



Case Study 5 – Annex

Improving integrated management of Natura 2000 sites in the Ria de Aveiro Natura 2000 site, from catchment to coast, Portugal ¹

¹See full case study report for author and project information. Further information at <u>https://aquacross.eu/content/case-study-5-improving-integrated-management-natura-2000-sites-ria-</u> <u>de-aveiro-natura-2000</u>



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Annex 1- Aggregation of 26 ecosystem services (ES) into 11 types for stakeholders' elicitation purposes. ES classification was adapted from CICES (from Martínez-López et al., STOTEN VSI)

ES type no.	ES type (code)	CICES ES Section	Biologically mediated/ Abiotic outputs of the system	ES Division	ES Group
			biotic		Mechanical Energy
ES1	Biotic based energy sources		biotic	Energy	Biomass Based Energy Sources
ES3	Biotic materials		biotic	Materials	Biomass
FS4	Abiotic materials	Provisioning	abiotic	Abiotic Materials	Non-Metallic
			abiotic	Water	
ES5	Nutritional biotic substances		biotic	Nutrition	Biomass
ES6	Nutritional abiotic substances		abiotic	Nutritional abiotic substances	Mineral
			abiotic		Water
ES7	Mediation of flows		abiotic	Mediation of flows by natural abiotic structures	By Solid Liquid Gaseous Flows
			biotic	Mediation of flows	Gaseous Air Flows
			biotic		Mass Flows
			abiotic		By Natural Chemical Physical Processes
ES8	Mediation of waste toxics and other nuisances		biotic	Mediation of waste toxics and other nuisances	Mediation Biota
	Regulation & Maintenance of physical chemical biological conditions	-	biotic	Mediation Ecosystems Atmospheric Composition Climate Regu- Life Maintenance of physical Maintenance chemical biological Habitat Ger conditions Protection Pest Disease Soil Fo Composition Water Condit	Ecosystems
		Maintenance	biotic		Atmospheric Composition Climate Regulation Life cycle
ES9			biotic		Maintenance Habitat Gene Pool Protection
			biotic		Pest Disease Control
			biotic		Soil Formation Composition
			biotic		Water Conditions
ES10	Physical and intellectual interactions with biota, ecosystems, land and	Cultural	abiotic	Physical and intellectual interactions with land seascapes physical settings	Intellectual Representative Interactions



se:	seascapes environmental settings	abiotic		Physical Experiential Interactions
		biotic	Physical and intellectual interactions with biota ecosystems and land seascapes environmental settings Interactions Interactions	Intellectual Representative Interactions
		biotic		Physical Experiential Interactions
	Spiritual symbolic and other interactions with	biotic	Spiritual symbolic and Other Cultur other interactions with Outputs	Other Cultural Outputs
ES11	biota ecosystems and land seascapes environmental settings	biotic	biota ecosystems and land seascapes environmental settings	Spiritual Emblematic



Annex 2 - Ecosystem cards for stakeholders' workshops





Annex 3 – Summary of available environmental and socio-economic data (data: gathered by AI Lillebø and AI Sousa and published in Newton et al., 2018; source: references therein; complemented with data gathered by A Marhubi; source: PGRH4A, 2016 and Albuquerque 2013).

ES /Abiotic component	Environmental and socio-economic data	
·	Fish and shellfish of commercial interest landed at Aveiro: (2012) 1880 ton/year (clams, cockle, cuttlefish, common sole, seabass) (2013) 1283 ton/year of bivalves (clams, cockle, cuttlefish) (2013)	
Food	In-situ aquaculture farms of marine fish and shellfish: (2012) 35 fish farms (23 active) – 140ton/year (seabass and gilthead seabream) (2012) 24 mollusc/bivalve farms (8.000m2 each) and 32 mollusc/bivalve farms (2000m2 each) (mainly oyste 325 ton/year (japanese oyster, clams, cockle)	
provisioning	Nominal catches: (2014) 15 tonnes of migratory (e.g., the European eel) and freshwater fish; 255 tonnes of crustaceans and from 4,206 tonnes of molluscs, both from marine and transitional waters (2017) Wild Salicornia sold as a gastronomy/gourmet product ≈ 2€/100g (2015) In-situ macroalgae farming ≈ 24 tons (fw)/year ≈ 400tons/ha/year for food and cosmetics	
	Number of licensed boats for fishing: (2013) 574 boats Boating/yatching/waterspots with engine: (2015) 833 boats registered Boating/yatching/waterspots without engine: (2015) 74 boats registered	
Raw materials provisioning	(2012) Bait for fishing ≈36,000 kg yr ⁻¹ (2014) Number of licensed shellfishers and bait diggers 242 (2014)	
Abiotic provisioning	(2014) Salt extraction: 80 tonnes	
Primary production and C stock	Salt marsh plants production ranges from ≈ 350 to 1000g C.m ⁻² .y ⁻¹ Carbon stock in Ria de Aveiro salt marsh plants: 35706 Mg C	
Climate regulation	The average annual temperature at the lagoon area is 14 °C, whilst in Vouga river catchment upper lands the average annual temperature is 9-11 °C.	
Cultural services (supported by ecosystems and abiotic settings)	Tourism N° of bed places: NUTS 2 PT16 – 107297 Tourism accounts for 6% of employment in the Ria region - 71% restaurant/food industry; 12% in hotels and accommodation (of which, in 2011, there are 52 total establishments for lodgings), and the remaining 17% distributed between cultural and recreational activities (e.g. theatre, music, museums, nautical sports, hunting, recreational fishing travel and tours etc.).	
	Visitors of Aveiro Tourism Office: (2015) Total 99523 people (non Portuguese= 91934 people; Portuguese = 7589 people)	



Recreational infrastructures:

Ílhavo municipality -5 recreational quays with 420 moorings; Marina at Torreira: 150 moorings. 10 oceanic beaches and 2 transitional waters beaches, all of them with several infrastructures for outdoor sports related to beach-tourism.

Recreation and nature tourism:

São Jacinto Dunes Natural Reserve: 2 infrastructures for nature-tourism Boat tours (at least 8 including the city channels and the lagoon), walking tours (several options for Aveiro Walk Around), birdwatching (at least six recognised spots: salt pans, Barra, São Jacinto 2, Murtosa, Salreu)

Local festivals related with the lagoon's products and activities:

Festa da Ria summer festival with traditional Moliceiro boats race; Cod fish festival; Eel and ovos moles "soft eggs from Aveiro" food festival; International marine salt festival; FARAV handcraft festival, Lamprey festival, Allis shad (Alosa alosa) festiival). Archeological sites in the lagoon (e.g. shipwrecks, ship hull, and other isolated findings). The traditional architecture (e.g. 'palheiros', 'Gafanhoa'), traditional boats (e.g. 'moliceiro', 'bateira', 'mercantel') and traditional activities (e.g. salt production at the Ecomuseum of Troncalhada saltpans)

Annex 4 - Snapshot of the AquaLinksTool interface.





AQUACROSS PARTNERS

Ecologic Institute (ECOLOGIC) | Germany Leibniz Institute of Freshwater Ecology and Inland Fisheries (FVB-IGB) | Germany Intergovernmental Oceanographic Commission of the United Nations Educational, Scientific and Cultural Organization (IOC-UNESCO) | France Wageningen Marine Research (WMR) | Netherlands University of Natural Resources & Life Sciences, Institute of Hydrobiology and Aquatic Ecosystem Manag (BOKU) | Austria Fundación IMDEA Agua (IMDEA) | Spain Universidade de Aveiro (UAVR) | Portugal ACTeon – Innovation, Policy, Environment (ACTeon) | France University of Liverpool (ULIV) | United Kingdom University College Cork, National University of Ireland (UCC) | Ireland Royal Belgian Institute of Natural Sciences (RBINS) | Belgium Stockholm University, Stockholm Resilience Centre (SU-SRC) | Sweden Danube Delta National Institute for Research & Development (INCDDD) | Romania Eawag – Swiss Federal Institute of Aquatic Science and Technology (EAWAG) | Switzerland International Union for Conservation of Nature (IUCN) | Belgium BC3 Basque Centre for Climate Change (BC3) | Spain

Contact Coordinator Duration

Website Twitter LinkedIn ResearchGate aquacross@ecologic.eu Dr. Manuel Lago, Ecologic Institute L June 2015 to 30 November 2018

http://aquacross.eu/ @AquaBiodiv www.linkedin.com/groups/AQUACROSS-8355424/about https://goo.gl/IcdtZC