

Identification et évaluation économique des services rendus par les habitats coralligènes

Thierry de Ville d'Avray L.^{1,2}, Ami D.², Chenuil A.¹, Aprahamian F.², David R.¹, Féral J.-P.¹

¹ Aix-Marseille Univ, Univ Avignon, CNRS, IRD, IMBE UMR 7263, Marseille, France.

² Aix-Marseille Univ, CNRS, EHESS, Centrale Marseille, AMSE, Marseille France.



OHM

Littoral méditerranéen

Résumé

Par leur grande biodiversité et leur proximité des côtes, les habitats coralligènes fournissent de façon évidente des services aux sociétés humaines. Cette étude a porté sur l'identification de ces services écosystémiques dans une zone d'étude centrée sur Marseille et Port-Cros, et sur l'évaluation économique d'une partie de ces services.

L'identification des services a été réalisée par 43 experts consultés en trois phases : entretiens individuels, questionnaire en ligne et ateliers de discussion. L'évaluation économique a été menée selon la méthode des choix discrets, qui repose sur une enquête en population générale, menée à une échelle pilote (une centaine de répondants). L'application de cette méthode au sujet d'un écosystème peu connu du grand public a permis d'étudier l'impact de l'apport d'informations sur les consentements-à-payer.

Les experts ont identifié 13 services (incluant des fonctions de support) rendus par les habitats coralligènes. Les services suivants ont fait l'objet de l'évaluation économique en population générale : le maintien d'une biodiversité typique du coralligène (valeur d'existence), l'usage durable des ressources et du milieu coralligène par la pêche ou la plongée (valeur d'usage), le potentiel de découverte associé aux espèces (valeur d'option). Nous avons observé que le coralligène est méconnu par 75 % des individus de l'échantillon. Parmi les individus ayant un faible niveau de connaissance sur le coralligène, ceux ayant reçu de l'information pendant l'enquête ont exprimés des consentement-à-payer supérieurs. Les préférences déclarées furent en faveur de la préservation des habitats coralligènes prioritairement par rapport aux usages.

Abstract

According to their biodiversity and their proximity to the coastline, coralligenous habitats obviously provide ecosystem services. This study aimed to identify these services in a study area centered on Marseille and Port-Cros and make an economic evaluation based on population preferences.

The identification of services was carried out by 43 experts consulted through three-phases : individual interviews, online questionnaire and workshops. The economic evaluation was conducted using discrete choice experiment conducted at a pilot scale: about 100 respondents from the local population. The application of this method to an ecosystem that is not well known to the population was an opportunity to study the impact of information on the willingness-to-pay reflecting individual preferences about services provided by coralligenous habitats.

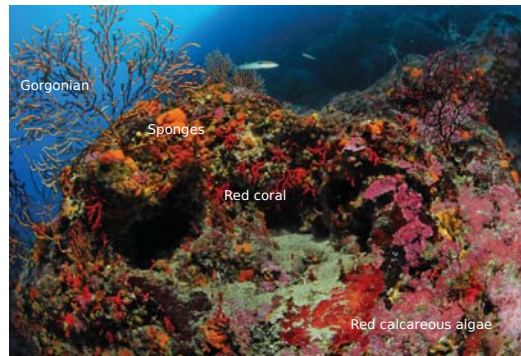
Experts identified 13 services (including supporting functions) provided by coralligenous habitats. The following services have been subjected of the economic evaluation: the maintenance of a typical coralligenous habitats biodiversity (existence value), the sustainable use of resources and environment by fishing or diving (use value), the potential of discovery associated with coralligenous species (option value). We observed that 75% of the respondents had very poor knowledge about coralligenous habitats. Among them, those who received information during the survey expressed higher willingness-to-pay for the conservation of coralligenous habitats and their services. The preferences declared were in favor of the preservation of the coralligenous habitats in priority to the uses.

Identification and economic valuation of ecosystem services provided by coralligenous habitats in Marseille & Port-Cros sites

Thierry de Ville d'Avray Laure***, Ami Dominique**, Aprahamian Frédéric**, Chenuil Anne*, David Romain*, Féral Jean-Pierre*
 * Aix-Marseille Univ, Univ Avignon, CNRS, IRD, IMBE UMR 7263, Marseille, France
 ** Aix-Marseille Univ, CNRS, EHESS, Centrale-Marseille, AMSE, Marseille, France

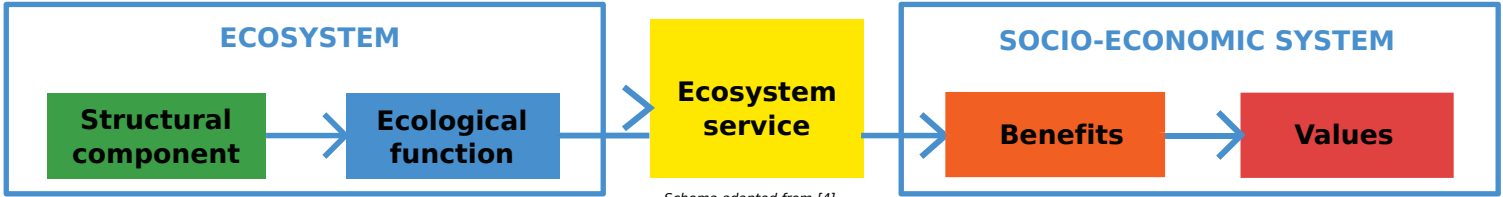


Coralligenous Habitats (CH)
 They are endemic Mediterranean marine coastal habitats mainly made of red calcareous algae. Their complex 3D structure enables the development of communities. Found from 12 to 120 meters of depth, in dim light conditions, where temperature is 13-20°C. With 1700 species associated, coralligenous habitats are a hotspot of biodiversity.



An exemple of coralligenous habitats from Marseille (Photo: Frédéric Zuberer)

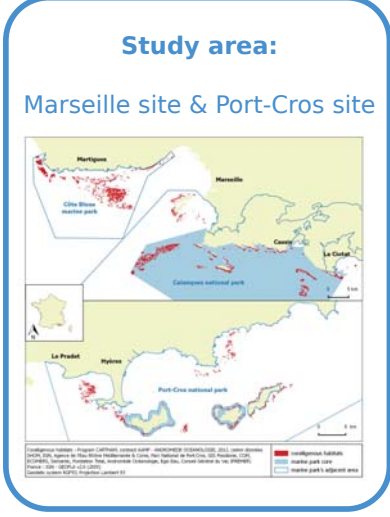
Ecosystem services (ES)
 They are "components of nature directly enjoyed, consumed, or used to yield human well-being" [2]. This concept highlights the dependance of human well-being to ecosystems. From the Millenium Ecosystem Assessment emerged the first common ES classification: supporting, provisioning, regulation, cultural [3]. Later, the category "supporting" does not appear in the classification CICES



Schema adapted from [4]

What are the ES provided by coralligenous habitats in the study area ?

Aim: Identify and describe ES
Method: A survey to collect expert's unpublished knowledge (2015-2016)
 => Interviews, questionnaire, workshops
Participants: 43 experts including 25 for Marseille site & 18 for Port-Cros site.



What are people preferences for ES provided by coralligenous habitats in the study area and how are there impacted by information ?

Aim: Evaluate ES economic value
Method: A (pilot) survey to collect people preferences (2016-2017)
 => Discrete Choice Experiment (DCE) in 3 steps: Quizz on CH, Information on CH given to 50% of the respondents, Preferences (Willingness-to-pay) elicited thanks to 8 choice cards.
Participants: 80/97 respondents

CATEGORIES	SERVICES
Provisionning	Food
	Red coral
	Species for public aquarium
Cultural	Diving site
	Recreational fishing (angling)
	Recreation spearfishing
	Discovery potential
	Inspiration, art
Regulating	Carbon sequestration
	Filtration
	Bio-indicator
	Coast stabilization
Supporting	Habitat, refuge
	Nursery
	Coralligenous typical biodiversity

See on the left the table presenting the result of the survey with experts. See below the legend of the table.

Validated by all experts
Controversial
Refuted by experts

See on the right the information leaflet given to 50% of the respondents. See below one of the 8 choice cards used to elicitate Willingness-to-pay.



CARTE 2	Option A	Option B	Option C (Statu quo)
Qualité du coralligène (habitats et espèces mobiles)	Protection de l'habitat (espèces fixées) et des espèces mobiles	Pas de protection, Risque de dégradation	Pas de protection, Risque de dégradation
Usages (Plongée et ressources)	Favoriser l'activité de pêche	Favoriser l'activité de plongée	Pratique actuelle de la pêche et la plongée
Potentiel de découverte (médecine,...)	Augmentation de la recherche sur les espèces à haut potentiel	Pas de recherche supplémentaire	Pas de recherche supplémentaire
Coût (par ménage/an)	180 €/an soit 15 €/mois	60 €/an soit 5 €/mois	0 €
COCHÉZ VOTRE CHOIX :	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

RESULTS & PERSPECTIVES

- 10 ES validated by the experts out of 15 firstly identified, mostly in the categories of provisionning and cultural.
- There is a lack of scientific knowledge mainly for regulating and supporting ES, and a lack of data to quantify ES.
- The small-scale highlighted the context dependance of the existence of ES and the need to define criteria of existence.
- Among the 80 respondents, preferences were (ranked): (1) to protect coralligenous habitats, (2) to maintain the discovery potential related and (3) to ensure sustainable use (priority given to diving with respect to fishing).
- 75% of the respondents had a very poor knowledge on coralligenous habitats.
- Individuals that received the information leaflet had higher willingness-to-pay.
- The methodologies constructed for this study are original and can be reproduced at small-scale.
- An ongoing study extends the pilot economic survey to a larger sample of individuals living in the same study area.

Bibliography: [1] Ballesteros (2006), "Mediterranean coralligenous assemblages : a synthesis of present knowledge". [2] Boyd and Banzhaf (2007), "What are ecosystem services ? The need for standardized environmental accounting units", in *Ecological Economics*, 63 2-3, p. 616-626. [3] Millenium Ecosystem Assessment (2005) "Ecosystems and human well-being : synthesis". T5, p. 1-100. [4] Haines-Young & Potschin (2010), "The link between biodiversity ecosystem services and human well-being", in *Ecosystem Ecology*, p 31

