

# Introduction to Duckweeds



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# Old Lemnaceae : 4 genera (now in Araceae)

***Spirodela*** (3 spp)  
(including ***Landoltia***)

***Spirodela polyrhiza***  
***Spirodela punctata***

7-10 roots  
2-5 roots

***Lemna*** (14 spp)

***Lemna gibba***

1 root

***Lemna minor***

1 root

***Lemna turionifera***

1 root

***Lemna trisulca***

1 root

***Lemna minuta***

1 root

***Lemna valdiviana***

1 root

***Lemna aequinoctialis***

1 root

***Wolffiella*** (10 spp)

No roots

***Wolffia*** (11 spp)

***Wolffia arrhiza***

No roots

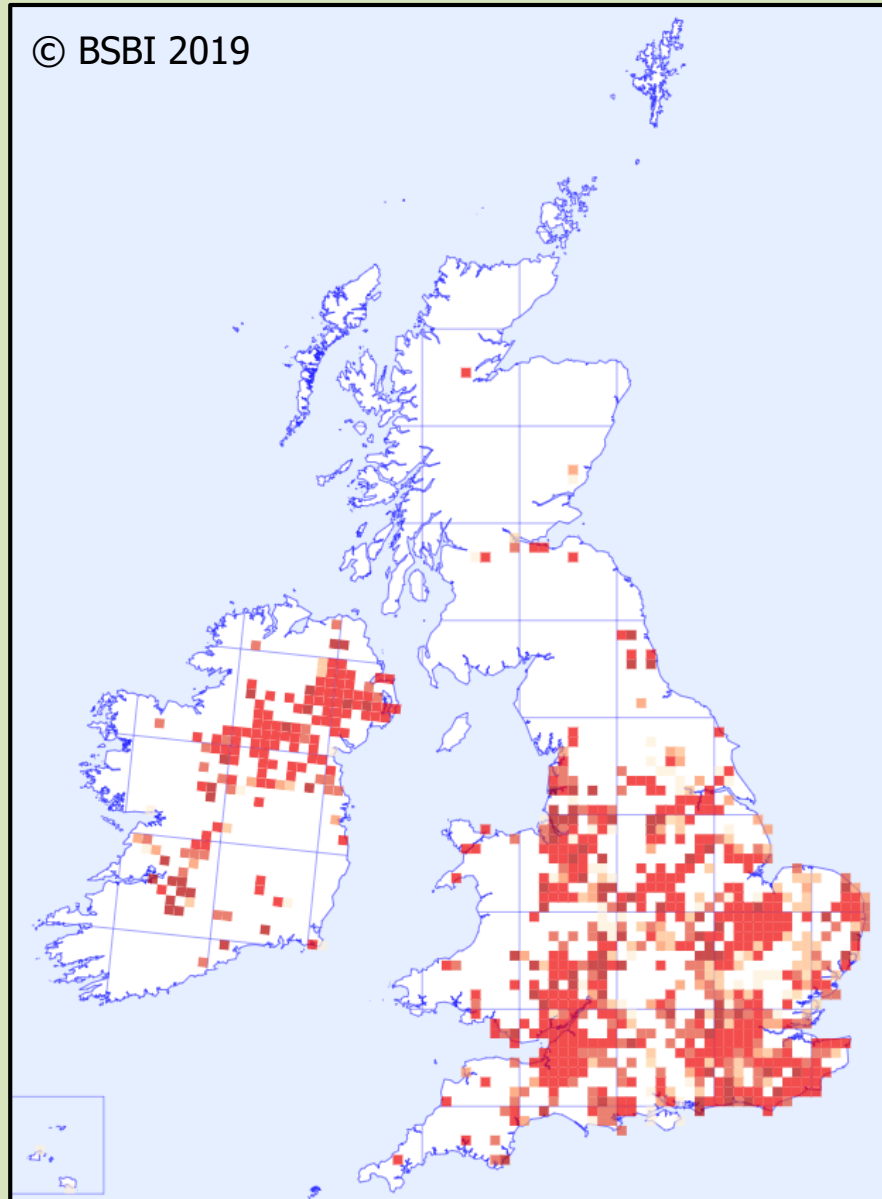
# *Spirodela polyrhiza* (Greater Duckweed)



- Large fronds
- Red underside
- Many roots (5+)  
(but they get eaten)
- Turns red in  
autumn
- Multiple veins



# *Spirodela polyrhiza* (Greater Duckweed)



## Distribution in Britain & Ireland

(taken from the BSBI DDb  
Oct 2019)

Ponds  
Canals  
Rivers  
Ditches

(Base-rich water)

Tolerant of some eutrophication



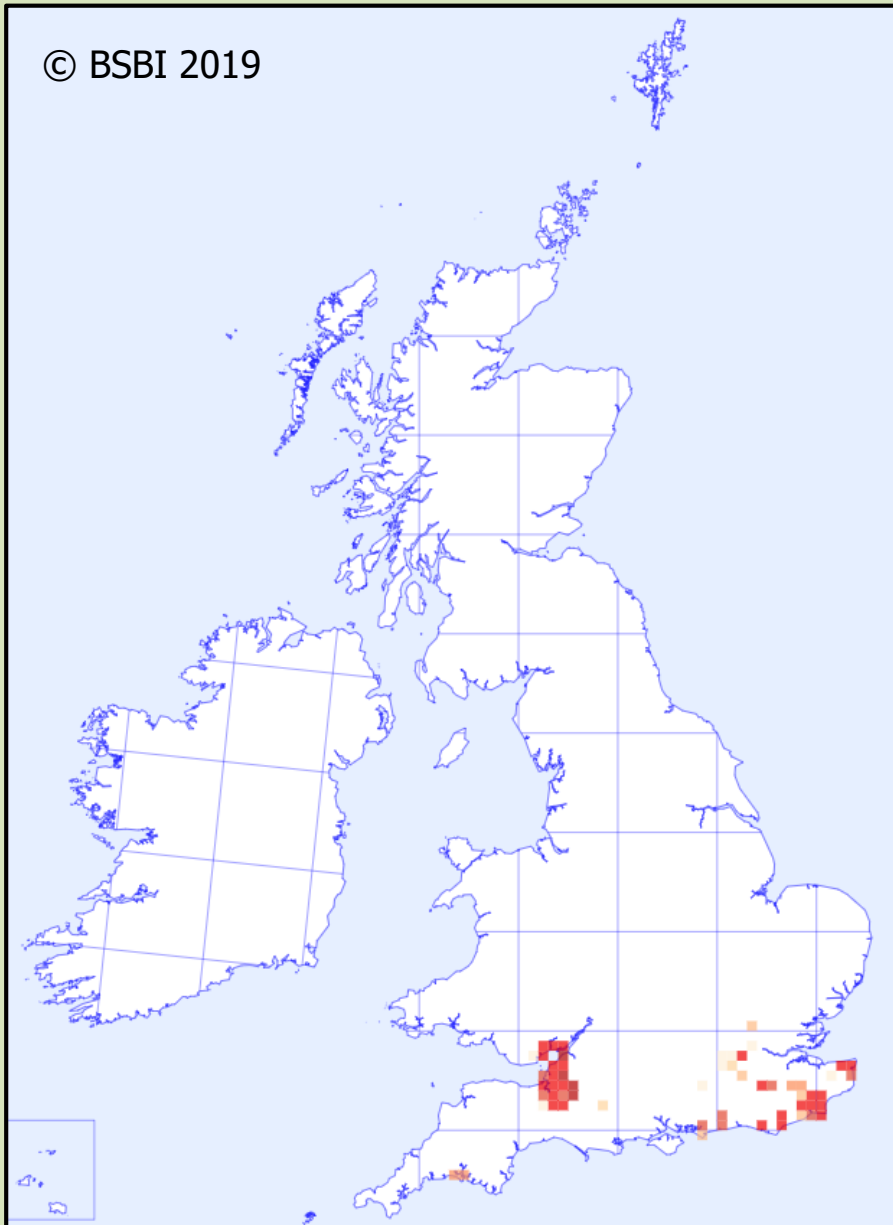
# ***Wolffia arrhiza*** (Rootless Duckweed)



- Small globose-ovoid fronds
- Bright green
- No roots
- Reproduces by budding



# *Wolffia arrhiza* (Rootless Duckweed)



## Distribution in Britain & Ireland

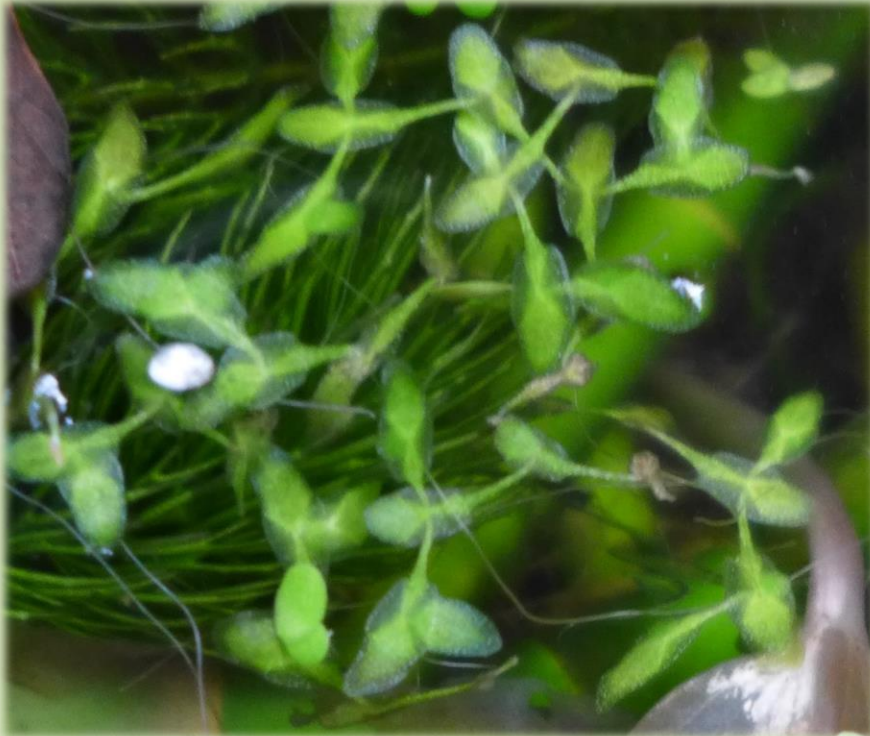
(taken from the BSBI DDb  
Oct 2019)

Ditches  
Ponds

Base-rich water

GB: Vulnerable  
England: Least Concern  
Wales: Least Concern  
GB Scarce

# ***Lemna trisulca*** (Ivy-leaved Duckweed)

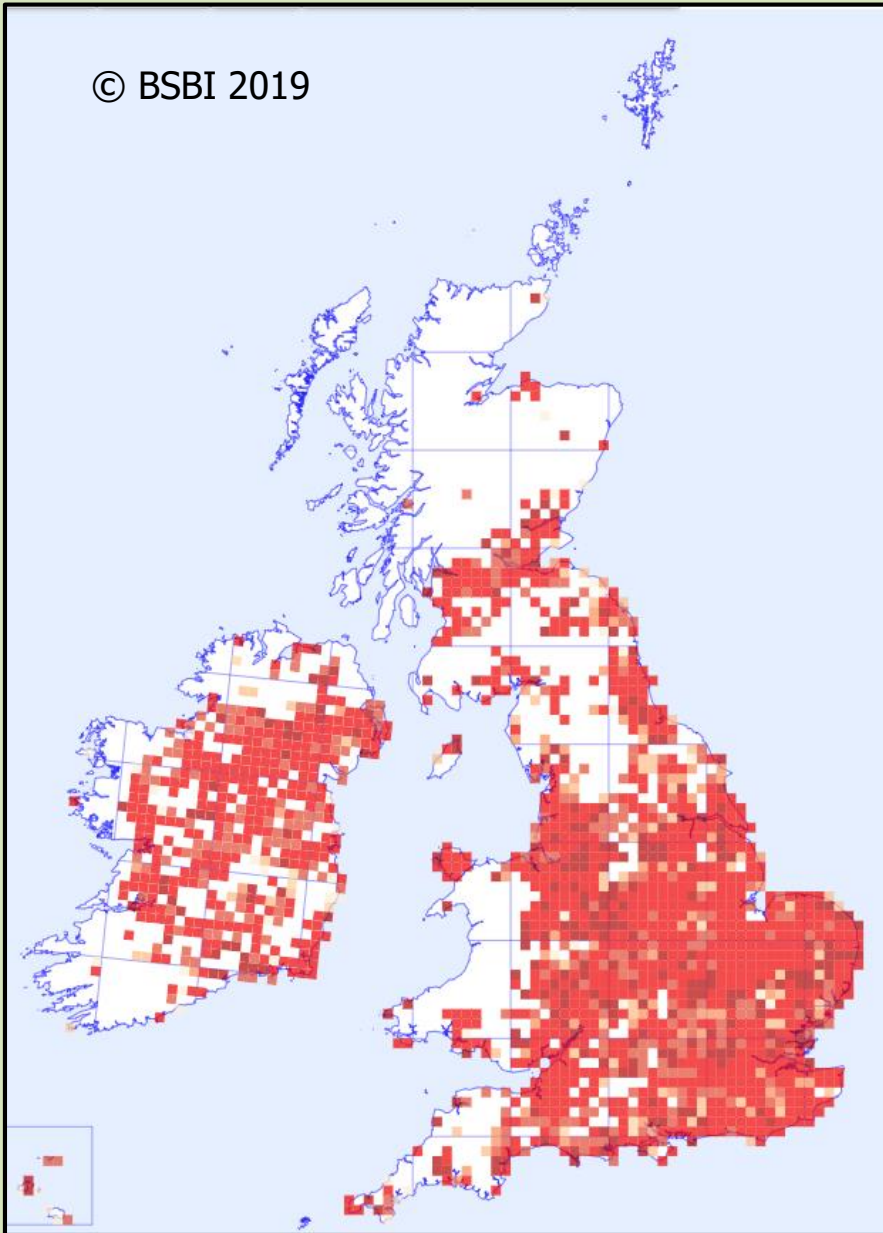


- Stalked fronds form branching chains
- Submerged, just below water surface
- Flowering fronds float on the water surface



# *Lemna trisulca* (Ivy-leaved Duckweed)

© BSBI 2019



## Distribution in Britain & Ireland

(taken from the BSBI DDb  
Oct 2019)

Rivers  
Canals  
Streams  
Ditches  
Lakes  
Ponds

Mesotrophic to eutrophic water



# The Troublesome Ones

- All that is MINUTE is not *minuta*
- Fat Duckweed is not always FAT
- Common Duckweed may not be the most COMMON
- RED is not always RED Duckweed

# Frond shape



Photo: © R.V. Lansdown

***Lemna minor***

Ovate, widest near middle

Length:width ratio 1.2-2.0

***Lemna gibba***

Rounder, widest near apex

Length:width ratio 1.0-1.5

# Enlarged Cells



## *Lemna gibba*

Reticulum on upper surface

Large air cells visible

Swollen cells underneath →

## *Lemna minor*

Upper surface uniform

No large air cells



Photo:  
© Fred Giles



# Red Coloration



**Red Duckweed**  
***L. turionifera***

Coloration begins  
at the node

Photo:   
© Stefan Lefnaer





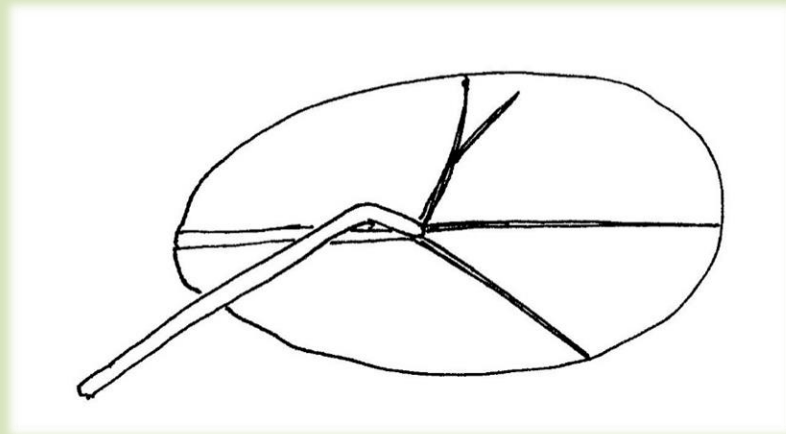
# Pappules



- *L. turionifera* has bumps along the frond. **Note red coloration around big bump at node**
- *L. minor* can have pappules too, but no red coloration



# ***Lemna minor*** (Common Duckweed)

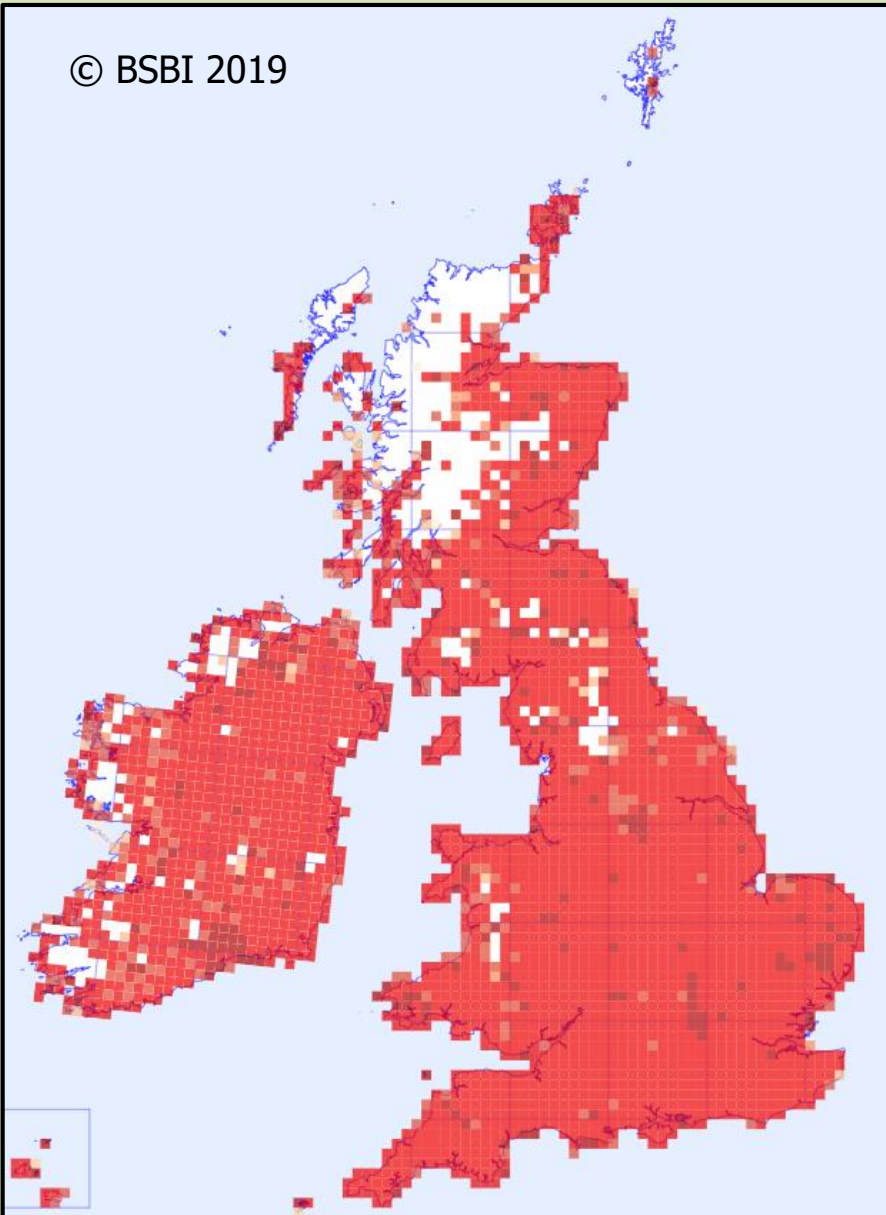


- Ovate, widest near middle
- Length:width ratio 1.2-2.0
- No red pigmentation
- Upper surface uniform, without large air cells
- 3 or more veins, one primary, two secondary and tertiary veins arising from secondary veins



# *Lemna minor* (Common Duckweed)

© BSBI 2019



## Distribution in Britain & Ireland

(taken from the BSBI DDb  
Oct 2019)

Ponds  
Lakes  
Ditches  
Runnels

# ***Lemna turionifera*** (Red Duckweed)

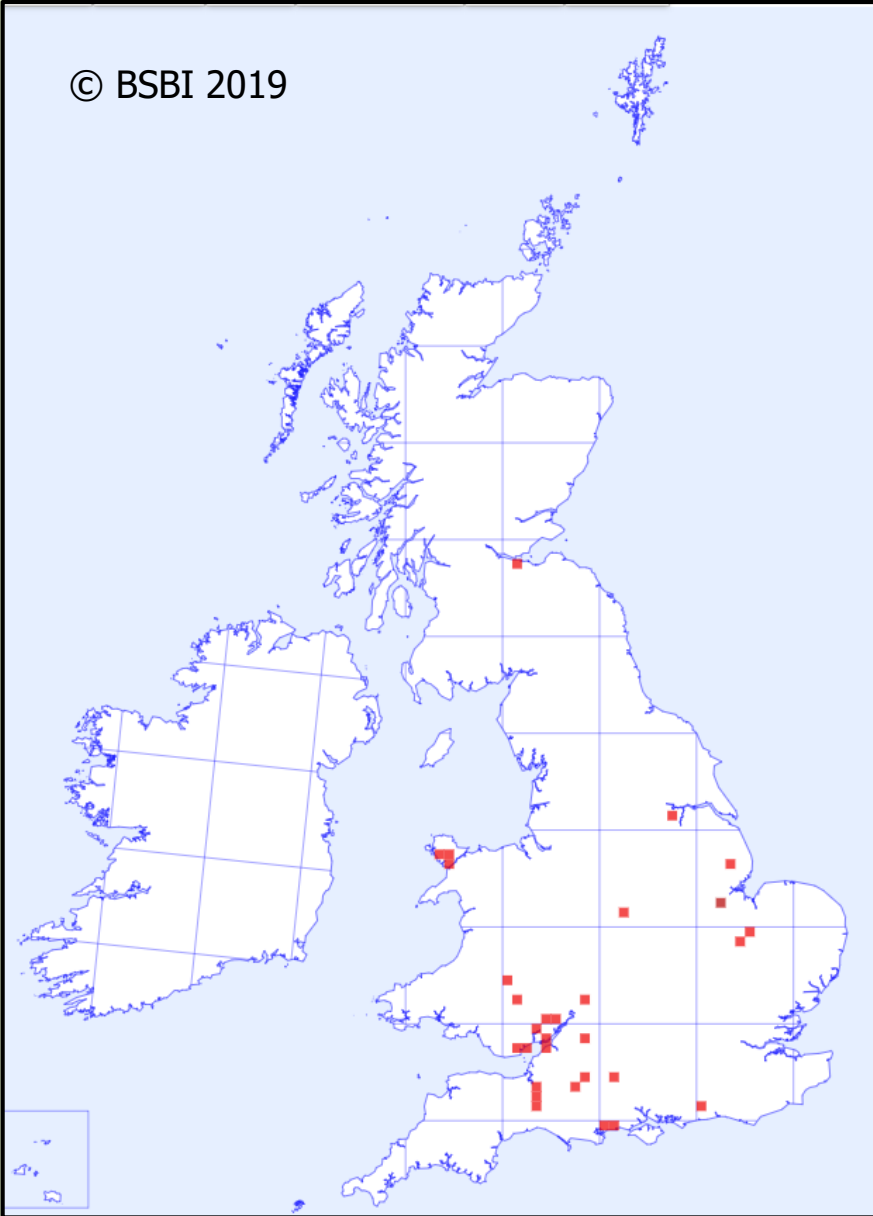


- Ovate, widest in apical half
- Length:width ratio 1-1.5
- Strong red pigmentation, beginning around node
- Fronds appear “dirty”
- Row of papules
- Produces small olive-brown rootless turions
- 3 veins



# *Lemna turionifera* (Red Duckweed)

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## Distribution in Britain

(taken from the BSBI DDb  
Oct 2019)

First found in 2007

Eutrophic ditches  
Ponds  
Rivers

# *Lemna gibba* (Fat Duckweed)



- Frond widest near apex
- Length:width ratio 1-1.5
- Large air cells, may swell
- Red in autumn
- Tertiary veins (where present) arise from node



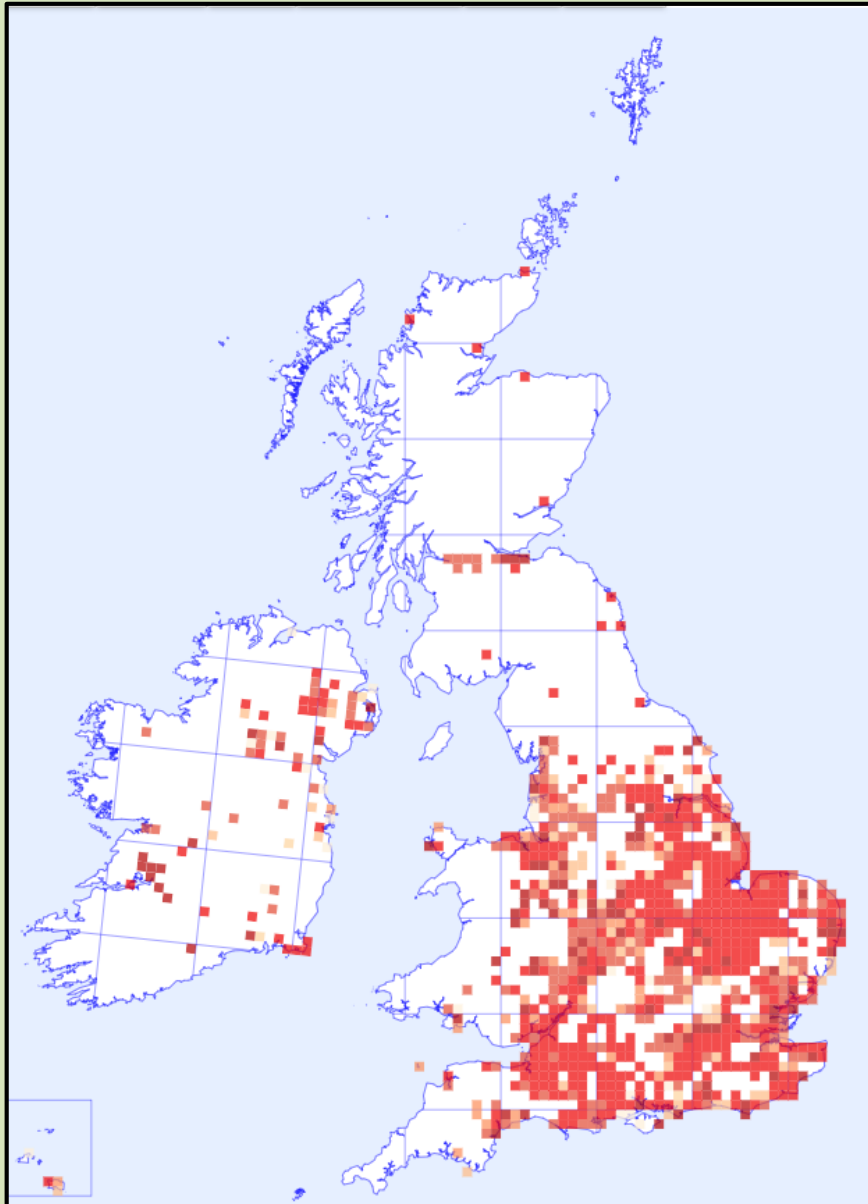
# *Lemna gibba* (Fat Duckweed)

## Distribution in Britain & Ireland

(taken from the BSBI DDb  
Oct 2019)

Rivers  
Streams  
Canals  
Ponds  
Lakes  
Ditches

Tolerant of more eutrophic water  
than *L. minor*





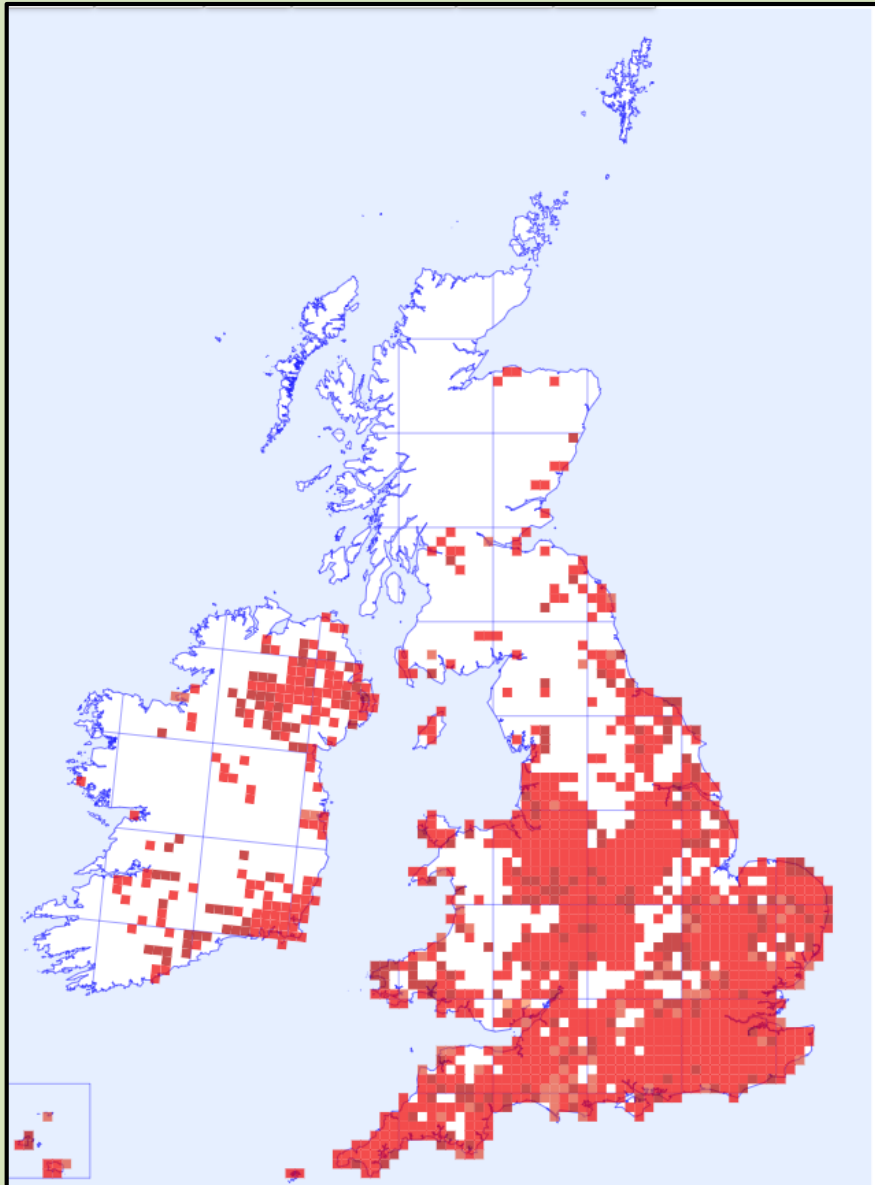
# ***Lemna minuta*** (Least Duckweed)



- Alien (since 1977)
- Fronds elliptical, widest just above mid-point
- Pale greyish-green
- Translucent
- Single vein to  $\frac{2}{3}$  of distance from node to tip
- No red pigmentation



# *Lemna minuta* (Least Duckweed)



## Distribution in Britain

(taken from the BSBI DDb  
Oct 2019)

NB First found in 1977

Eutrophic ditches  
Ponds

Shade tolerant

## ***Lemna valdiviana***



## ***Spirodela punctata***

only Treborth Botanic Garden, Bangor



**Other aliens to look for:**

***Lemna aequinoctialis***

***Lemna perpusilla***

Both have been found amongst aquatics  
in a garden centre



A close-up photograph of a dense patch of aquatic plants, likely duckweed, floating on a body of water. The plants consist of small, rounded, green leaves, some of which are tinged with reddish-pink. The leaves are densely packed together, covering most of the water's surface. The water is dark and still, reflecting the light. A semi-transparent text box is overlaid in the center of the image.

How many species?