Slipper Limpet Management and Utilisation - Fal Case Study

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FITZGERALD, A. (2007).
SLIPPER LIMPET UTILISATION AND MANAGEMENT. PORT OF TRURO OYSTER MANAGEMENT GROUP

Slipper Limpet Impact - Ecosystem

- Habitat transformer
- Ultimate loss of biodiversity
  (inc. native oyster and maerl both protected in UK BAP)

Blanchard, M. and Hamon D 2006 Bilan du suivi de l'exploitation industrielle de la crepidule en Bretagne Nord (baies de Saint Brieuc et du Mon Saint-Michel), 2002-2005. IFREMER report DYNECO/EB/06-01

Slipper Limpet Impact - Fisheries

- Competition for food and space
- Increased sorting time
- Handling difficulties
- Movement restrictions

Implications for escape response and compromised survival?

Slipper limpet biogenic ‘reef’
-Salcombe Estuary
Photo: Nigel Mortimer

Slipper limpet infestation of scallops
-Salcombe Estuary
Photo: Kevin Oakman

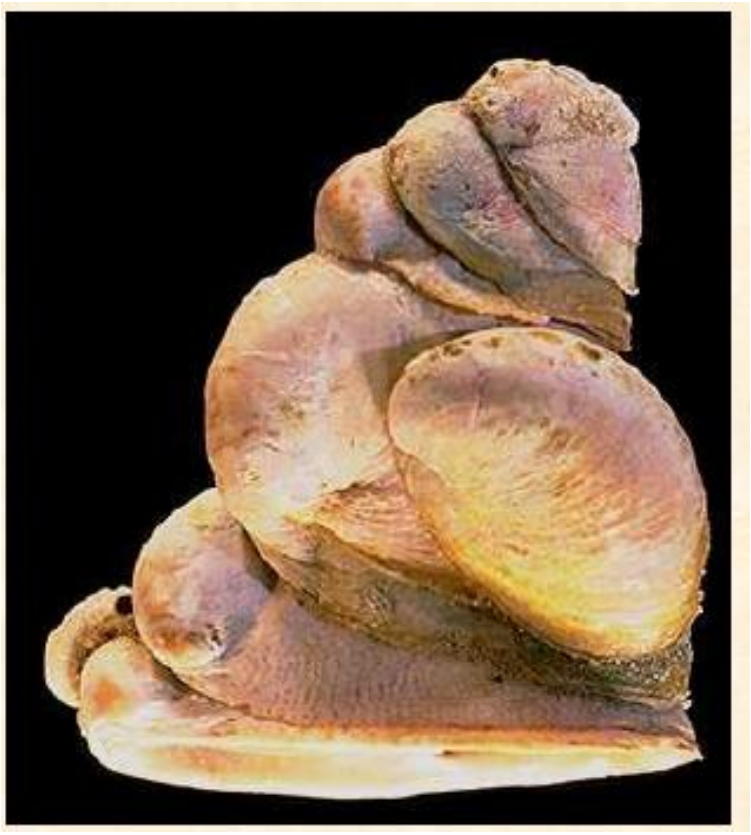
Slipper Limpet – A Successful Invader

How can it out-compete broadcast spawners?

- Disadvantages
  - Slow initial establishment (need to establish “chains”)

- Advantages
  - Reproduction more efficient
  - More spawnings/yr
  - Effective feeding strategy
  - Few predators
  - Wide environmental tolerance
  - Effective dispersal

A “chain” of slipper limpets



Slipper Limpet Historical Catch Rate

First arrived in Fal / Helford after WWII at time of major spread though to be associated with the movement and breaking of ships.

Cole, H.A. 1952 The American slipper limpet (*Crepidula fornicata* L.) on Cornish oyster beds. *Ministry of Agriculture Fisheries and Food*. *Fisheries Investigation Series* 2 17 (7), 1–21.

- Chains/haul

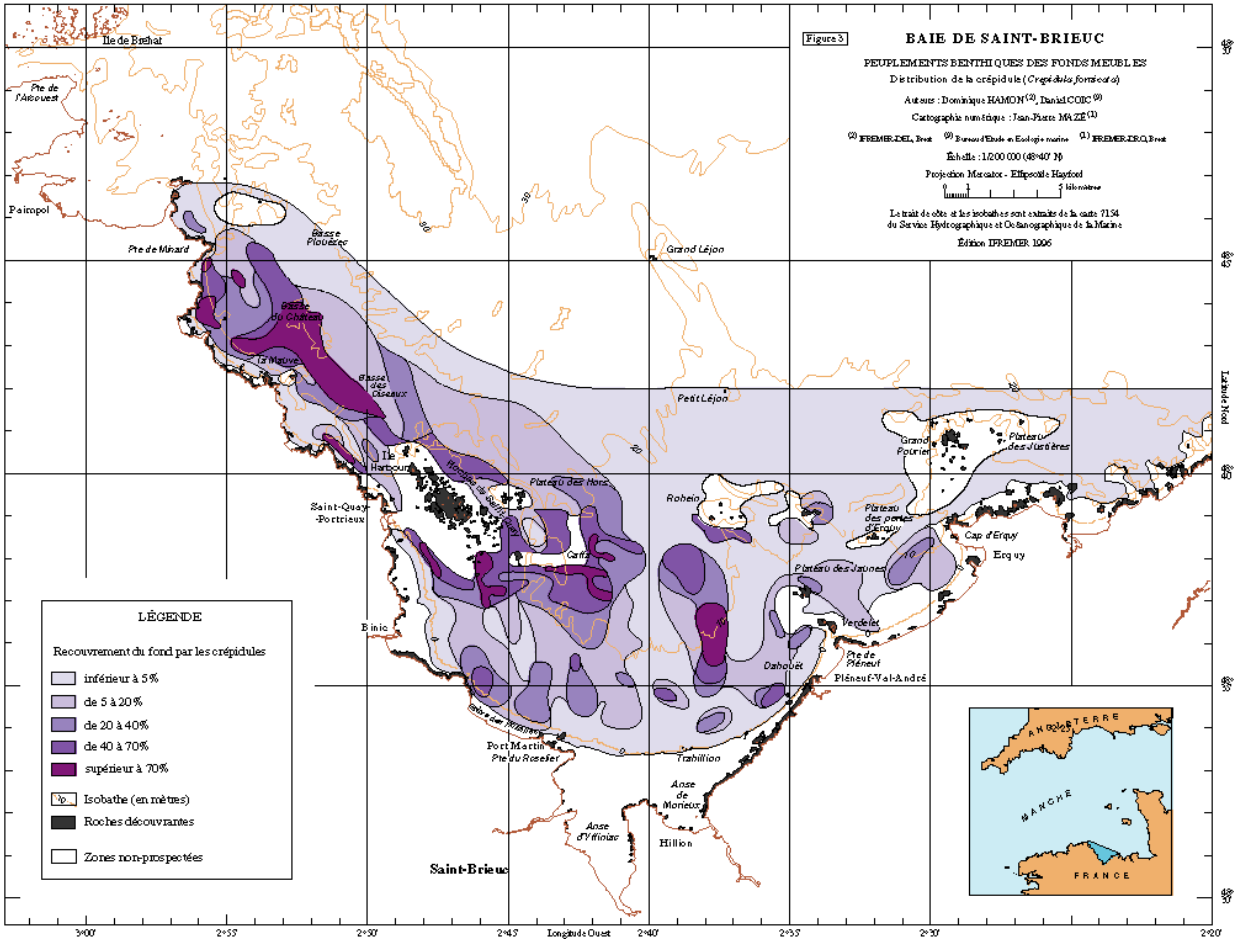
- 1970's-1980's 0-5
- 1980's-1990's 0-5
- 2002 0-5
- 2003 5-10
- 2004 15-20
- 2005 25-30

Could increase be explained by improved water quality (heavy metals & TBT) or could this be temperature (climate change) related? What is happening elsewhere?

Slipper Limpet Case Studies – French Context

- **Slipper Limpet Case Study –St Brieuc Bay**
- (Slipper-limpet distribution in Bay of Saint-Brieuc, in 1994)

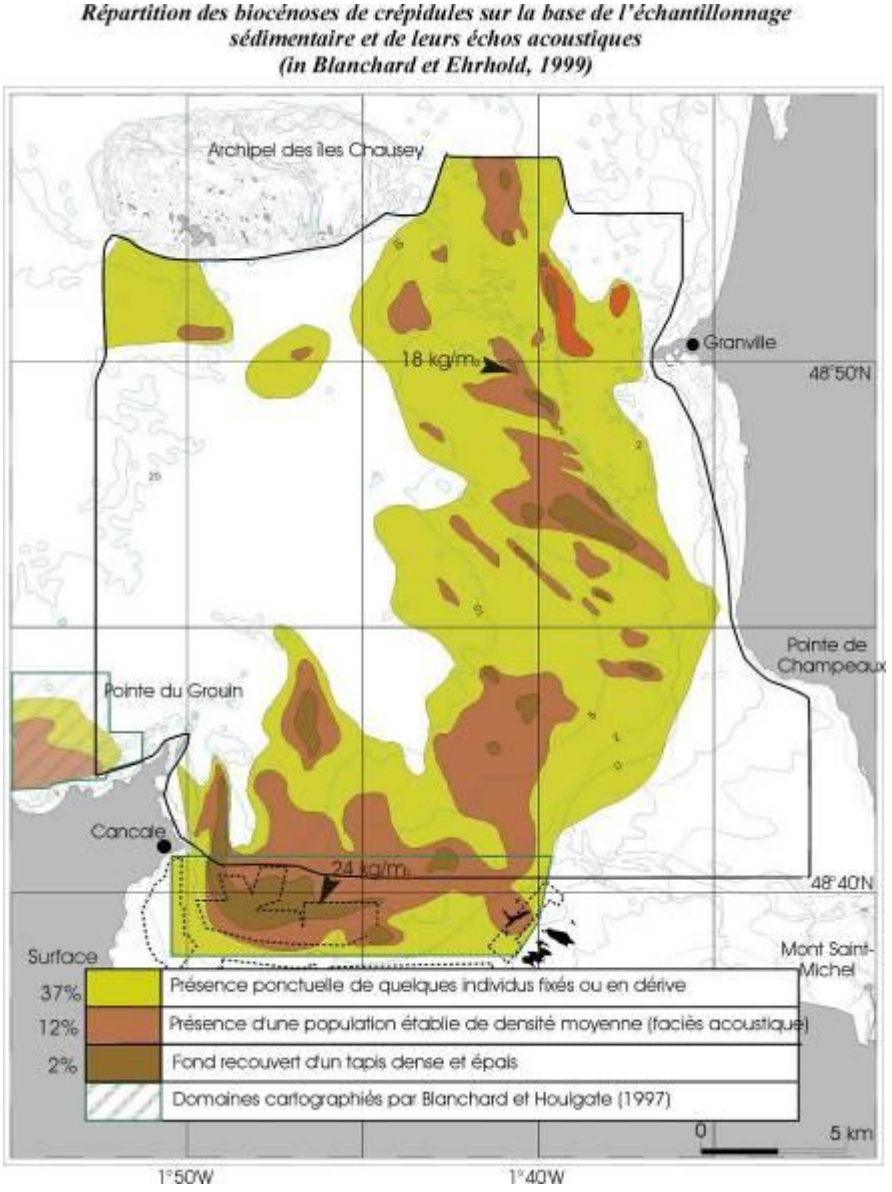
•1994: 250,000t
•Now: 450,000t



Slipper Limpet Case Studies – French Context

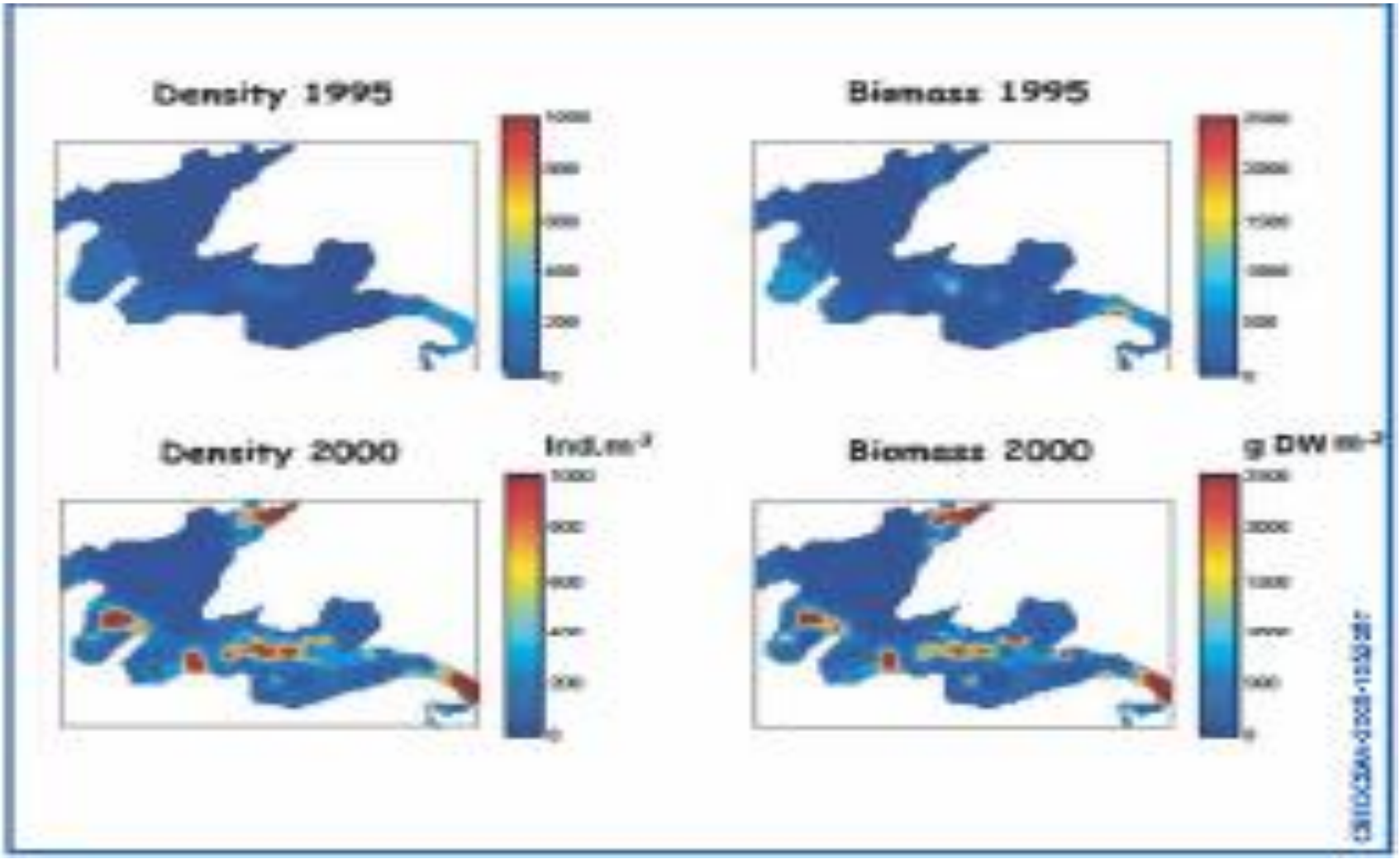
- **Slipper Limpet Case Study**
- **Mont St Michel Bay**
- **(**Distribution de la crépidule en baie du Mont Saint-Michel (Blanchard et Ehrhold, 1999).)

- 1997: 100,000t
- 1997-2004: 43,000t removed
- 2004: 150,000t



Slipper Limpet Case Studies – French Context

- **Slipper Limpet Case Study –Bay of Brest**
  (Ref. CREOCEAN) – Note: 1998 18,500t to 2005 120,000t



Slipper Limpet and Oyster Monitoring

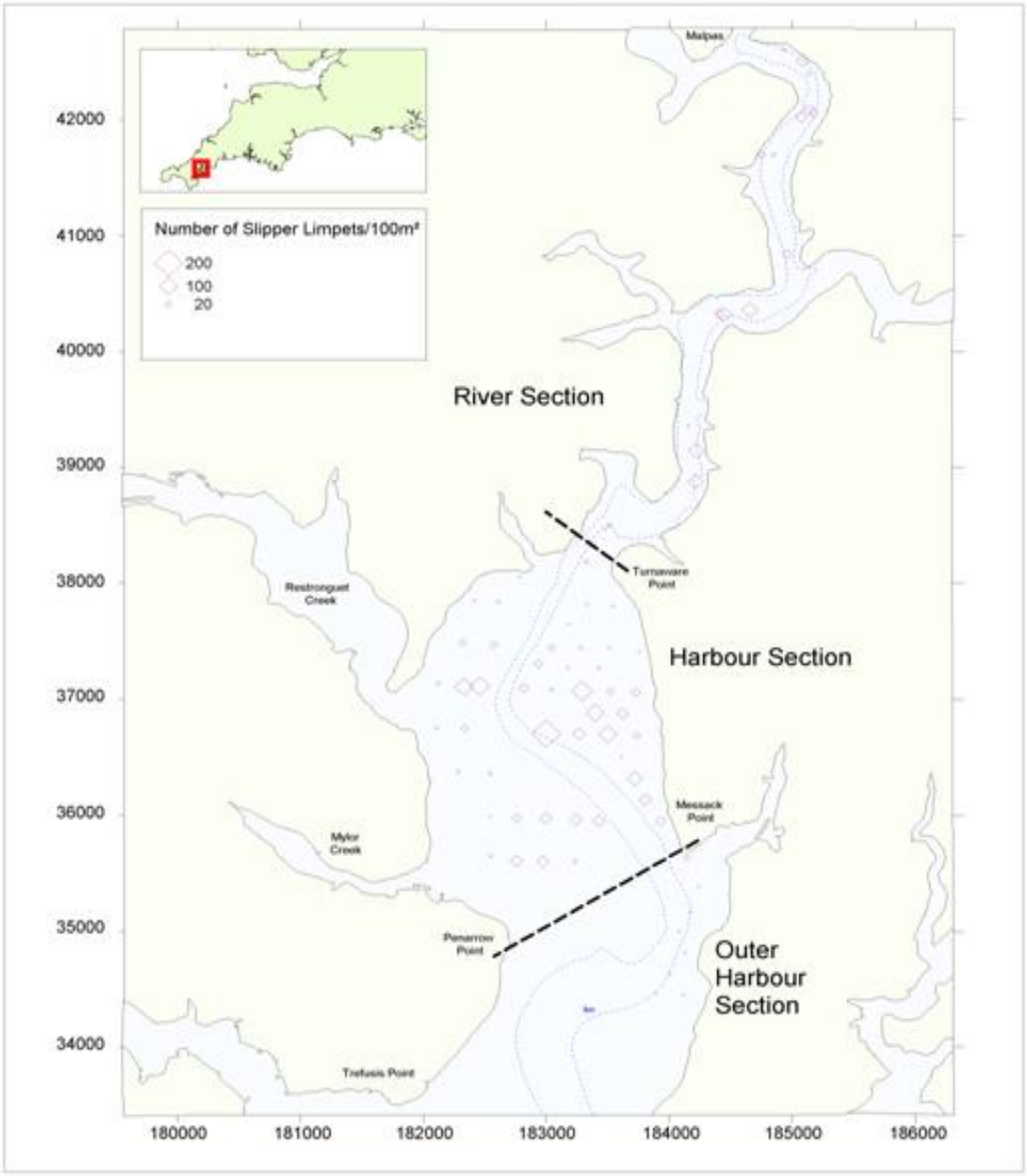
CEFAS, 2006. *Oyster and Slipper Limpet Survey, 7-9 March 2006.* DEFRA/MFA Reference: FEP 736

Slipper Limpet Density (2006)

Parameter	*Mean*	*Maximum*
No. chains/100m2	70.6	211
No. ind. /m2	3.11	9.3
Potential No. ind. /m2	19	58

Slipper Limpet Stock Biomass

Year	*CEFAS Survey*	*Potential (16% dredge efficiency)*
2004	67t	420t
2005	164t (*84.5t*)	1025t (*528t*)
2006	107t	669t



Management Utilisation Trial

Objective: *to try utilise material with a minimum of cost and keep pace with growth*

Best Case: **10t/yr**
(CEFAS survey with 10% biomass growth rate/yr)

Worst Case: **~200t/yr**
(Potential at ~16% dredge efficiency and 30% biomass growth rate/yr)

Target: *Trial First Year* **25t/yr**

- **Trial Season – A Partnership**

- A) – Oystermen *removal*
- *Oysterman collection 12.5t over Oct-Mar*
  0.5t/week assuming 50kg/boat and x10 boat days/wk

- B) – Harbour Authority *removal + collection*
- *Harbour Authority collection 12.5t over Apr-June*
  1.0t/week assuming 250kg/boat and x4 boat days/wk

- C) – Local scallop processor *shucking*
- D) – Local sports fishing bait supplier *packing freezing for aquarium/bait markets*
- E) – Potting bait production
- F) –Garden centres and specialist technical products *shell related products*

Management

Monitoring

- Population biomass
- Hotspot identification

Treatment Options

- Removal by suction dredge
- Killing by smothering
- Crushing
- **Fishermen Removal**
- **Develop new techniques (e.g. pheromone traps?)**

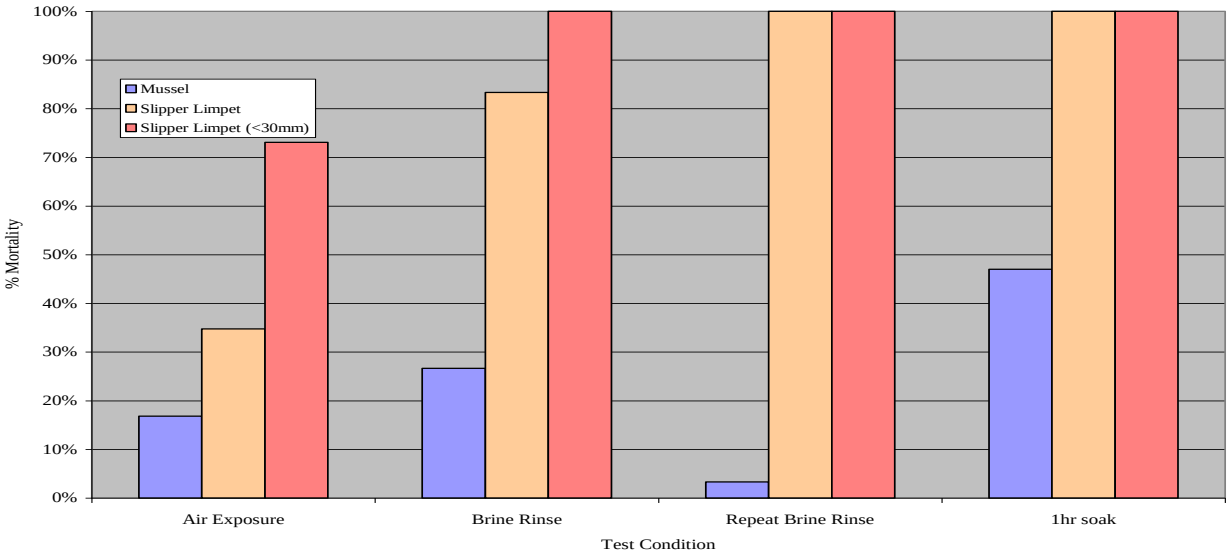
Related Management Issues (for Fal oyster fishery)

- Chain harrowing
- Weed clearing
- Laying of cultch

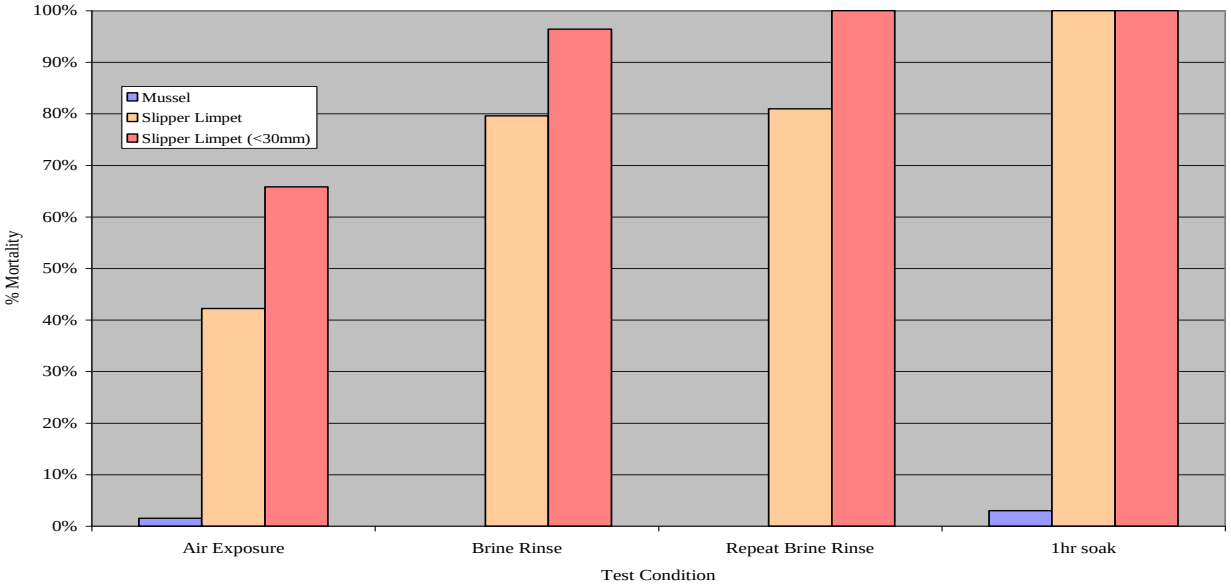
Management Possibilities - Brine Rinsing

SYVRET, M. & FITZGERALD, A., 2008.
SLIPPER LIMPET MORTALITY TRIALS, SEED MUSSEL PROJECT. SEAFISH INNOVATION PRIMER RESEARCH AWARD

Ambient Conditions
Mortality After 3 Days



Chiller Conditions
Mortality After 3 Days



Utilisation Possibilities- Shell

FITZGERALD, A. (2007).
SHELL AGGREGATES REPORT - UK WASTE PRODUCTION. SEAFISH INNOVATION PRIMER RESEARCH AWARD

- Shell
  - Wholesale aggregates
  - **Bagged aggregates**
  - **Specialist aggregates**
  - **Cultch**

Oyster Settlement of slipper limpet shell

Photo: Antony Jensen

Resin Bound Aggregates

From: www.sureset.co.uk

Shell in Waste Water Treatment

Shell Rendering

Utilisation Possibilities- Flesh

- Flesh
  - Animal consumption
  - Human consumption
  - **Aquarium/bait**
  - **Whelk/Crab bait**

Smoked slipper limpets!

Bait Sticks – Scallop in binder & whelk and crab in mussel sock

FITZGERALD, A. (2008).
SHELLFISH FLESH WASTE IN BAIT REPORT. SEAFISH INNOVATION PRIMER RESEARCH AWARD

- The Future?