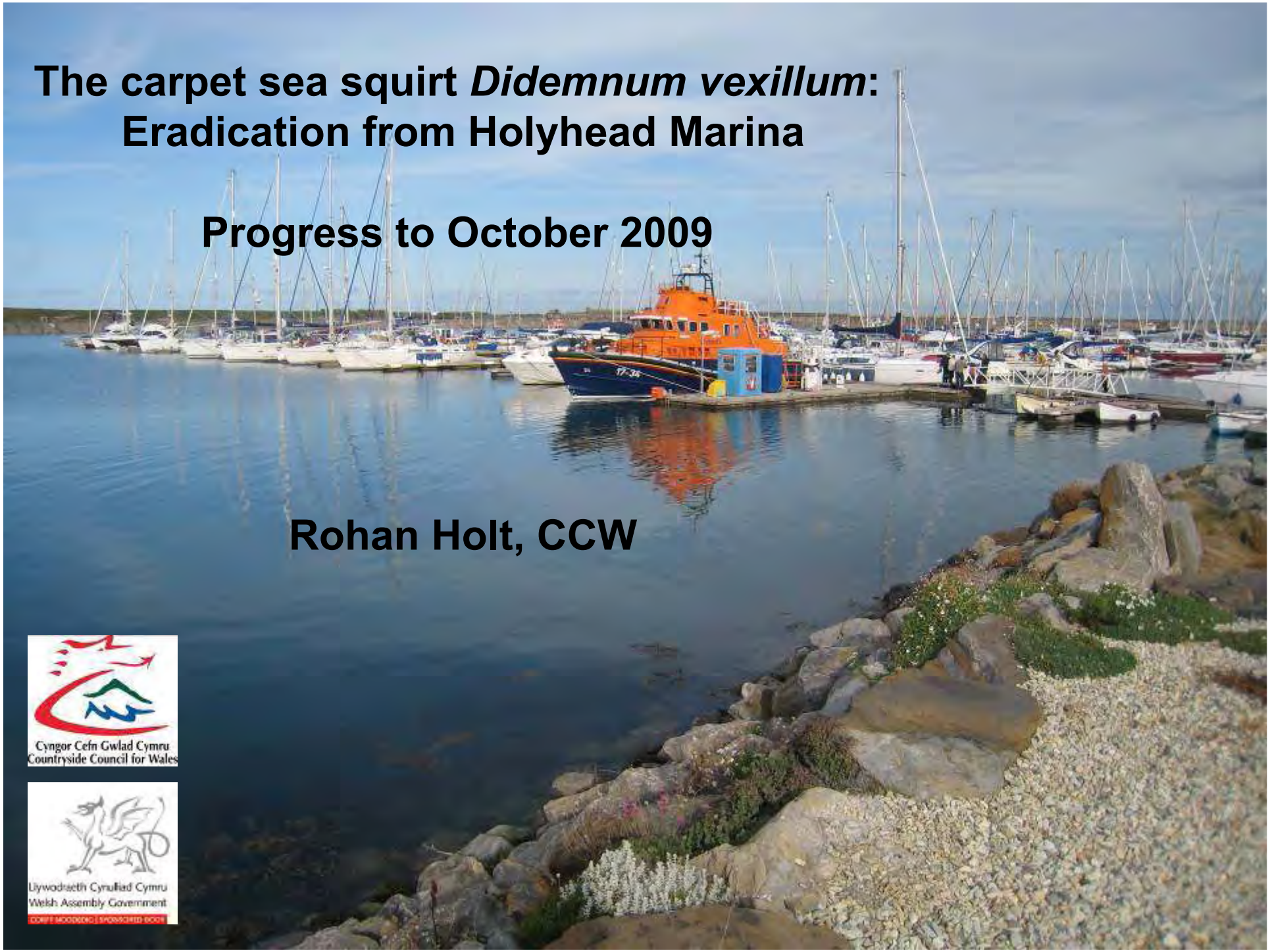
The carpet sea squirt *Didemnum vexillum*: Eradication from Holyhead Marina

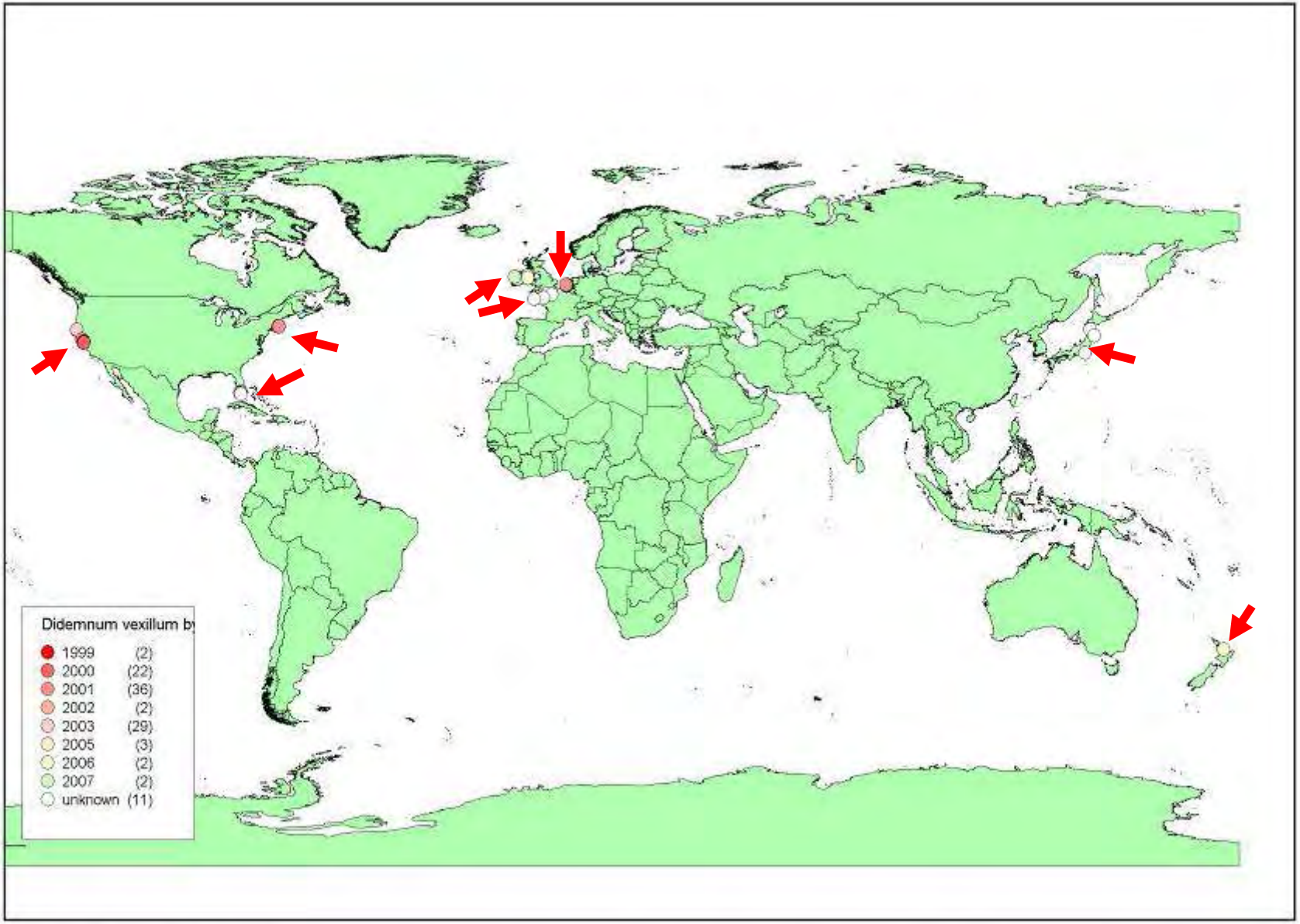
Progress to October 2009

Rohan Holt, CCW



Cyngor Cefn Gwlad Cymru
Countryside Council for Wales

Llywodraeth Cynulliad Cymru
Welsh Assembly Government



Produced by CCW on: 29 September 2009

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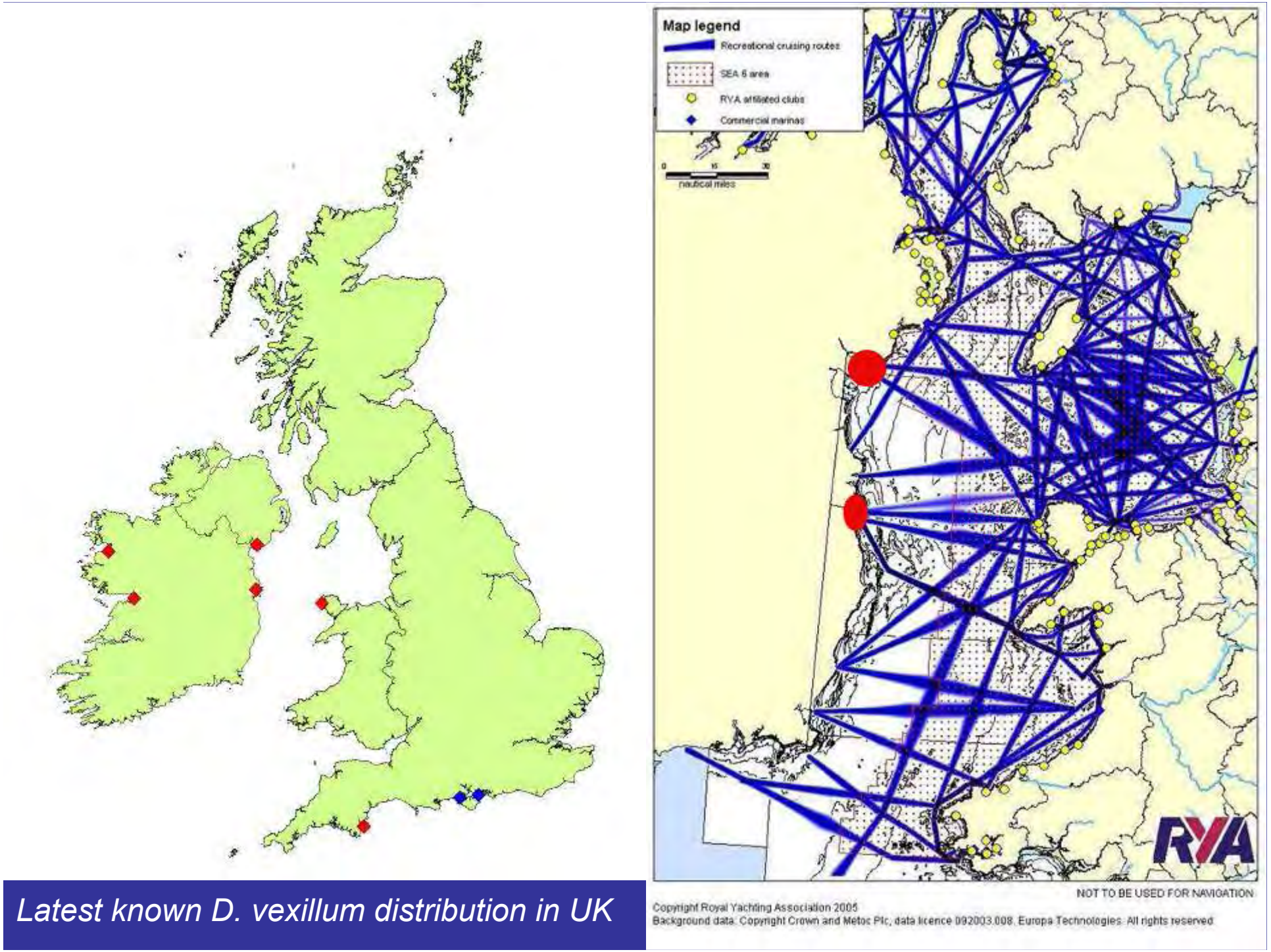
Background

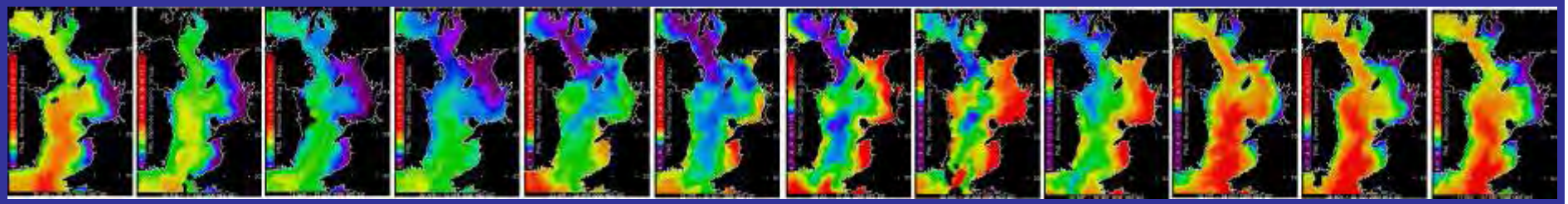
Major problems with Didemnum vexillum:

-hanging culture lines (New Zealand)
-on mussels
-on gravel substratum
(e.g. Georges Bank USA – hundreds km sq)
-on stable sand
-marina pontoon and harbour structures



Latest known D. vexillum distribution in UK

What is the likelihood *D. vexillum* will establish in Welsh waters?



Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

Temperature in mainland coastal areas:

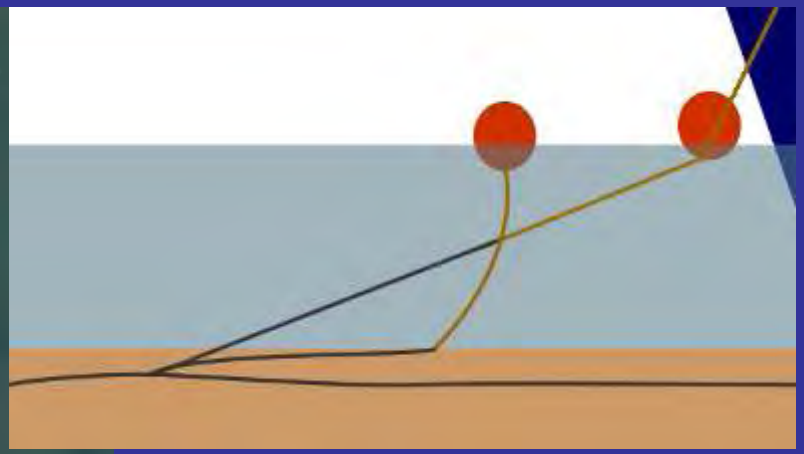
<5-10°C	>10°C	>14°C	>10°C	<5-10°C

At least 6 months optimal growth conditions in some areas – (14-18°C)

Even in least suitable areas, at least 6 months in conditions suitable for growth (>9-10°C).

Deep water reefs are likely to have less variability…

What is the likelihood it will spread to all available habitats within Holyhead Harbour…. and beyond?



No shortage of suitable substrata but not yet colonised – why not? Possibly separation between commercial and leisure craft?

So what are CCW doing about it?

Surveyed all likely areas within Holyhead harbour area including boat hulls in the marina

Then expanded survey to all marinas and moorings within Welsh waters – completed summer 2009

Non-Native Marine Species Alert

CARPET SEA SQUIRT

Didemnum vexillum

What is *Didemnum vexillum*?

Didemnum vexillum (common name the Carpet Sea Squirt) is an invasive non-native species which has recently been found in North Wales. Thought to be originally from Japan it has become a pest in other countries because it grows very quickly and can smother habitats and species and interfere with fishing, aquaculture and other activities.

What does it look like?

The Carpet Sea Squirt can be difficult to identify as it looks similar to some native species, but the following characteristics can help to identify it;

- The surface has a leathery texture (it is not slimy like other sea squirts) and has a noticeable veined surface (Fig 2).
- It has an orangey or mustard/tan colour which is fairly distinctive from our native species.
- It can grow either as thin flexible sheets, often overgrowing other species, or in long rope-like growths (Fig 1).

How does it spread?

The Carpet Sea Squirt releases larvae which can settle close to the parent colony or potentially be spread on marine equipment e.g. trailers and dinghies. It can also spread to new areas on the hulls of infected boats and fragments can easily reproduce.

How can I help to stop it spreading?

- Keep your hull and marine/fishing equipment clean and free of fouling and treated with an appropriate anti-fouling paint.
- When travelling in the UK keep an eye out and report any sightings of this or other invasive species (see www.thegreenblue.org.uk) to the CCW enquiry line given below.
- If you are a berth-holder in North Wales please check your hull and fishing/marine equipment for signs of fouling.
- Use a closed loop or filtered wash down facility and/or steam clean your hull if needs be.
- If you do remove fouling i.e. weed, please dispose of it carefully and do not allow any to go back in the water.

What do I do if I think I have found the Carpet Sea Squirt?

Please contact the CCW enquiry line, **please do not try to remove any Carpet Sea Squirt while your vessel is in or near the water and do not move or take your boat out of the marina**, if you do the species may spread to other areas.

For more information or to report any sightings please call the CCW enquiry line on

0845 1306 229

For a full fact sheet on invasive species visit our website www.thegreenblue.org.uk and follow links under 'You and your boat'

The Green Blue

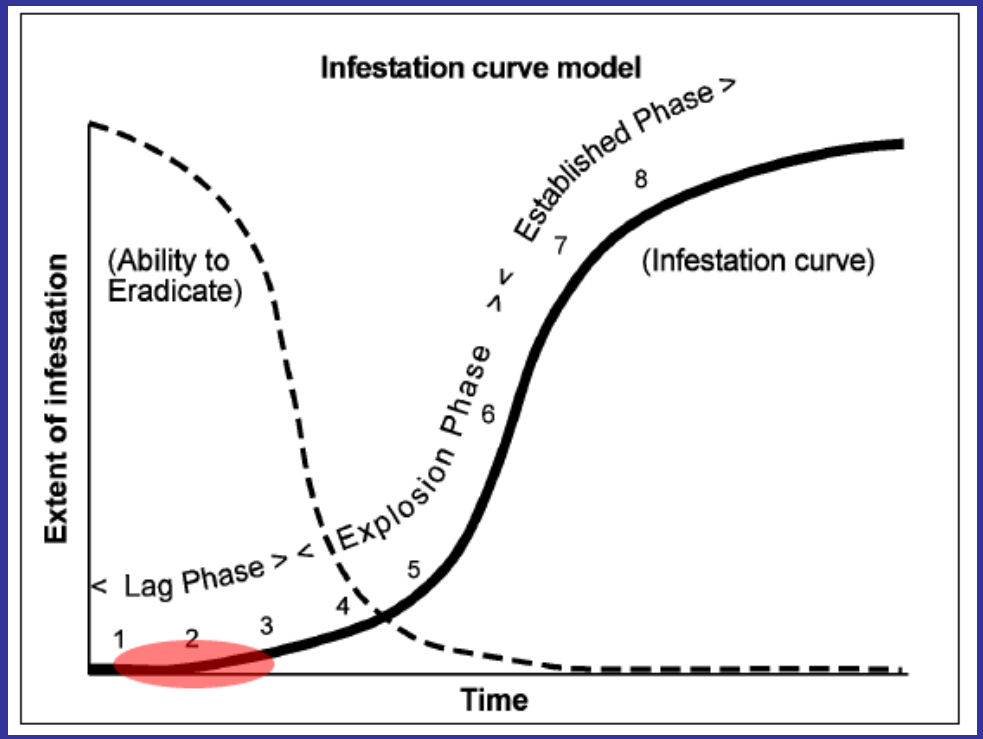
Didemnum vexillum (Carpet Sea Squirt) which has colonised a propeller shaft (Fig 1)

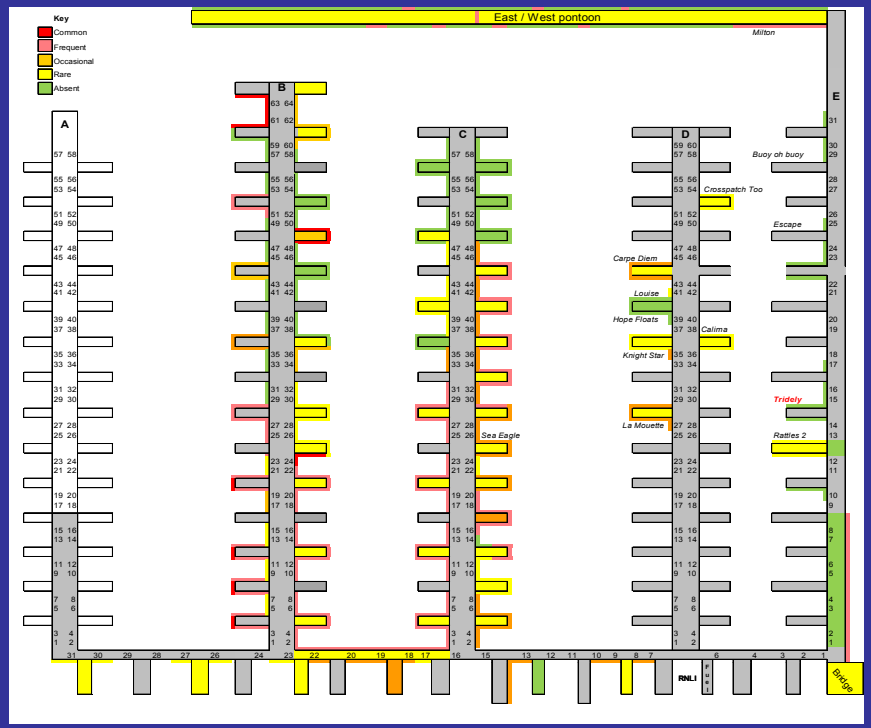
The visible distinctive water channels (fig 2)

Carpet Sea Squirt colony growing on the hull of a heavily fouled vessel

Colonies of Carpet Sea Squirt growing on native species

- Surveys: autumn 2008; winter 2009; July 2009 – growth rate suggests in ‘lag phase’ but perhaps accelerating –
- August/September up to 3 x amount - looking like ‘explosion’ growth phase. Starts to fractionate as well as producing larvae.



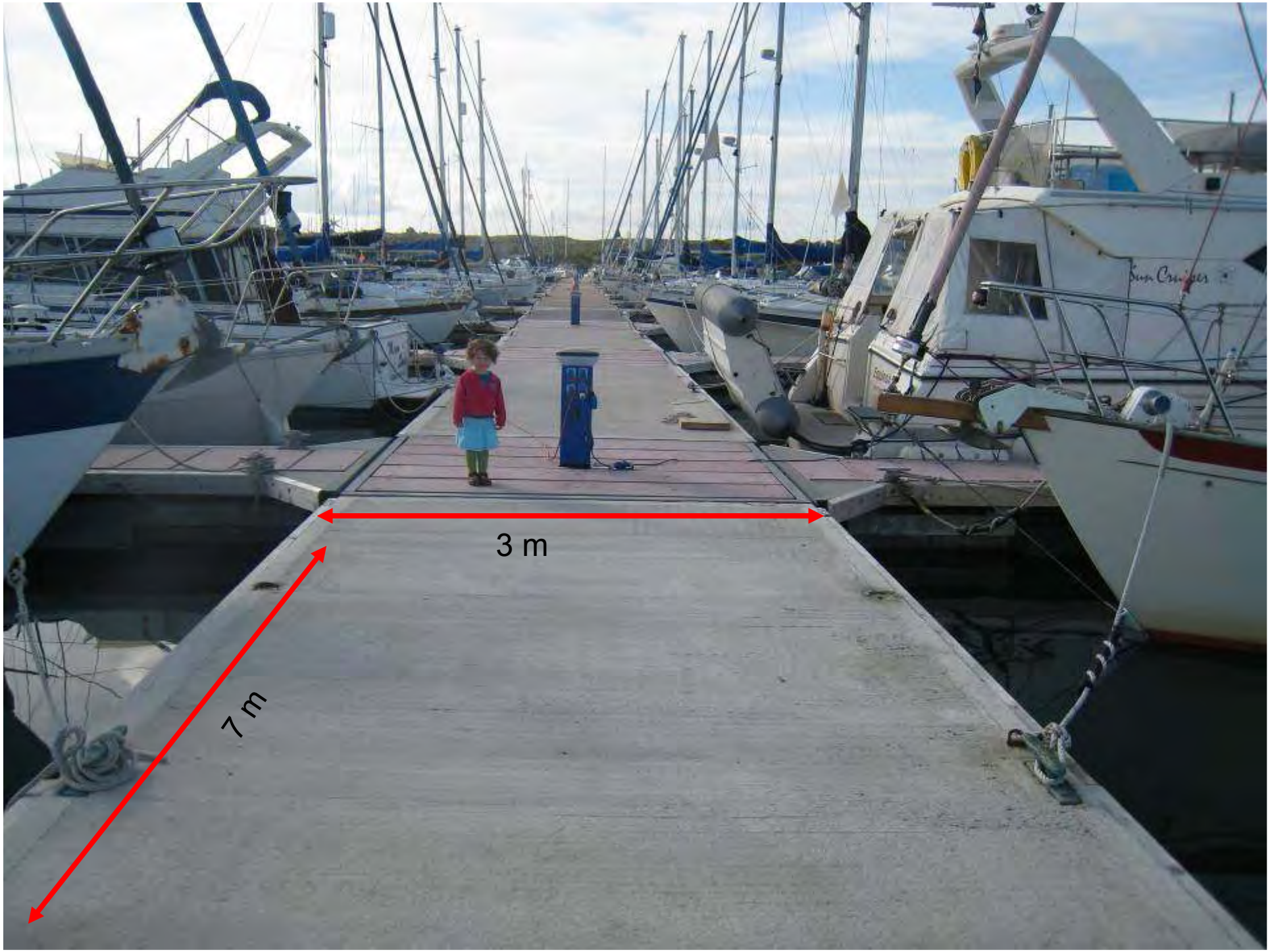


July 2009 survey data (Irving 2009)

- *D vex* on CCW's 'Risk Register' - CCW raised status of alert to 'emergency' similar to status of oil spill. Accelerate procurement and contractual procedures ☺
- 3 sets of contractors in place:
  Diving support 'call-off' *with Marine Ecological Solutions (Harry Goudge & Liz Morris)* - to help make up minimum dive team size required by HSE (inshore commercial code for main eradication – not scientific ACOP)
- Two Eradication contractor teams in 'friendly competition' to come up with best designs & methods during the pilot:
  1. Eradication R&D + diving logistics / engineering
     (Martin Sampson, Anglesey divers).
  2. Eradication R&D and business side (bag making and grant seeking).
     UK Biosecurity (Adrian Sharratt & Hayden Jones)

- Scoping study completed – ‘quantity surveying’ – see below
- Pilot well underway – sub-set of pontoons & chains – 19 bagged and 3 completed to date. Scaling up production of bags and wraps
- FEPA / Liaison / Consultation / Providing advice
- Recruited Ashley Cordingley to CCW as project assistant and make up full HSE dive team
- Full scale eradication should be underway by early November with view to 100% first wave cover by early spring 2010.
- Monitoring programme to ensure the eradication measures are working, detect re-infection, check its not spreading or arrived elsewhere in harbour / Wales.

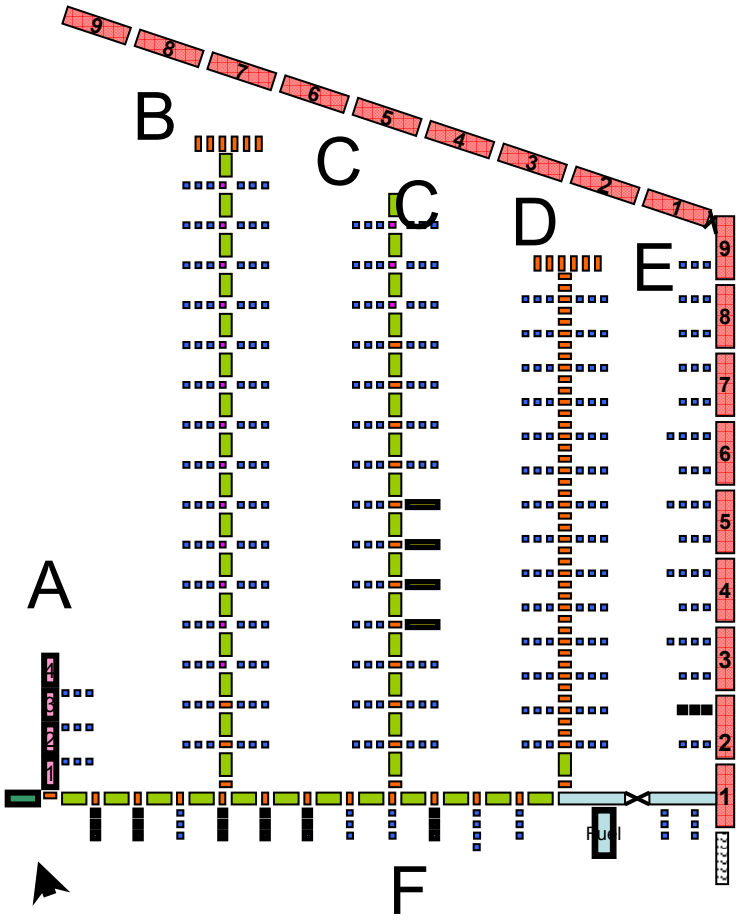

250 berth marina…
1.2 m x 1 m


3 m
7 m

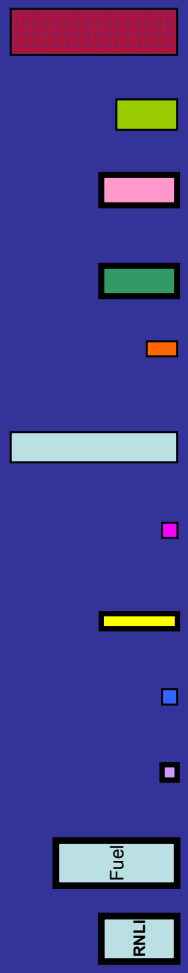

10 m
4 m

X 16 breakwater pontoons

HOLYHEAD MARINA near-scale plan of pontoon floats



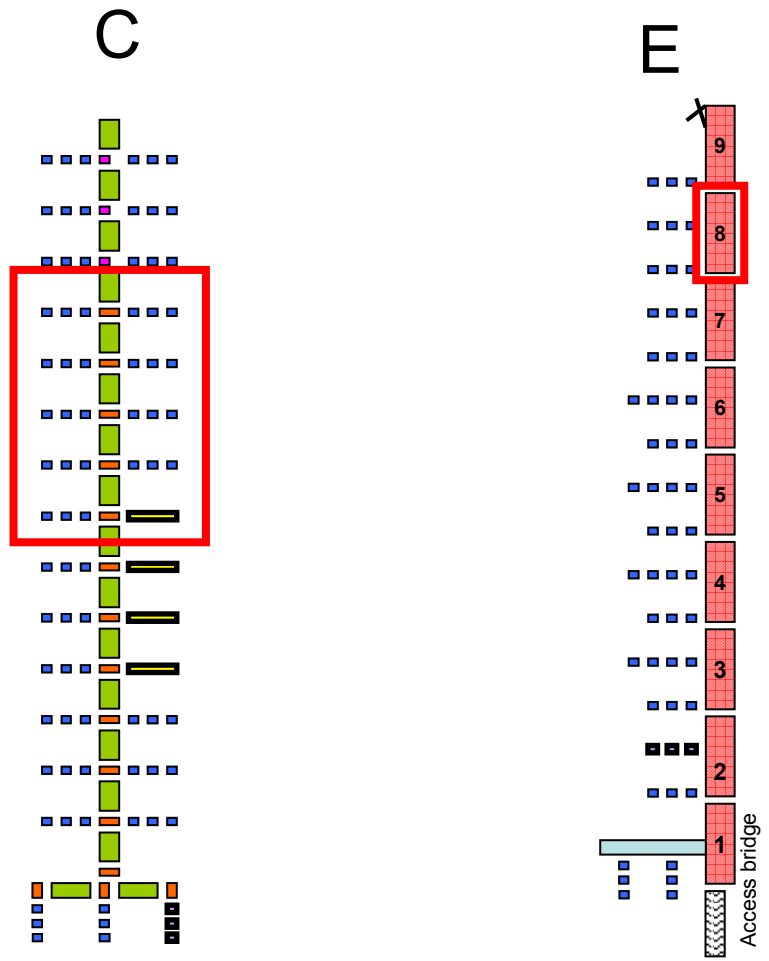
Approx scale – 50 m



# pontoon units	Unit area to be treated m^2	Total area to be treated m^2
18	113.76	2047.68
44	32.45	1427.80
4	43.44	173.76
1	32.21	32.21
80	7.62	609.60
2	92.2	184.40
26	5.41	140.66
4	19.56	78.24
323	3.73	1204.79
21	4.43	93.03
1	86.65	86.65
1	60.06	60.06
525		**6,138.88 m^2**

+ chains and moorings = approx 7,000 m^2 = football pitch

Pilot eradication study areas on walkways C and E




Profec

Wrapping chains in sheet plastic…

After 8 days the bags are removed and stagnant water allowed to disperse. The tough tests of the *D vex* are still very much apparent but are dead - compared to living material they have changed texture and colour and disintegrate completely in a few more days.

Is it cost effective?

Eradication plan description	Method/s Tools for management	Likelihood of success	Estimated cost (over 10 years)
Full eradication in 2009 with follow up treatment in 2010 and 2011 where necessary	Control tools: • Plastic / bag wrapping with or without accelerant • Plastic smothering • Removal • Freshwater? Monitoring and surveillance Communications Voluntary vector controls	50% chance of eradication in 2009 with 95% in 2010 and 2011 Success is dependant on confidence of surveys conducted in 2008/2009 Uncertainty through 'late start' and rapid growth in 2009	£385,000 in first 3 years Ongoing monitoring after 3 years estimated to be £20,000 per year Costs after 3 years dependant on success of eradication. If eradication failed after 3 years review and/or terminate programme.

DO NOTHING

£1,375,125 to £6,875,625 over 10 years impact to the mussel industry alone.