



TOWARDS SUSTAINABLE AQUACULTURE IN THE MEDITERRANEAN REGION

CASE STUDIES - innovative solutions for addressing aquaculture challenges in
the Mediterranean and conditions for promoting their capitalization

Environmental challenges

François Simard

IUCN Center for Mediterranean Cooperation

Commission on Ecosystem Management – Ecosystem-based Aquaculture Group

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(10.00-12.00h)



Environmental challenges

- Problèmes au niveau global

Sources des protéines pour les aliments

Fish meal

Trash fish / fish byproducts meal

Other animal proteins (meat industry/ beef / porc/ poultry...)

Vegetal proteins (soja, etc)

Insects

Sea weeds

Sources de lipides

Fish

Seaweed / microalgae

Vegetals (cameline...)





Environmental challenges

- Problèmes au niveau local
 - Pollution matière organique: surcharge aliments, fèces, etc
 - Pollutions diverses: chimique (antifouling), traitement médicaments, déchets
 - Pollutions par échappés et espèces introduites
 - Occupation de l'espace / dégradation des habitats naturels

La plupart de ces problèmes peuvent se régler avec des bonnes pratiques de gestion de l'élevage.

Les solutions sont différentes selon les espèces élevées (poissons, bivalves, algues...)





Environmental challenges

- Aquaculture et conservation du milieu marin
- Synergies et opportunités

Illustrative example of a matrix Aquaculture systems and MPAs categories.
 Any actual version would need to be developed through extensive discussion and dialogue,
 and so accordingly the below table should not be taken to reflect a formal view of IUCN or its Commissions.

Categories	Ia	Ib	II	III	IV	V	VI
High density fish cage culture	N	N	N	N	*	*	*
High density on-land close system fish culture	N	N	N	N	*	*	Y
Medium density on-land circulating system fish pond culture	N	N	N	N	*	Y	Y
High density shell fish culture (table, long-lines)	N	N	N	N	*	*	Y
Low density pond /lagoon fish culture	N	N	N	N	*	Y	Y
High density seaweed culture	N	N	N	N	*	*	Y
Low density shellfish culture	N	N	N	N	*	Y	Y
Medium density invertebrate (e.g. sea cucumber) culture	N	N	N	N	*	Y	Y
Integrated Multi-trophic culture	N	N	N	N	*	Y	Y
Restoration purpose aquaculture *	*	*	*	*	*	Y	Y

- Development of a multiple-use MPA in an existing aquaculture area
- Development of aquaculture farms in multiple-use MPAs
- Joint creation of multiple-use MPAs with aquaculture operations





Environmental challenges

- Benefits and services provided by aquaculture
 - Wild stock fauna enhancement and flora/conservation.
 - Aquaculture designed for fisheries enhancement and proposed as a valid alternative to overfishing on vulnerable stocks.
 - Restocking for fisheries based on aquaculture.
 - Aquaculture can play a major role for food security, poverty alleviation and economic resilience of MPA local communities.
 - Aquaculture is proposed as an alternative to overfishing in a region of great poverty
 - Aquaculture can provide services to coastal ecosystems such as carbon sequestration, nutrient or phytoplankton biomitigation, benthic biodiversity restoration.



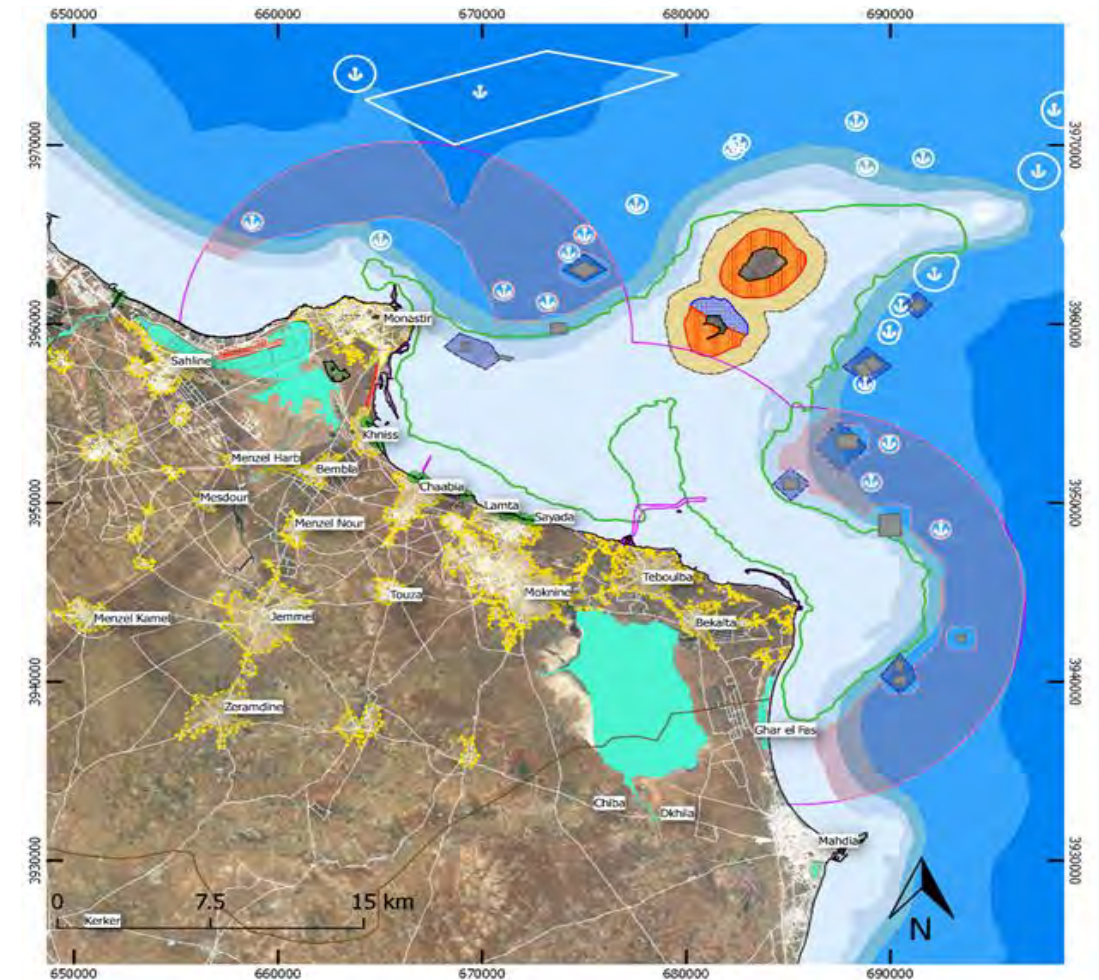
- Exemple Monastir / Kuriat

Elevage de dorades en cage

Aire marine protégée / nidification de tortues / herbiers posidonies

Co-gestion, participation

Intégration locale, emploi, eco-tourisme



Land uses

- administrative boundaries
- Rivers and humid areas
- Urban zones
- Natural parks
- Highway
- Wastewater discharge
- Industrial zones
- Archaeological site
- Touristic beaches

Fisheries and aquaculture

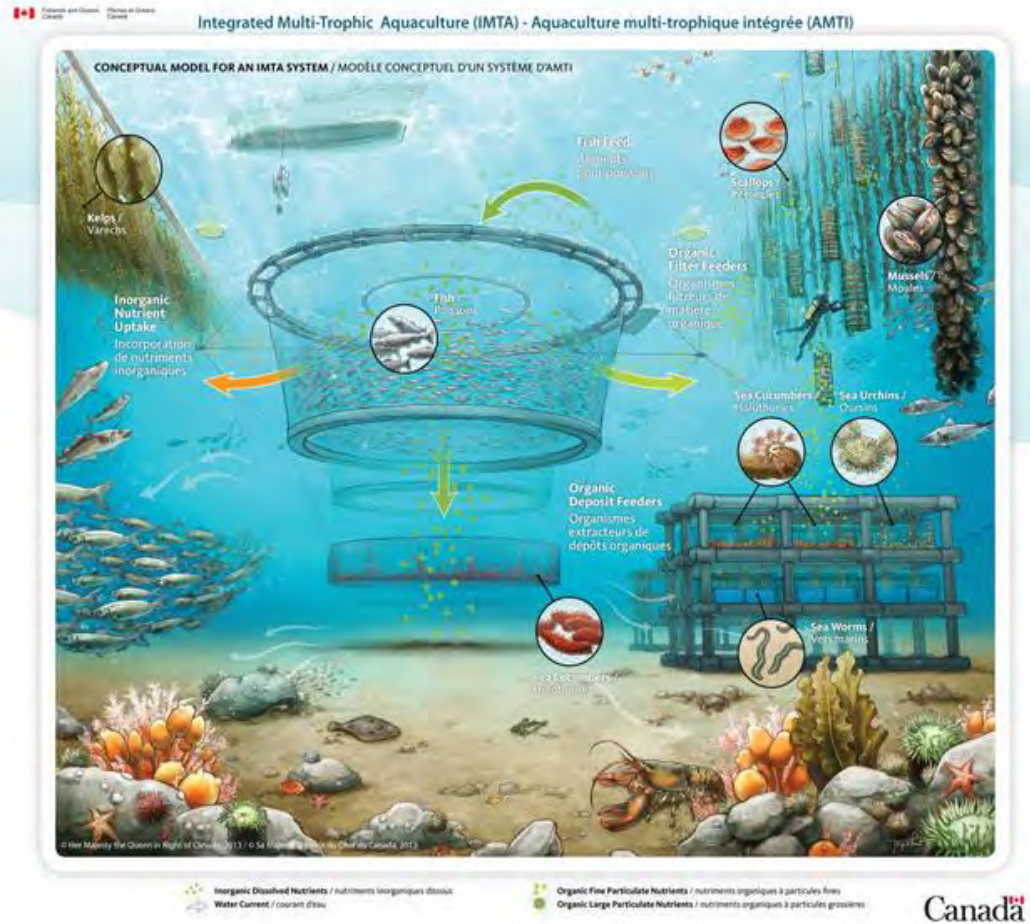
- Beaconing aquaculture area
- Licensing aquaculture area
- Fishing grounds
- 6 nm from port
- Sea routes
- Landing site
- Ports
- AZA
- AZA

Marine protected zone

- Buffer zone
- Multipurpose zone
- Protected zone
- Posidonia meadow
- Bathymetry (m)
- >50
- 30-50
- 25-30
- 20-25
- 0-20



Environmental challenges



• Conclusions

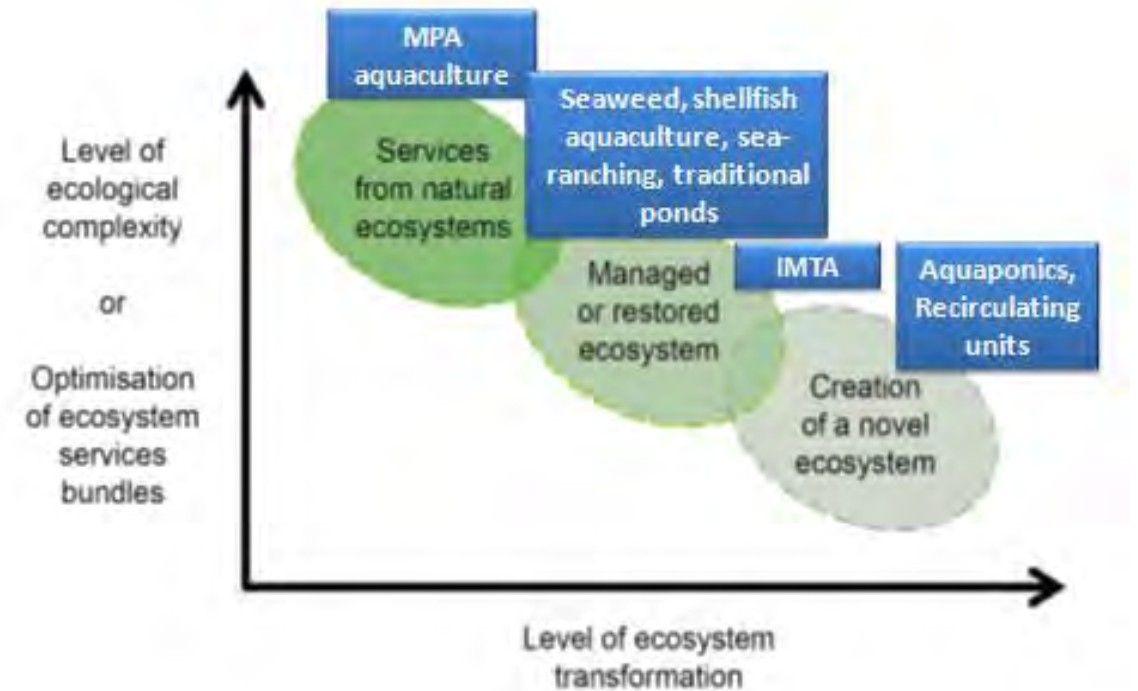
Planification

Diversification

Multitrophique

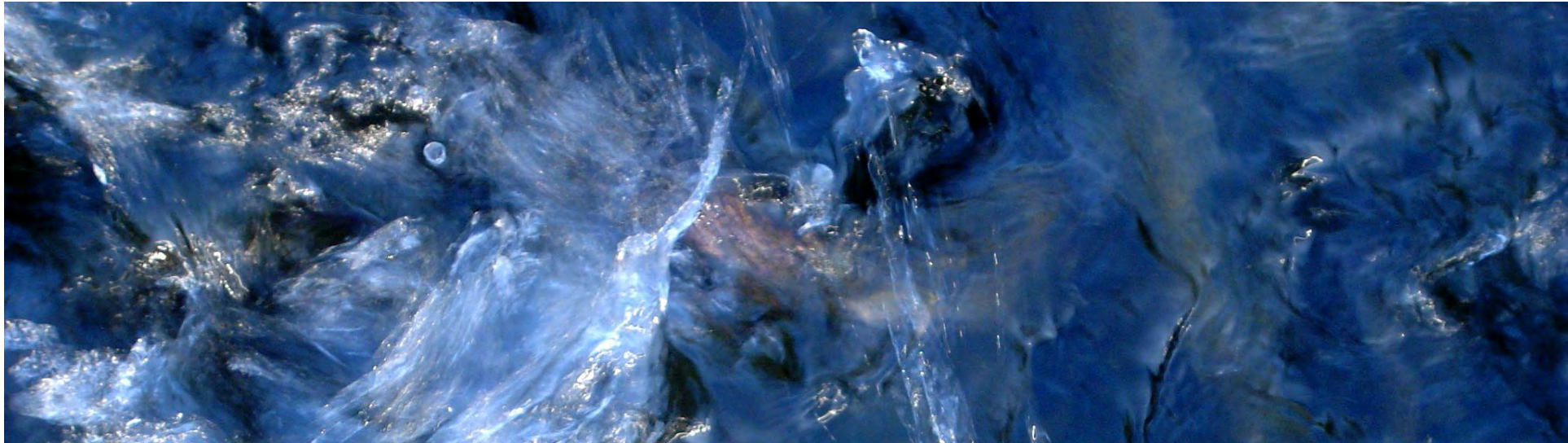
Ecosystem Approach to Aquaculture (EAA)

Nature-based Solution (IUCN Global Standards 2020)



Synergies and mutual benefits between Aquaculture and marine conservation, including MPAs, should be explored on a case by case basis, as a co-construction process between stakeholders.

Merci pour votre attention
Thank you for your attention



www.iucn.org

francois.simard.suisse@gmail.com