Spatio-temporal Management Considerations for Hermaphroditic Species in NW Mediterranean

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29% overexploited or collapsed

61% fully exploited

10% underexploited

(FAO, 2014)
Mediterranean Sea

50% of Europe's Small-scale Fisheries (SSF)

SSF decrease

Anthropogenic and environmental impacts are evident and diverse
Costa Brava (NW Mediterranean)
Palamós (NW Mediterranean)

Tourist spot

Cliffs and small bays
Palamós (Small-scale Fishery)
Inhabits coastal waters (26 - 177 m)

High commercial value

Captured by different fishing gear

Landings declining 90’s

Black and Mediterranean seas, E Atlantic, Norway to Angola.

Events of over-exploitation

Common pandora (*Pagellus erythrinus*)
Diandric protogynous hermaphrodite

- Primary Males
- Secondary Males
- Intersexual

[Diagram showing the relationship between male and female reproductive systems]

[Images of anatomical structures labeled with terms such as MMC, OC, RO, ED, etc.]

[Image of a fish]
Management is currently based only on legal sizes (15 cm)

Is this an effective fishery management scheme for this species?

reproductive ecology + effect of the fishery = management recommendations

Assess the vulnerability of *Pagellus erythrinus*, in relation to the activities of small-scale fisheries of Palamós.
Spawning season: April to August (peak May-June)

$L_{50} = 19.3 \pm 1.6 \text{ cm}$

Size Sex Change: $33.3 \pm 2.4 \text{ cm}$

% Sexes: females

Reproductive ecology

Size-frequency distribution

Total length ≠ fM and F, M
Total landings: 62,8t (2002-2011)

Landings December - June (ca. 6,5 t)

Catch by fishing gear:

- Bottom long-line (55.1%)
- Beach seine (31.4%)
- Gillnets (9.8%)
Effect of the fishery

Mode: 18 cm
Mean: 21.5±5.4 cm

Mode: 32 cm
Mean: 32.7±6.9

Mode: 39 cm
Mean: 36.5±5.6

$L_{50} = 19.3 \pm 1.6$ cm

SSC: 33.3 ± 2.4 cm

% Sexes
Effect of the fishery

Breeding season: April to August

Non-breeding season: September to February
Management Recommendations

- Increasing the minimum legal size of capture
- Define temporal and/or spatial closures
GRACIAS

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