# *Juncus ranarius* Songeon & E.P. Perrier (Frog Rush)

Draft account

vc 16, apparently gone from vc15

## Rarity / scarcity status

Frog Rush is a plant of damp brackish coastal habitats, typically on mud- and sand-flats above the high-water mark, and is widely scattered in the British Isles, extending to inland salted roadsides in recent years. Its conservation risk status is considered to be one of 'Least Concern'. It was not generally recognized in the British Isles as a species separate from *Juncus bufonius* (Toad Rush) until 1978[1] and was not found as a plant currently growing in the county after then until 2019. It is very **rare** in Kent, with only one known location.

## Account

Philp (2010) refers to the species (under *Juncus ambiguus*) as last recorded in Kent in 1862, from Deal. This was apparently found by James Boswell Syme. There was, however, a later record represented by a specimen gathered in 1947 at Sandwich Bay, now at the National Museum Wales as part of collection donated by Barbara Welch and presumably a find of hers. Both Deal and Sandwich have much suitable terrain for this species and it is possible that it could be re-found there, overlooked as *Juncus bufonius.*

Crossness.
Photos by
Rodney Burton, 7 August 2019

Frog Rush was assumed to be 'probably extinct' in the county until its discovery by Rodney Burton and Juliet Cairns on 7 August 2019[2] at the Crossness Nature Reserve (sample grid reference, TQ 4939 8048). Many patches were found in a horse-grazed enclosure (West Paddock), at the edge of muddy depressions which are often water-filled, groundwater levels being usually governed by the operation of a wind pump. Associated plants included *Rorippa palustris* (Marsh Yellow-cress), dwarfed *Veronica anagallis-aquatica* (Blue Water-speedwell) and *Spergularia marina* (Lesser Sea-spurrey); *Plantago major* subsp. *intermedia* was also plentiful all around. The last two plants are particularly indicative of salinity, the tidal Thames being some 300m away. The presence of a small amount of *Puccinellia fasciculata* (Borrer's Saltmarsh-grass) at the site is similarly indicative. There are brackish dikes around the enclosure(s) here and the ground is shown as open at least back to ordnance survey maps of the

[1] Cope, T.A. & Stace, C.A. (1978) The *Juncus bufonius* L. aggregate in western Europe. *Watsonia* 12: 113-128.

[2] The species narrowly escaped earlier discovery, since a 2013 find at the site was taken to be *J. bufonius* and a specimen gathered in 2018 was mislaid before identification.

1870s. Eighteenth century maps show parcel layouts of varying consistency with the subsequent pattern, but the present site can be inferred to be a survivor of long-term open grazing marshes. It is of course not necessary to assume long-term continuity of the species here in view of the possibility of transmission by birds.

The Frog Rush at Crossness appears to have a distinct relationship with the ground kept open by changing water levels, with colonization following the edges of slightly higher ground, where there is still the opportunity of bare soil for germination (the species being an annual), but not penetrating far into more permanent vegetation. Openness is maintained, not just by the limitations which the habitat places on the establishment of perennials, but also by the cracking of the mud in drying out, and by horse-trampling. The Frog Rush sometimes grows as distinct tufts on the broken dried mud surface and sometimes as a patch comprising a dense mat or sward, occasionally as an understorey to sprawling plants of *Spergularia marina*. The dense sward, illustrated in one of the accompanying photos, may be a product of seeding from individual tufts the previous year, which has found open ground not subsequently broken up. The plants in such a patch are small, atypically one-stemmed and more or less erect, with relatively few flowers and hence reduced seed production per plant; however, there must be hundreds in any one such patch.

Tufted growth, Crossness. Photo by Rodney Burton, 7 August 2019

Frog Rush seeds apparently germinate most effectively after dormancy is broken by cold, indicating spring germination. Exposure to light (e.g. in disturbed open terrain) also encourages germination, which is compatible with saline conditions and, although an increase of salinity beyond a certain concentration results in a lowered germination rate, ungerminated seeds have been found to be undamaged by the increased salinity. Higher salinity is more likely to obtain in summer, after evaporation, so germination compatibility with modest salinity again points to spring germination.[3]

Any apparent *J. bufonius* in a saline habitat should be considered for potential identification as *J. ranarius*, although the differences are not straightforward, as the *J. bufonius* aggregate as a whole is very variable, demonstrating considerable plasticity in many of its characters[4]. *J. ranarius* may have shorter stems (i.e. not exceeding 17cm), but most *J. bufonius* does not exceed this anyway. *J. ranarius* flowers bunch together, usually 2-3 together at the tip of an ultimate branch; *J. bufonius* flowers tend to be more spaced out, although small plants may be congested. The *J. ranarius* capsule is usually blunt, as long as, or longer than the inner tepals; the *J. bufonius* capsule is generally somewhat pointed (subacute) and as long as, or shorter than the inner tepals (so length does not help where inner tepals and capsules are equivalent). The inner tepals of *J. ranarius* are blunt, often emarginate with a mucronate tip; those of *J. bufonius* are more or less acute. The determination of Crossness material by Tom Cope was based on 'the blunt inner tepal, blunt capsule (perhaps a little too short) and dumpy barrel-shaped seeds'.

This account has benefited greatly from the involvement of Rodney Burton.

[3] Kolodziejek, J. & Patykowski, J. (2015). Germination and Dormancy in Annual Halophyte *Juncus ranarius* Song & Perr. *Notulae Botanicae Horti Agrobotanici Cluj-Napoca*, **43(2):** 439-446.

[4] Cope, T.A. & Stace, C.A. (1983). Variation in the *Juncus bufonius* L. aggregate in western Europe. *Watsonia* **14**: 263-272.