l. (Jensen 2013, Jensen and Fosaa 2014). Det. Benjamin Øllgaard.

Athyrium distentifolium Tausch ex Opiz (alpine lady-fern – fjallakvennkampur). A species native to the Faroes, but very rare (Jóhansen 2000). It was first discovered in 1960–1961 at Depilsknúkur, Borðoy (Hansen 1966). On 12 Aug. 2012 it was refound with several hundred specimens at this same site. Det. Benjamin Øllgaard (Jensen et al. 2008, 2009). On 21 July 2013 a few specimens were found at another site at Viðvík, Viðoy. Det. J.-K. J.

Tofieldia pusilla (Michx.) Pers. (Scottish asphodel – bjarnarbroddur). A species native to the Faroes, but very rare. It is only known from one site north of Klaksvík, Borðoy. Two investigations in the area were unsuccessful, but on 10 Aug. 2012 the species was found in two valleys northeast of the previously known area. All three known sites are at approximately 400 m a.s.l. Det. D. J., A. P., J.-K. J. Leg. J.-K. J.

Elodea canadensis Michx. (American waterweed) (Fig. 6). A species not native to the Faroes. Recorded for the first time 9 Aug. 2021 in Tórshavn. Leg. R. áK. Det. Jens Christian Schou. Also found in Toftavatn, Eysturoy, 23 Aug. 2021. Leg. R. áK. Det. Jens Christian Schou and in Niðri á Vatni, Eiði, Eysturoy, 1 Sept. 2021. Leg. Sjúrður Hammer. Det. Jens Christian Schou.

Zostera marina L. (eelgrass – langt bendlatang). A species native to the Faroes, but possibly extinct. This species was found in the fjord in Vágur, Suðuroy in 1928 (Rasmussen 1970). It has been searched for several times, but the species is assumed to be extinct.

Potamogeton alpinus Balb. (alpine pondweed – fjallatjarnaks). A species native to the Faroes. This species was previously only known from Eiði, and was assumed lost due to the hydroelectric development, but it was rediscovered in Toftavatn, Eysturoy on 23 Aug. 2021. Leg. R. áK. Det. F. T.-L.

Figure 6. *Elodea canadensis*, Streymoy, 27 Aug. 2021. Photo: J.-K. J.

Ruppia maritima L. (beaked tasselweed – tráðmjátt havgras). A species native to the Faroes, but possibly exctinct. It was found near Hvalba, Suðuroy, around 1900 (Ostenfeld and Grøntved 1934), and Rasmussen (1970) found it in Vágsfjørður, Suðuroy. It has since been searched for several times, but is assumed to be extinct.

Dactylorhiza maculata subsp. *maculata* × *majalis* subsp. *purpurella*. It is native but very rare. Hybrids between the two subspecies were found on 11 July 1987 above the village of Mykines, on the Island of Mykines, along with both parent species which appeared numerous in both infield and outfields above the village. Photo and leg. F. T.-L. Det. F. T.-L., Jóhannes Jóhansen.

Dactylorhiza maculata subsp. *maculata* × *viridis* (L.) R.M.Bateman, Pridgeon and M.W.Chase (Fig. 7). It is native but very rare. Hybrids between the two species were first found on 22 July 1990 near Eiði, Eysturoy. Leg. Det. F. T.-L. The hybrid, of which two specimens of very different appearance were observed, was photographed. In addition, a single flower was taken from each of the two individuals. The occurrence was subsequently discussed with Jóhannes Jóhansen, Bernt Løjtnant and Kjeld Hansen, and subsequently approved. The author F. T.-L. keep this correspondence. The site was revisited at the end of June and in the middle of July (both in 2021), but in both cases unsuccessfully.

Figure 7. *Dactylorhiza maculata* subsp. maculata × viridis, Eysturoy, 22 July 1990. Photo: F. T.-L.

Orchis mascula L. (early-purple orchid – kalmansbørkubóndi) (Fig. 8). A species native to the Faroes, but very rare. Currently this species is only known from one site and is very vulnerable to grazing and fertilization. On 31 June 2020, D. J. counted a total of 45 plants. The sheep had bitten the inflorescences off three individuals and partially the leaves on many other orchid plants.

Juncus balticus Willd. (Baltic rush – sandsev). A species native to the Faroes. For the first time it was found outside of Sandoy on 14 Aug. 2021 in Fámjin, Suðuroy. Leg. B. L. Det. F. T.-L.

Juncus alpinoarticulatus subsp. *rariflorus* (Hartm.) Holub (northern green rush – ósasev) (Fig. 9). A species that is probably native to the Faroes. It has not been recorded previously, but must be considered as the most common *Juncus* species in the Faroes. The first record was made in Nes, Hvalba 18 Aug. 2018. Leg. D. J., J.-K.J. Det. F. T.-L. (Jensen 2020a,b). J.-K.J. collected it again in 2020 north of Nólsoy village, Kvívík, Klaksvík, Borðoy, Haraldssund, Kalsoy and Kunoy. Leg. J.-K. J., R. áK. Det. F. T.-L. It was

Figure 8. *Orchis mascula*, Eysturoy, 9 June 2009. Photo: J.-K. J.

Figure 9. *Juncus alpinoarticulatus* subsp. rariflorus, Nólsoy, 13 Aug. 2020. Photo: J.-K. J.

also found in Kirkja, Fugloy on 12 Aug. 2021 Leg. B. L. Det. F. T.-L. A collection excursion on Vágar on 9 Sept. 2020 with R. áK. found this species in every village and in many sites along the roads connecting the villages. Leg. J.-K. J. Det. F. T.-L.

Luzula multiflora subsp. *frigida* (Buchenau) V.I.Krecz. (common woodrush – margblømt ryski). A species native to the Faroes and very common, but not previously identified as this subspecies. The species has been found on Nólsoy, Sandoy and Vágar and they all belong to the northern subspecies *frigida* L. Leg. J.-K. J. Det. F. T.-L.

Carex oederi var. *oederi* (little green sedge). A species native to the Faroes, but its rarity is uncertain. Found near Kvívík, Streymoy on 29 Aug. 2020. Leg. J.-K. J. Det. F. T.-L. This species is probably not as rare as just the single discovery may suggest, but it may easily have been mistaken for *Carex demissa* Hornem., which is very common in the Faroes. Between 11 and 19 Aug. 2021 it was found in Kirkja, Fugloy, Eiði, Eysturoy and Hov, Suðuroy. Leg. B. L. Det. F. T.-L.

Schedonorus arundinaceus (Schreb.) Dumort. (tall fescue – strandarvingul). A species that is not native. Ostenfeld and Grøntved (1934) describe it under the synonym *Festuca elatior* and it is often found in cultivated areas. This species is found at several sites in Tórshavn (2020) and in some sites it appears invasive. Leg. D. J., J.-K. J. Det. Simon Lægaard.

Glyceria maxima (Hartm.) Holmb. (great manna grass – stórt mannagras). A species that is not native to the Faroes, and is rare. The only known site for this species is on Nólsoy, where Niels á Botni cultivated it in 1958 (Jógvan Thomsen pers. comm. 1975). Historically, it was found in a relatively large area, but during the past 15 years it has almost entirely disappeared. It is likely to disappear entirely if it has not already.

Arrhenatherum elatius (L.) P.Beauv. ex J.Presl and C.Presl (false oat-grass – rossahavri). A species that is not native to the Faroes. Ostenfeld and Grøntved (1934) report that it was cultivated. Still, it has grown for many years in Havnardalur, Streymoy (D. J. pers. comm. 2020) and both the subspecies *Arrhenatherum elatius* subsp. *elatius* and A. elatius subsp. bulbosum (Willd.) Schübl. and G.Martens were found there 28 Aug. 2020. Leg. D. J. Det. Simon Lægaard.

Caltha palustris subsp. *radicans* (T.F.Forst.) Syme (buttercup – mýrisólja). A subspecies native to the Faroes, but very rare. It was noted to exist in the Faroes in Jonsell and Karlsson (2001) with reference to Jóhansen and Fosaa, but has not been mentioned before or since in the literature. This subspecies was photographed 28 June 2009 on Hestoy. Leg. and photos M. G. Det. Jens Christian Schou. This is the only known specimen of this subspecies in the Faroes. It should be noted that *C. palustris* subsp. *palustris* is the national flower of the Faroes and is very common.

Ficaria verna Huds. (lesser celandine – kirkjubøsólja). A species that is not native, but which is not rare. The species spreads in the town of Nólsoy and Tórshavn. Jóhansen (2000) listed it as very rare, however, it was recently found in many gardens and also outside of gardens.

Tolmiea menziesii (Pursh) Torr. and A.Gray (pick-a-back-plant). A species that is not native. It is not used as a garden plant in the Faroes, however, discarded pot plant remains have established in infield areas on Vágar, Streymoy and Eysturoy. Photo and Det. R. áK. and D. J.

Darmera peltata (Torr.) Voss (Indian rhubarb). A non-native garden plant which is found in infield areas on Streymoy, Eysturoy and Borðoy. Spreads slowly by offshoots, but does not seem invasive. Obs., Det. and photos, R. áK. and D. J.

Lathyrus japonicus subsp. *maritimus* (L.) P.W.Ball (sea pea – strandarflatbjølgur) (Fig. 10). A native species which may have spread naturally from Iceland. However, it is very rare in the Faroes with only one known site. It was photographed on 1 Aug. 2014 on Vágar by M. G., but was not identified at the time. It was again photographed at the same site 14 June 2020 by Janus Hansen, and was determined by F. T.-L. Here it is only spreading via offshoots covering an area of only approx. 2 m^2.

Vicia sepium L. (bush vetch – garðakrøkja). A species that is not native (imported garden plant) and is very rare. It was found in Ørðavík, Suðuroy 14 Aug. 2021. Leg. B. L.

Figure 10. *Lathyrus japonicus* subsp. maritimus, Vágoy, 19 June 2020. Photo: J.-K. J.

Det. F. T.-L. This is the first discovery outside of Tórshavn, Streymoy.

Trifolium hybridum subsp. *hybridum* (alsike clover – skotasmæra). A species that is not native and very rare. It was found in Sørvágur and Sandavágur, Vágar on 9 Sept. 2020. Leg. R. áK., J.-K. J. Det. F. T.-L. It was originally discovered and identified on Streymoy by Ostenfeld and Grøntved (1934) and Rasmussen (1950), but was not mentioned in Jóhansen (2000). Ostenfeld and Grøntved (1934) suggested that it was likely unintentionally introduced or cultivated in the Faroes.

Dryas octopetala L. (mountain avens – fjallabrúður) (Fig. 11). A species native to the Faroes, but very rare (Jóhansen 2000). It is found near Múli, Borðoy 2007, and in Bláskorar, Kalsoy on 28 June 2014. It was also found as quite numerous near Eiði, Eysturoy in 2021, obs. F. T.-L.

Alchemilla mollis (Buser) Rothm. (garden lady's-mantle – garðaskøra) (Fig. 12). A species that is not native, but not rare. It has been a common garden plant and has been found to spread throughout most towns in the Faroes. Long (1940), in his review of garden plants in 1937, did not mention it. The first note of it outside of gardens were made by F. T.-L. in the northern part of Vatnsoyrar, Vágar on 23 July 1990 Obs. F. T.-L. In some areas it has spread outside of settlements, however it seems to be grazed by sheep. There has been some effort put on eradicating the taxon, in for example Tórshavn and Klaksvík, but attempts have been unsuccessful.

Urtica urens L. (annual nettle – brenninota). A species that is not native and is very rare. It was found in Sørvágur 9 Sept. 2020. Leg. R. áK. og J.-K. J. Det. J.-K. J. The species has been at this site for at least nine years (R. áK. pers. comm. 2020). Was also found in Fonsdalur above Vestmanna, Streymoy 11 Oct. 2021. Leg. Photo R. áK. Det J.-K. J. Rasmussen (1970) says it was imported unintentionally to Tórshavn with animal fodder.

Epilobium obscurum Schreb. (dwarf willowherb). A species that is not native and very rare. Discovered in Tórshavn in 2006. Leg. Mogens Thornberg. Det. Sven Snogerup.

Figure 11. *Dryas octopetala*, Eysturoy, 24 June 2012. Photo: M. G.

Figure 12. *Alchemilla mollis*, Streymoy, 22 Aug. 2010. Photo: M. G.

Epilobium komarovianum Lév. (creeping willowherb – kopardúnurt). A species that is not native, but has become very common. It was first discovered in Tórshavn, Streymoy in 2004. Leg. A. P. Det. Peter Wind, and secondly noted in Sørvágur, Vágar 2006. Leg. Mogens Thornberg. Det. Sven Snogerup. Since 2020 it has been is found throughout Tórshavn and Velbastaður, Streymoy, Sørvágur and in Bø, Vágar. Leg. R. áK., J.-K. J. It has also been found outside of human settlements such as in Eystnes and Rituvíksnes, Eysturoy. Leg. D. J., J.-K. J., R. áK. Det. F. T.-L. In 2021, the species was also found on Viðoy, Borðoy, Kalsoy, Eysturoy and Urðin in Nólsoy. On Viðoy it was found both at 5 and 400 m a.s.l.

Fuchsia L. (fuchsia). A genus that is not native to the Faroes, but nowadays not rare. There are several species of *Fuchsia* in the Faroes, but it is in particular *F. magellanica* Lam., which displays a notable spreading potential. It was imported as a popular garden plant and has over the last 20 years spread much with seed dispersal, especially so since 1999 when social wasps reached the Faroes (Hammer and Jensen 2019) and bumble bees arrived in 2007 (Jensen and Madsen 2018). *Fuchsia* can be seen along roads in many of the larger towns and recently also in gorges, along streams and steep cliffsides also far from human settlements.

Arabis alpina L. (alpine roch-cress – hvítur fjallakarsi). A species native to the Faroes, but very rare (Jóhansen 2000). It was for the first time found in Kunoy in 1821 (Trevelyan 1835), then it was found in 1974 on Borðoy (Jóhansen 1977). It was again found on Kunoy in 2007, assumingly on the same site as in 1821 (A. P. pers. comm. 2010). The fourth find was on Viðoy 21 July 2013. Photo and leg. D. J. and J.-K. J. Det. M. G.

Reynoutria japonica Houtt. (Japanese knotweed). A species that is not native, but not rare. The species seems to spread on Streymoy. Obs. J.-K. J. In 2020 it has further been found in Sandavágur, Fuglafjørður, Skipanes, Elduvík, Kvívík, Øravík. Obs. R. áK. In his review of garden plants from 1937, Long (1940) does not mention this species in the Faroes.

Drosera rotundifolia L. (round-leaved sundew – rundblaðað sóldøgg) (Fig. 13). A species native to the Faroes, but

Figure 13. *Drosera rotundifolia*, Nólsoy, 11 July 2014. Photo: J.-K. J.

very rare. First found on Sandoy and Suðuroy (Ostenfeld and Grøntved 1934). More recently also found on Nólsoy 31 July 2012. Leg. J.-K. J. and D. J., and in 2019 Hoyvik, Streymoy. Obs. Jan Anderson. The larger population on Sandoy is in good condition, but on Suðuroy it is less numerous.

Lysimachia tenella L. (bog pimpernel – neyðarnartl) (Fig. 14). A species native to the Faroes, but very rare. It has been found by Fjallavatn, Eysturoy, Leitisvatn, Vágar and in Tvøroyri, Suðuroy (Jóhansen 2000). Most of the plants near Toftavatn have recently been heavily grazed by greylag geese (*Anser anser* L.). A large area covered by this species was discovered on Kalsoy with hundreds of individuals in 28 Aug. 2014. Obs. Eskild Hansen. Leg. J.-K. J. Det. M. G.

Kalmia procumbens (L.) Galasso, Banfi and F.Conti (alpine azalea – seyðamergur) (Fig. 15). A species native to the Faroes, but very rare (Jóhansen 2000). The first discovery outside of Streymoy and the northern isles was in Vágur, Suðuroy on 14 Aug. 2021. Leg. B. L. Det. F. T.-L. Over a hundred individuals were observed on Viðoy between Hvannasund and Viðareiði 7 Aug. 2021. Leg. D. J. Det. J.-K. J.

Gentianella campestris (L.) Börner (field gentian – Íslendskt loppugras). A species native to the Faroes. The species is not rare, but the occurrence of *G. campestris* subsp. *baltica* is uncertain. *Gentianella campestris* subsp. *campestris* f. *alba* is very rare. Both *Gentianella campestris* s.l. and *Gentianella campestris* subsp. *baltica* (Murb.) Tutin have been found Leg. B. L. Det. F. T.-L. *Gentianella campestris* subsp. *campestris* f. *alba* has not been recorded previously, but a small population was discovered in Hvalvík, Streymoy on 20 Aug. 2014 and was observed the following years on the same site. Leg. J.-K. J. Det. F. T.-L.

Figure 15. *Kalmia procumbens*, Streymoy, 30 May 2010. Photo: M. G.

Mertensia maritima (L.) Gray (oysterleaf – sævarrossatunga) (Fig. 16). A species that is native, but very rare. Since Jóhansen (2000), it has disappeared from the known sites on Streymoy, Vágar and Suðuroy. It is now only known to survive at a few sites on Sandoy, and as 12 individuals in Borðoy and 14 on Eysturoy (2020).

Plantago major L. (greater plantain – stórvaksin gøtubrá). A species that is not native, and is rare. It has been found on Svínoy, Borðoy, Eysturoy, Streymoy, Vágar, Suðuroy. Leg. R.-á K., D. J. and J.-K. J. Det. F. T.-L. Both *P. major* subsp. *major* and *P. major* subsp. *intermedia* (Gilib.) Lange are found.

Mimulus/Erythranthe spp. (monkeyflower – laurusa blomstur/blettut apublóma). Thus genus is not native, but is not rare. There are likely two or more species present, but *M. guttatus* DC. is the most widespread and common.

Figure 14. *Lysimachia tenella*, Kalsoy, 2 Aug. 2016. Photo: M. G.

Figure 16. *Mertensia maritima*, Streymoy, 30 July 2007. Photo: M. G.

The plants of this genus was brought to Rituvík, Eysturoy from Bakkafjørðinum, Iceland by Laura Einarsson in 1926 (Pers. Comm. Hanna Einarsson Nielsen 2020). Long (1940) reported this taxon as found in two variants in 1937. Now the genus is widespread in the Faroes.

Euphrasia stricta var. *stricta* (drug eyebright) (Fig. 17). A species native to the Faroes and not rare. It was found in Miðvágur, Vágar 9 Sept. 2020. Leg. R. áK., J.-K. J. Det. F. T.-L. It was also found widespread on Sandoy and Suðuroy in August 2021, although it had a very varying appearance there. Leg. B. L. Det. F. T.-L.

Euphrasia nemorosa (Pers.) Wallr. (common eyebright). A species native to the Faroes, but likely mistaken for other species. First discovered in Kirkja, Fugloy on 12 Aug. 2021. Leg. B. L. Det. F. T.-L.

Utricularia stygia G.Thor (northern bladderwort – trølsk bløðrurót). A species native to the Faroes, but recorded for the first time in a little pond on Sandoy on 31 July 2014. Leg. J.-K. J., D. J., M. G. Det. Jens Christian Schou.

Utricularia vulgaris agg. (bladderwort – bløðrurót). A species aggregate native to the Faroes, but never seen in bloom so specific identification has not been possible. Historically, this taxon was only known from two sites in Hoyvík, Streymoy and Vágar, but due to infrastructure development the small pond in Hoyvík was destroyed. Rasmussen (1970) mentioned that it has been found in Miðvágur, Vágar, and it has recently been found in nine different ponds on Vágar 2021. Leg. R. áK. Det. Jens Christian Schou.

Campanula rotundifolia subsp. *rotundifolia* (harebell – bláklokka). A subspecies native to the Faroes, but very rare. It appears to have disappeared from Streymoy. One of the two remaining populations on Eysturoy is doing well, while the other has become almost completely lost due to cultivation and other human disturbance.

Campanula rotundifolia subsp. *gieseckiana* (Vest) Witasek (harebell – bláklokka) (Fig. 18). A subspecies native to the Faroes. It has a healthy population on Eysturoy. Leg. J.-K. J., Det. F. T.-L. A small population (10–15 flowers) by Trøllanes, Kalsoy (photo). Leg. J.-K. J., Jógvan Joensen.

Figure 17. *Euphrasia stricta* var. stricta, Sandoy, 9 Aug. 2021. Photo: M. G.

Figure 18. *Campanula rotundifolia* subsp. gieseckiana, Eysturoy, 12 Aug. 2015. Photo: J.-K. J.

Det. F. T.-L. Three flowers were found by Viðareiði, Viðoy at 600 m a.s.l. Det. F. T.-L. Photo: Kartni Ravnsfjall, Sigrid Bjartalíð, Óluva Zachariassen. This subspecies is assumingly also reported from Borðoy and Hestoy by Rasmussen (1950).

Anthemis sp. (chamomile). A genus not native, and rare. Observed along the road in Trongisvágur, Suðuroy 13 Aug. 2021 where it had been sown in connection to road development. Leg. D. J. Det. F. T.-L.

Artemisia vulgaris var. *vulgaris* (common mugwort). A species that is not native, but 20 individuals were found in Vestmanna, Streymoy 16 August 2020. Leg. J.-K. J. Det. F. T.-L. Five individuals were found in Sørvágur, Vágar 16 August 2020 Leg. R. áK. One individual found on Svínoy 15 Aug. 2020 (photo: Sunnva Asano). One individual was also found on Sandur, Sandoy 14 July 2020 Leg. J.-K. J., but it has been observed here for at least 8–10 years (pers.comm. Hanna Joensen 2020).

Jacobaea vulgaris Gaertn. (common ragwort – eingjardanadái). A species that is not native, but has been imported in mixed seed packs which are used along roads and public areas. The species is now found at a couple of sites throughout the Faroes, but they typically get removed as soon as they are found.

Tussilago farfara L. (coltsfoot – loðið hóvblað). A native taxon today found throughout the Faroes. Ostenfeld and Grøntved (1934) reported that it could be found in the outfield, but Rasmussen (1970) writes that in 1952 the species was not common. Over the past two or three decades it has apparently had better conditions to spread, and is in some parts spreading notably near towns and close to development areas, in slopes, gorges and along roads. The species tends to spread with soil supplied by local municipalities.

Petasites japonicus (Siebold and Zucc.) Maxim (giant butterbur – Japanskt hóvblað) (Fig. 19). A species that is not native, and rare. It is found in a small area of infield area in Fuglafjørður, Eysturoy 9 Aug. 2019 Leg. Photo R. áK. Det. F. T.-L. and Nólsoy 19 Aug. 2021 Leg. R. áK. Det. F. T.-L. At both sites it has been known for at least 60 years.

Figure 19. *Petasites japonicus*, Nólsoy, 26 Aug. 2021. Photo: J.-K. J.

Saussurea alpina (L.) DC (common saw-wort – loðin fjallatistil). A species that is probably native, but very rare. It was first found in August 1999 as a small population by Vestmanna, Streymoy (Fossá et al. 1999). Found again on 16 July 2018 as three populations with several 100's of individuals. Leg. J.-K. J., D. J.

Silybum marianum (L.) Gaertn. (milk thistle – mariutistil). A species that is not native, but likely imported with animal fodder. It has been found at several sites in Tórshavn and once in Suðuroy in 2020. Leg. photo: Turid Vestergaard. Det. D. J.

Cirsium vulgare (Savi) Ten. (bull thistle). A species that is not native, but probably imported with seed mixtures used along roadsides. Found for the first time in Tórshavn, Streymoy in 2008 (1–4 specimens). The taxon does not appear to spread as it was still only found on the same site in 2020.

Cirsium heterophyllum (L.) Hill (melancholy thistle) (Fig. 20). A species that is not native, but probably imported with seed mixtures used along roadsides. Found in 2005 in Tórshavn but it disappeared from there again. However, offshoots were planted and cultivated in Havnadalur where they still are found, but they do not appear to produce seeds (2020). Leg. D. J. Det. F. T.-L.

Figure 20. *Cirsium heterophyllum*, Streymoy, 21 July 2016. Photo: J.-K. J.

Sonchus asper (L.) Hill (prickly sow-thistle). A species that is not native. It is typically seen in human settlement areas associated with animal husbandry, such as at Havnadalur (28 Aug. 2018), Tórshavn (19 July 2020), Trongisvágur, Suðuroy (20 July 2020).

Pilosella aurantiaca subsp. *aurantiaca* (orange hawk bit – gulreyð smyrilsurt). A species that is not native, but not rare. It is assumed to have been introduced as seed and is seen in several developed infield areas (pers. comm. D. J. 2020).

Peucedanum ostruthium (L.) W.D.J.Koch (masterwort). A species that is not native and may have been brought as a medicinal plant long ago. It is also very rare in the Faroes. One individual was found in Trongisvágur, Suðuroy 14 Aug. 2021. Leg. B. L. This taxon could easily be mistaken for *Angelica archangelica* L., which is very common.

Heracleum sphondylium subsp. *sphondylium* (common hogweed). A species that is is not native and very rare. It is a garden taxon which was found in infield areas on Eysturoy 2020. Leg. Búgvi Róin. Det. Per Hartvig. A large population of this taxon has been known in Runavík municipality, but it is now almost eradicated.

Discussion and conclusion

In total, 64 species or subspecies or varieties of vascular plants are described in the list (Table 1). Of these, 45 taxa are found infield, 36 are found outfield, and 17 are found in both infield and outfield. Nine of the taxa have been found above 250 m a.s.l. 35 taxa are new species or subspecies not previously recorded from the Faroes. Six taxa have previously been reported as present in the Faroes but have for unknown reasons been omitted from the most recent list by Jóhansen (2000). 15 taxa in the list have been categorized as showing 'spreading potential'; this signifies that they are found outside of a site where they have been intentionally cultivated. 50 taxa are rated as 'rare species', however for five of these the status is uncertain, while two are assumed to be extinct, and one was assumed extinct and has been found again – a socalled Lazarus species.

Infield, outfield, above 250 m a.s.l.

The purpose of the categorizations given in Table 1 is to aid the evaluation of potential conservation threats, or which taxa themselves are potentially invasive species. While the border between infield and outfield is not formally defined in Faroese legislation, in general terms most of the larger towns and villages (infield) in the Faroes don't have extensive grazing of either sheep or hares, while most small villages will have sheep grazing during the winter period, and hares are known to move into towns during periods of snowcover.

The main conservation threat to taxa found infield in the Faroes is without doubt poorly planned exploitations, e.g. for roads, housing and increasing demand for industrial harbours. A small pond in Hoyvík, Streymoy, which was the only known site of *Utricularia vulgaris/australis* on Streymoy,

Table 1. List of vascular plants found in the Faroes, and in which part where they were found: x – implies, '(x)' is used where it is uncertain, '-' assumed extinct, L – Lazarus species.

			Found:			New species or subsp.	Missed in recent literature	Spreading-potential	Rare species
	Dyntaxa ref:	Name	Infield	Outfield	> 250 m a.s.l.				
1	48424	*Lycopodium annotinum*		x	x				x
2	29732	*Equisetum hyemale*	x	x					x
3	29738	*Equisetum variegatum*		x					x
4	17854	*Asplenium adiantum-nigrum*		x					x
5	57311	*Asplenium trichomanes*		x					x
6	57309	*Asplenium scolopendrium*		x		x			x
7	28770	*Thelypteris limbosperma*		x	x	x			x
8	12767	*Athyrium distentifolium*		x	x				x
9	48410	*Tofieldia pusilla*		x	x				x
10	12674	*Elodea canadensis*	x	x		x		x	
11	12748	*Zostera marina*	x						-
12	12715	*Potamogeton alpinus*		x			L		x
13	12736	*Ruppia maritima*	x						-
14	98851/87053	*Dactylorhiza majalis* subsp. *purpurella* × *D. maculata* subsp. *maculata*		x		x			x
15	87053/17883	*Dactylorhiza maculata* subsp. *maculata* × *viridis*	x			x			x
16	17952	*Orchis mascula*		x					x
17	87546	*Juncus balticus*	x						x
18	93716	*Juncus alpinoarticulatus* subsp. *rariflorus*	x	x		x			
19	93339	*Luzula multiflora* subsp. *frigida*	x	x	x	x			
20	28991	*Carex oederi* var. *oederi*		x		x			
21	32660	*Schedonorus arundinaceus*	x				x	x	
22	48970	*Glyceria maxima*		x					x
23	48705	*Arrhenatherum elatius*	x				x		
24	93373	*Caltha palustris* subsp. *radicans*		x		x	x		x
25	32829	*Ficaria verna*	x					x	
26	302596	*Tolmiea menziesii*	x			x		x	x
27	48499	*Darmera peltata*	x			x			x
28	93085	*Lathyrus japonicus* subsp. *maritimus*	x			x			x
29	35645	*Vicia sepium*	x						x
30	93101	*Trifolium hybridum* subsp. *hybridum*	x				x		x
31	17756	*Dryas octopetala*		x	x				x
32	63308	*Alchemilla mollis*	x			x		x	
33	63613	*Urtica urens*	x	x			x		x
34	48554	*Epilobium obscurum*	x			x			x
35	48549	*Epilobium komarovianum*	x	x		x		x	
36	125700	*Fuchsia* sp.	x	x		x		x	
37	24962	*Arabis alpina* L.		x					x
38	104135	*Reynoutria japonica*	x			x		x	
39	29445	*Drosera rotundifolia*	x	x					(x)
40	56315	*Lysimachia tenella*	x	x					x
41	39567	*Kalmia procumbens*	x	x	x				x
42	99058/99057	*Gentianella campestris* subsp. *campestris* and subsp. *baltica*	x	x		x			x
43	48467	*Mertensia maritima*	x						x
44	93161/93160	*Plantago major* subsp. *major* and subsp. *intermediata*	x			x			
45	119258	*Mimulus/Erythrante* complex	x	x				x	
46	83091	*Euphrasia stricta* var. *stricta*	x			x			(x)
47	40856	*Euphrasia nemorosa*	x			x			(x)
48	48334	*Utricularia stygia*		x		x			x
49	324754	*Utricularia vulgaris* agg.	x	x					x
50	87073	*Campanula rotundifolia* subsp. *rotundifolia*	x	x					x
51	87071	*Campanula rotundifolia* subsp. *gieseckiana*		x	x	x			(x)
52	118804	*Anthemis* sp.	x	x		x			x
53	76247	*Artemisia vulgaris* var. *vulgaris*	x			x		x	x

(*Continued*)

Table 1. Continued.

	Dyntaxa ref:	Name	Found: Infield	Outfield	> 250 m a.s.l.	New species or subsp.	Missed in recent literature	Spreading-potential	Rare species
54	45007	*Jacobaea vulgaris*	x	(x)		x		x	
55	24939	*Tussilago farfara*	x	x				x	
56	18353	*Petasites japonicus*	x			x		x	x
57	18382	*Saussurea alpina*		x	x	x			x
58	24866	*Silybum marianum*	x			x			x
59	18176	*Cirsium vulgare*	x			x			x
60	82486	*Cirsium heterophyllum*	x			x			x
61	24876	*Sonchus asper*	x			x			x
62	87099	*Pilosella aurantiaca* subsp. *aurantiaca*	x			x		x	
63	17789	*Peucedanum ostruthium*	x			x			x
64	87040	*Heracleum sphondylium* subsp. *sphondylium*	x			x		x	x

was destroyed for housing development in the mid-2000s. However, the species was recently rediscovered in several ponds on Vágar. Land development is not only a threat for infield plantlife. In relation to the development of the hydroelectric facility south of Eiði, Eysturoy, *Potamogeton alpinus* subsp. *alpinus* was lost from the old site by Eiðisvatn, and it was assumed entirely extinct from the Faroes until it was rediscovered in 2021 in Toftavatn.

Fertilization is primarily undertaken where there exist suitable roads, and is limited to below 250 m a.s.l., although dispensation can be given from this legal restriction. The listed taxa which are found outfield, and which are most threatened by fertilization are *Equisetum hyemale* (Fig. 3), *Asplenium adiantum-nigrum* (Fig. 4) and *Asplenium trichomanes* (Fig. 5).

New species

There has not been a systematic survey done in the Faroes since Hansen (1966). Therefore, the new species and subspecies included in our list are more or less sporadically collected, and if such a systematic survey (even if just literature-based) was to be undertaken many more taxa would be discovered or rediscovered. Another indication of the limited knowledge about plant life in the Faroes is that an individual short-term botanical excursion such that by as Lambertsen and Thorning-Lund (2021) found no less than three new taxa for the Faroes. Some species can be assumed to have been in the Faroes for a long time as they are found widely, such as *Juncus alpinoarticulatus* subsp. rariflorus but have simply not been previously identified or described or mistaken for another. *Carex oederi* var. *oederi* is another newly identified taxon which has probably been mistaken for *Carex demissa* which is very common in the Faroes.

There are a few examples of taxa which have been mentioned in historical literature, and yet not in the most recent publication by Jóhansen (2000). An example is *Arrhenatherum elatius* which was listed in Ostenfeld and Grøntved (1934) and was given a Faroese name in Rasmussen (1970). While a complete review of historic literature was beyond the scope of the current publication, this would clearly be a worthwhile and fruitful enterprise for future researchers.

Spreading potential

There have not been undertaken any studies or systematic surveys of introduced or invasive taxa in the Faroes. It is, however, becoming clear that some introduced plants have a capacity to spread outside of the areas where they have been cultivated. Many such taxa end up harming the native flora and become designated invasive species. For example, two well-known invasive plants which are now also found in the Faroes are *Reynoutria japonica* and *Elodea canadensis,* and two less infamous plants which spread noticably in the Faroes are *Fuchsia* sp. and *Tussilago farfara*. All these plants which show some spreading potential should be thoroughly reviewed to estimate their potential invasiveness.

Rare species

Many of the taxa in this list are rare, and by this are at risk of becoming extinct. The redlist (Fosaa et al. 2005) should be revised to include some of these species. For rare species there are different levels and qualities of threats, however, grazing by sheep and hare must be assumed to be a major threat to rare taxa in the Faroes (Haraldsstovu 2020). For example, *Orchis mascula* showed signs of being grazed (most likely by sheep). Grazing by hares is also a potential but understudied threat to for example *Juniperus communis*. Some rare taxa such as *Campanula rotundifolia* and *Orchis mascula* are threatened by removal by collectors. Some of the rare coastal taxa such as *Mertensia maritima* and *Lathyrus japonicus* subsp. *maritimus* are threatened by land development and by weather and climate change, and *Campanula rotundifolia* subsp. *gieseckiana*, which is only found at relative high altitude (> 300 m a.s.l.), will also be threatened by an increasingly warming climate. Some of the rare taxa may have been introduced and their risk of extinction is therefore less consequential than that of rare native plants.

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Author contributions

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Data availability statement

This article has no additional data.

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