

# Introduction to Duckweeds



Helena Crouch & Fred Rumsey

# Old Lemnaceae : 4 genera (now in Araceae)

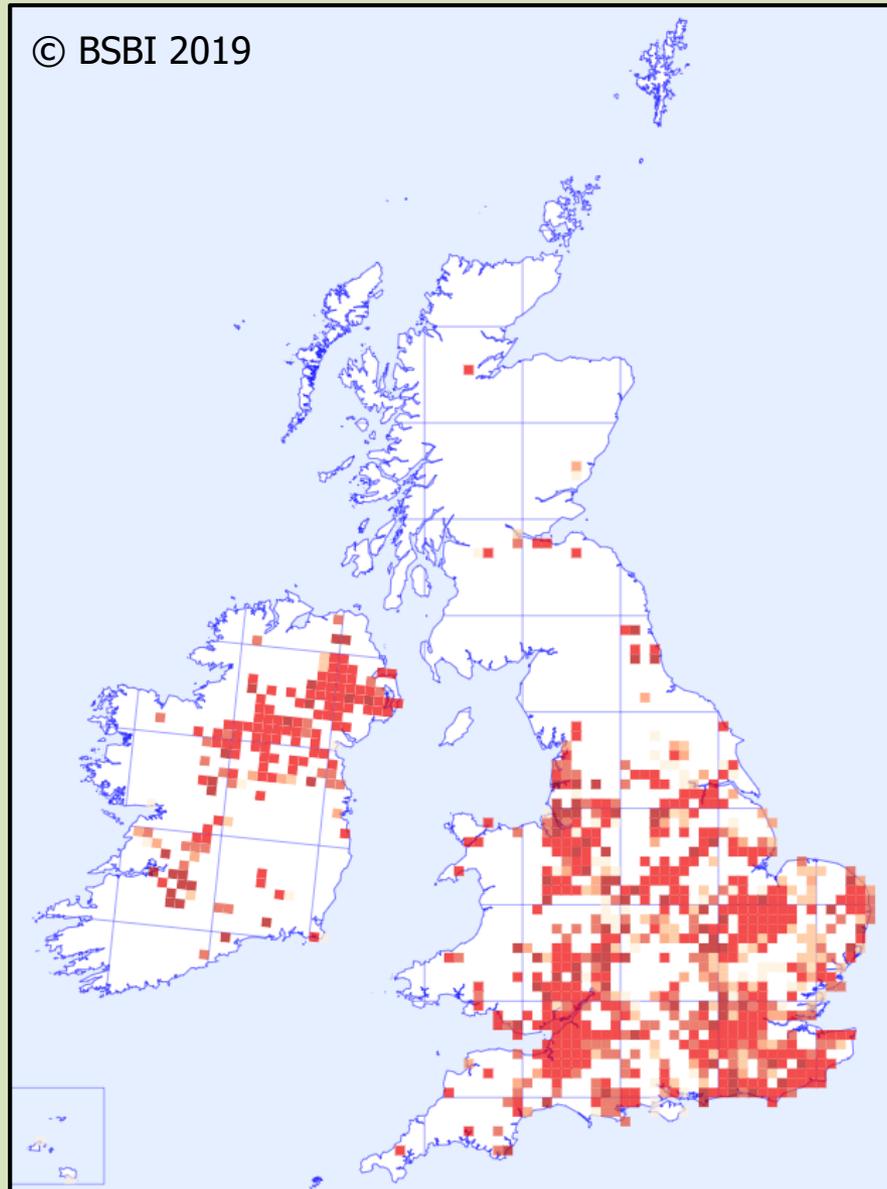
<b><i>Spirodela</i></b> (3 spp) (including <b><i>Landoltia</i></b> )	<b><i>Spirodela polyrhiza</i></b> <b><i>Spirodela punctata</i></b>	7-10 roots 2-5 roots
<b><i>Lemna</i></b> (14 spp)	<b><i>Lemna gibba</i></b> <b><i>Lemna minor</i></b> <b><i>Lemna turionifera</i></b> <b><i>Lemna trisulca</i></b> <b><i>Lemna minuta</i></b> <b><i>Lemna valdiviana</i></b> <b><i>Lemna aequinoctialis</i></b>	1 root 1 root 1 root 1 root 1 root 1 root 1 root
<b><i>Wolffiella</i></b> (10 spp)		No roots
<b><i>Wolffia</i></b> (11 spp)	<b><i>Wolffia arrhiza</i></b>	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)

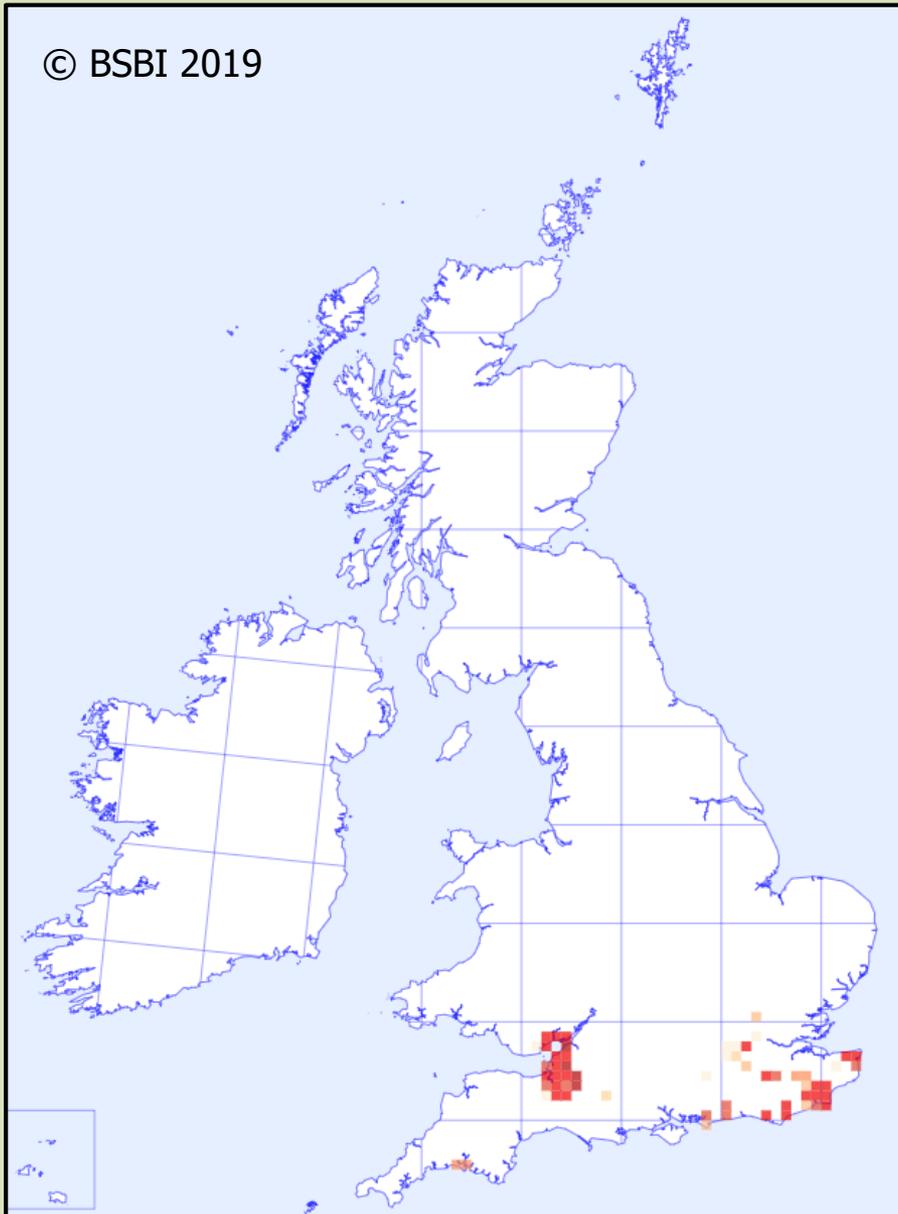
Tolerant of some eutrophication

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



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

# *Wolffia arrhiza* (Rootless Duckweed)



## Distribution in Britain & Ireland

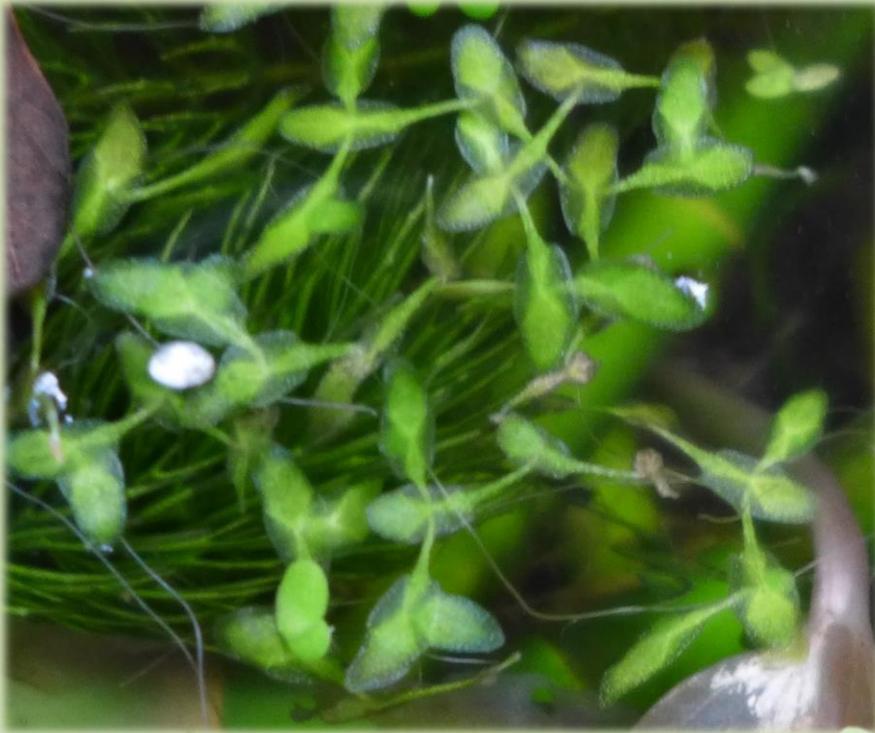
(taken from the BSBI DDb  
Oct 2019)

Ditches  
Ponds

Base-rich water

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

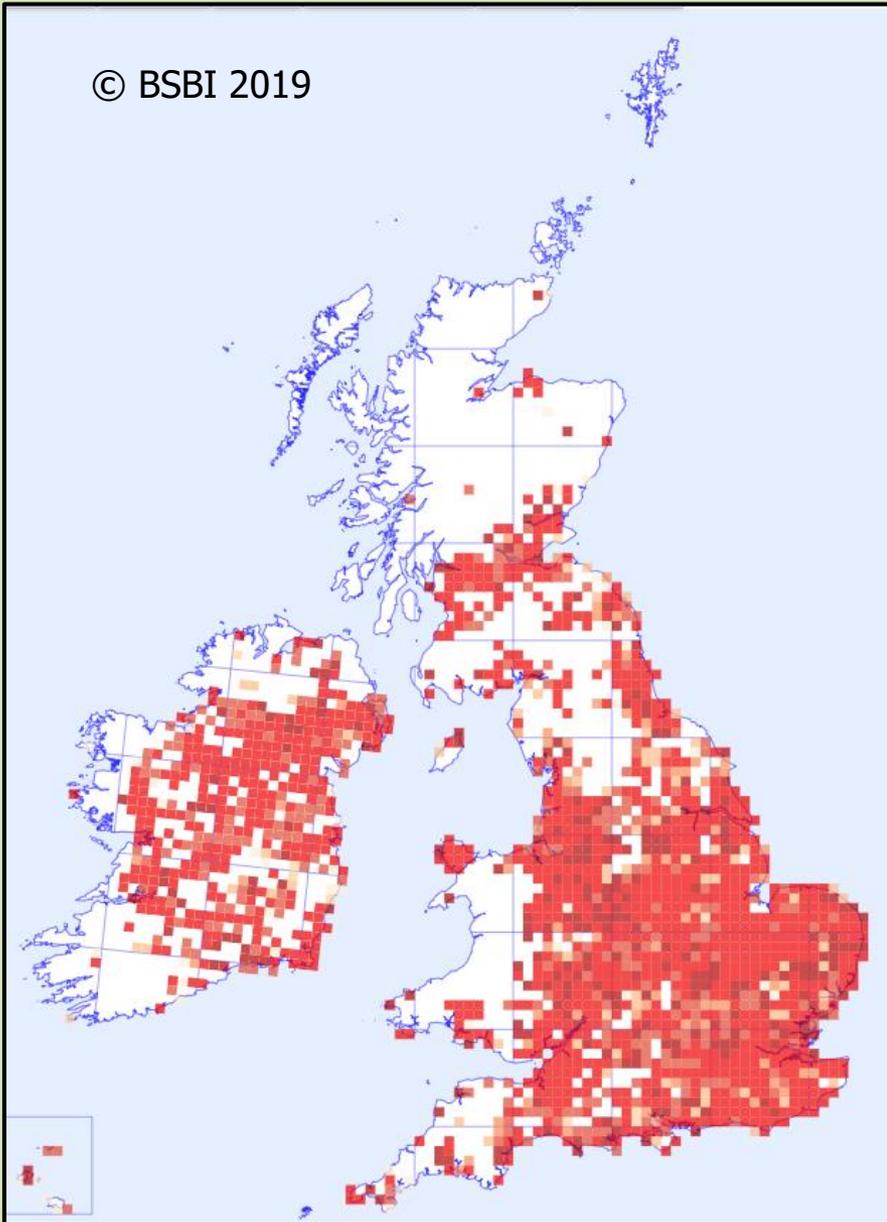
# *Lemna trisulca* (Ivy-leaved Duckweed)



- 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

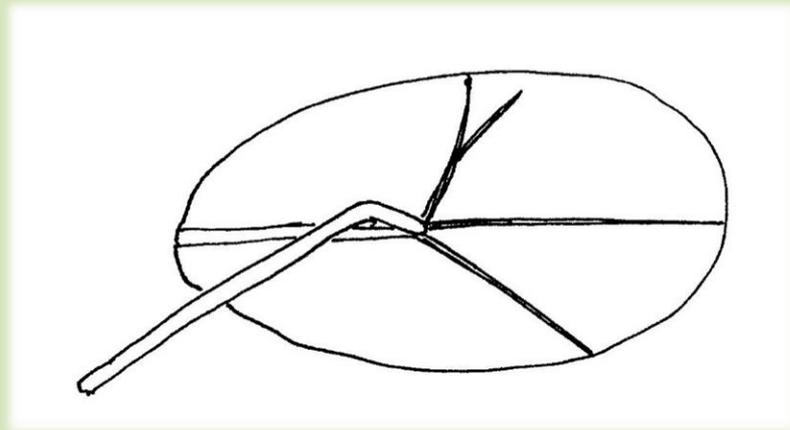


- *L. turionifera* has bumps along the frond. **Note red coloration around big bump at node**

- *L. minor* can have pappules too, but no red coloration



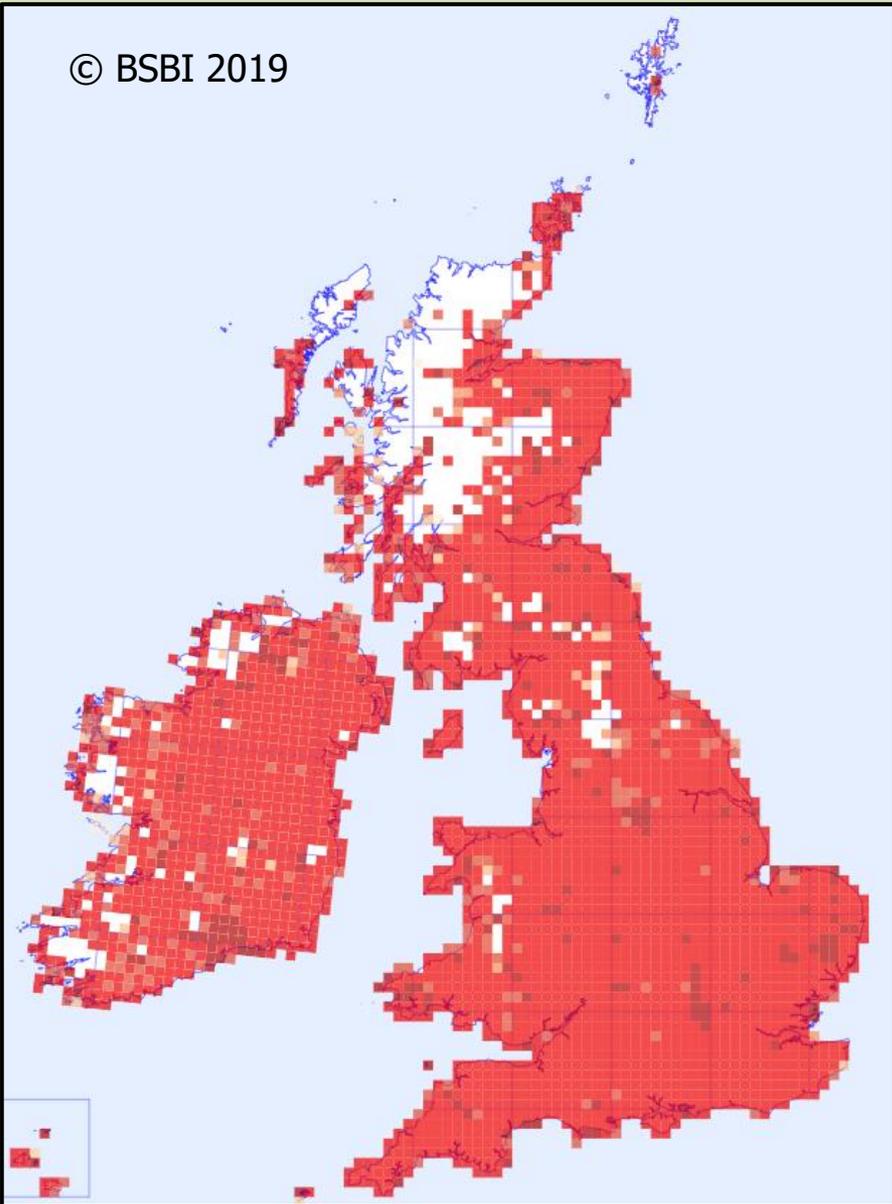
# *Lemna minor* (Common Duckweed)



- 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

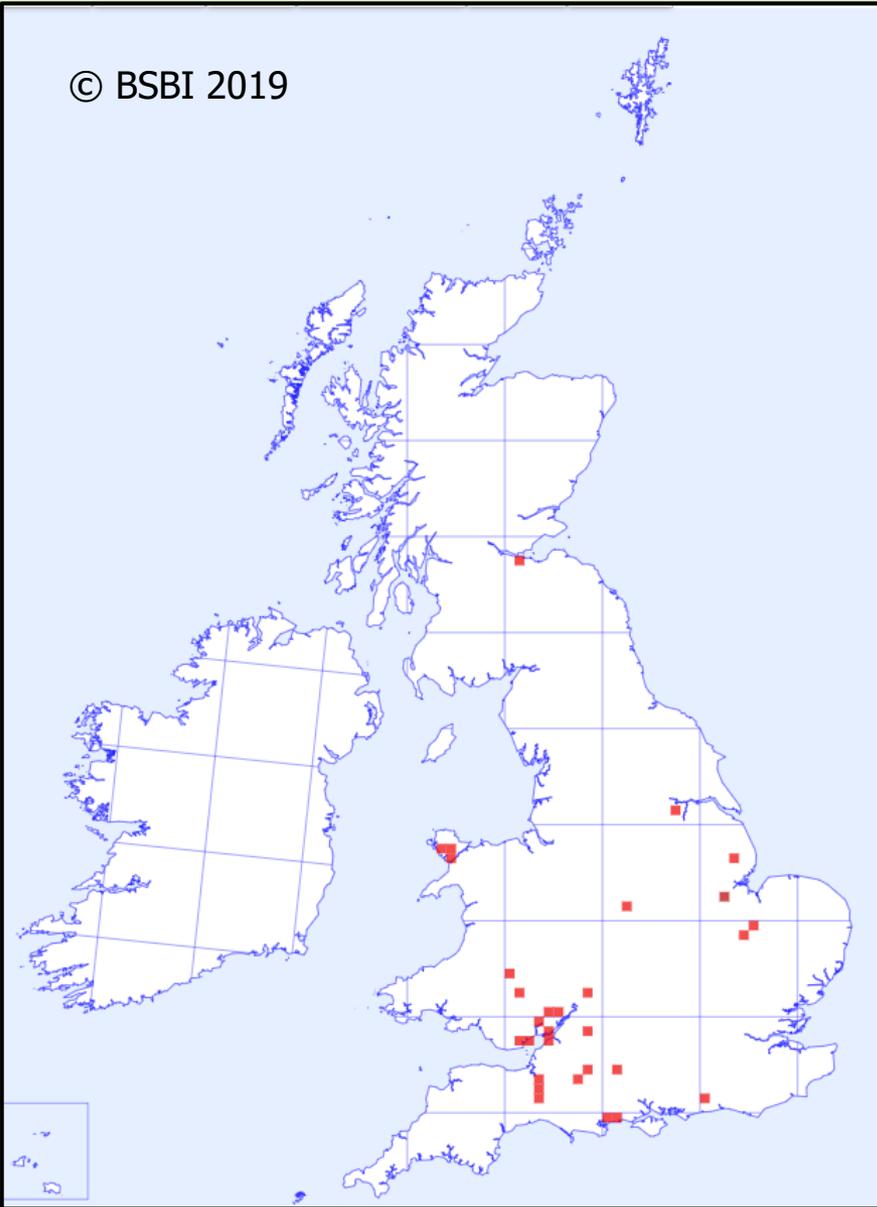
# *Lemna turionifera* (Red Duckweed)



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

# *Lemna turionifera* (Red Duckweed)

© BSBI 2019



## 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



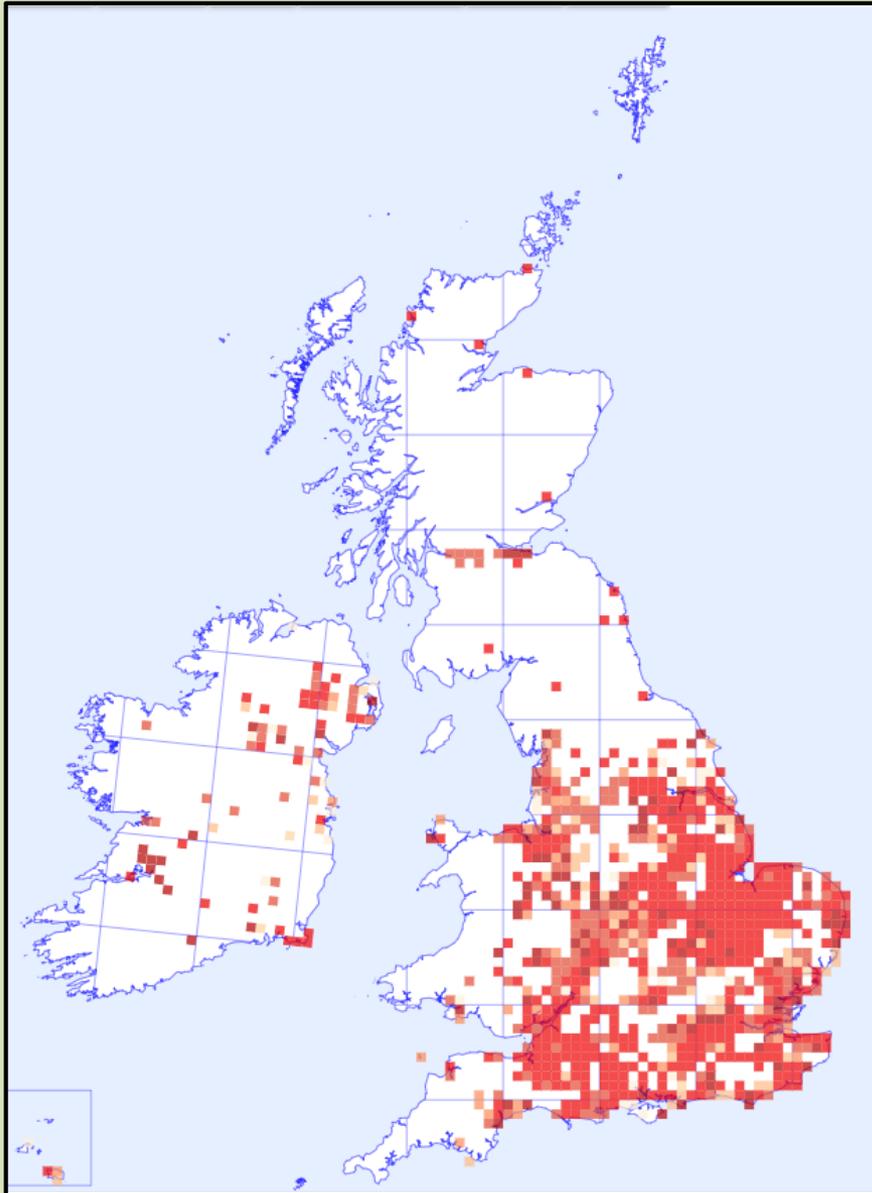
# *Lemna gibba* (Fat Duckweed)

## 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*

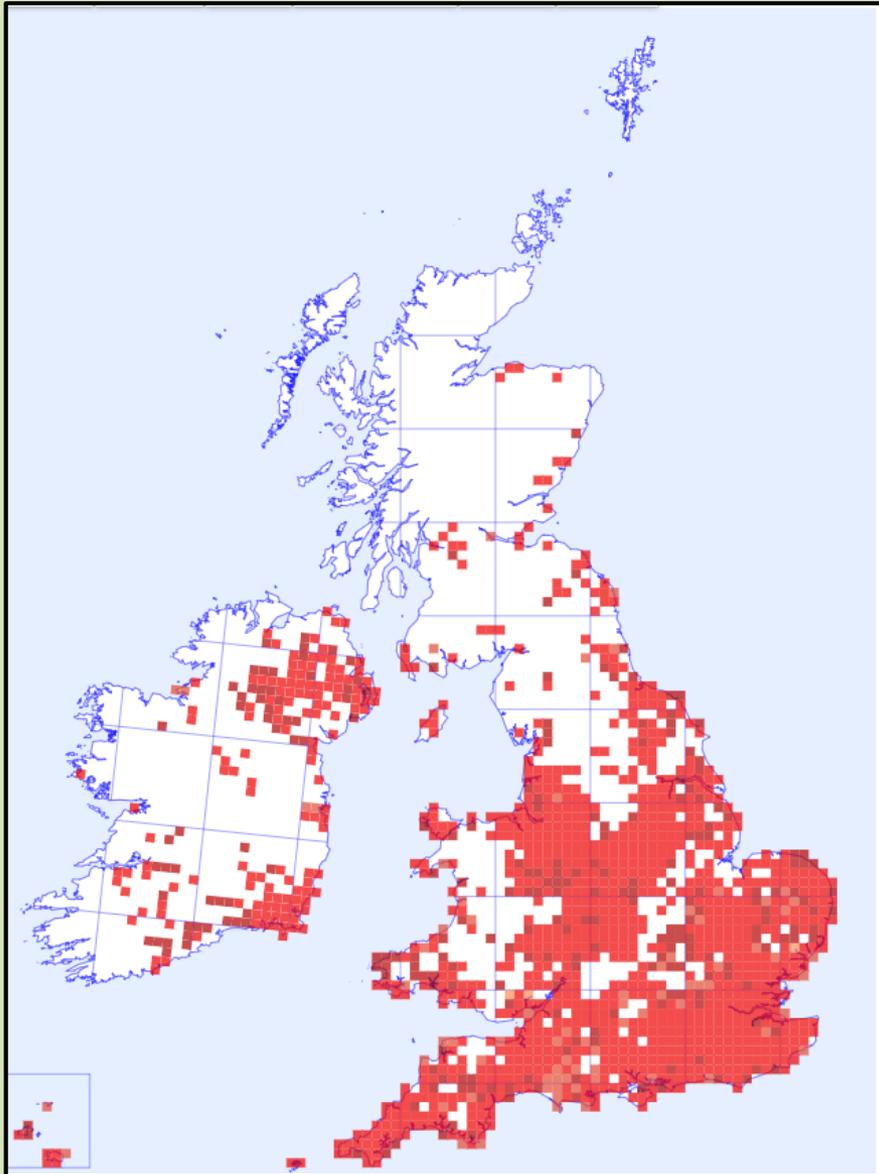


# *Lemna minuta* (Least Duckweed)



- Alien (since 1977)
- Fronds elliptical, widest just above mid-point
- Pale greyish-green
- Translucent
- Single vein to 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 water is dark and reflects the surrounding foliage. The overall scene is a lush, textured expanse of floating vegetation.

How many species?