

# WP4 - Taller regional sobre servicios de los ecosistemas costeros y marinos del Pacífico Sur

Ciudad de Panamá (PA), 1 y 2 de octubre de 2018

## Breve introducción acerca de los pasos para la implementación del WP4

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Organización de las Naciones Unidas para la Educación, la Ciencia y la Cultura



Comisión Oceanográfica Intergubernamental



Objetivos de Desarrollo Sostenible



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- ANALISIS DE LOS SERVICIOS QUE PROPORCIONAN LOS ECOSISTEMAS

**SERVICIOS ECOSISTÉMICOS:**  
Funciones del ecosistema que proporcionan bienes y servicios (beneficios) a los seres humanos

## OBJETIVO del Taller

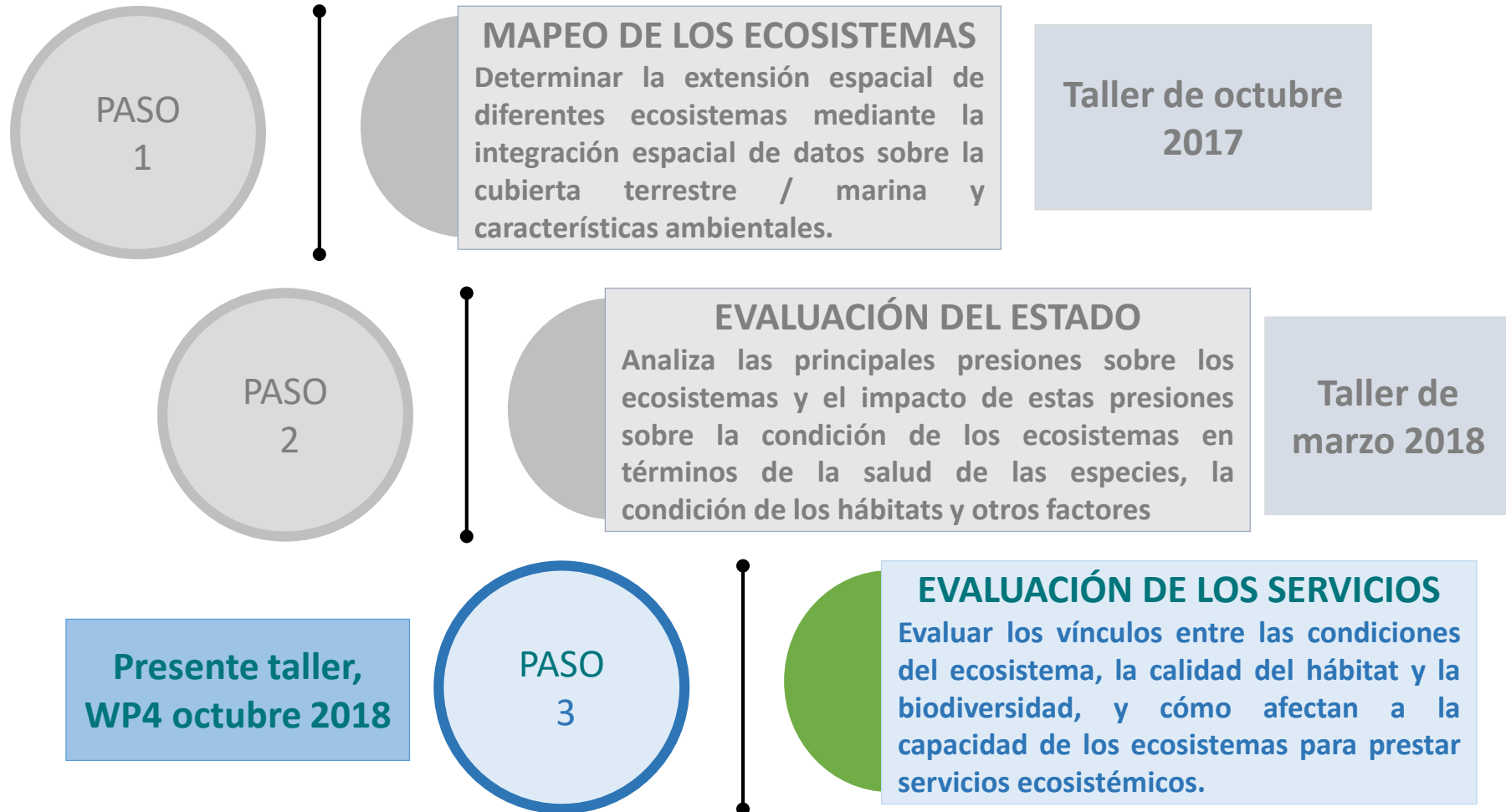


Fuente: WWF



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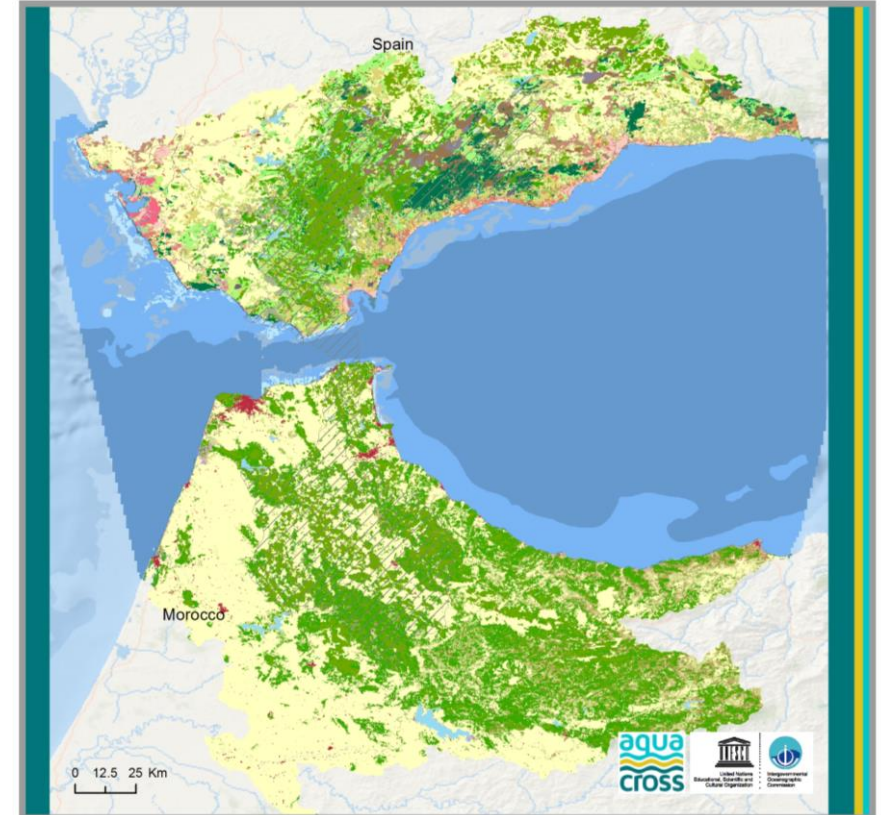
# Evaluación de los servicios ecosistémicos - SPINCAM



## MAPEO DE LOS ECOSISTEMAS

Determinar la extensión espacial de diferentes ecosistemas mediante la integración espacial de datos sobre la cubierta terrestre / marina y características ambientales.

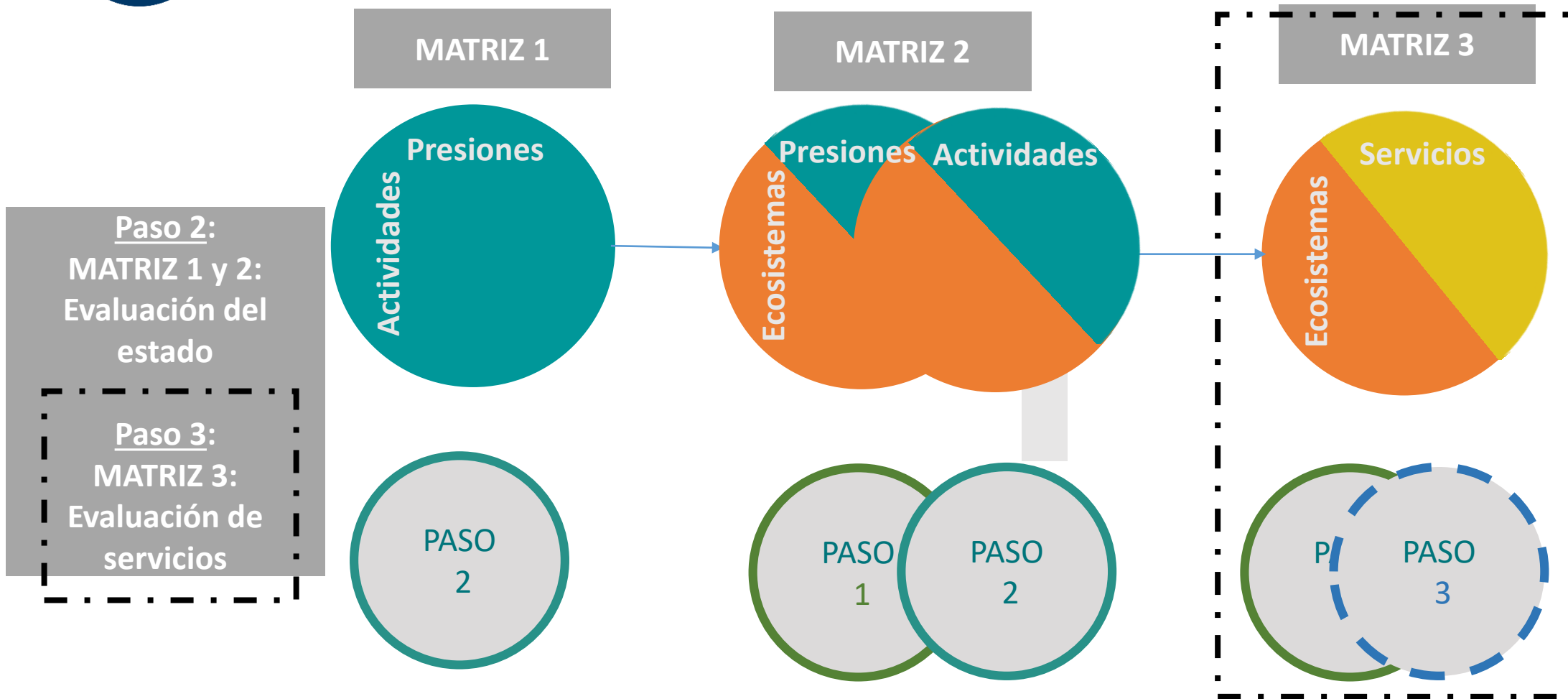
- Cartografiado de hábitats como indicador de la distribución espacial de los ecosistemas.





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# Matrices de vinculación





# Evaluación del estado – MATRIZ 1

**PASO 2**

## Matriz 1: Actividades - Presiones

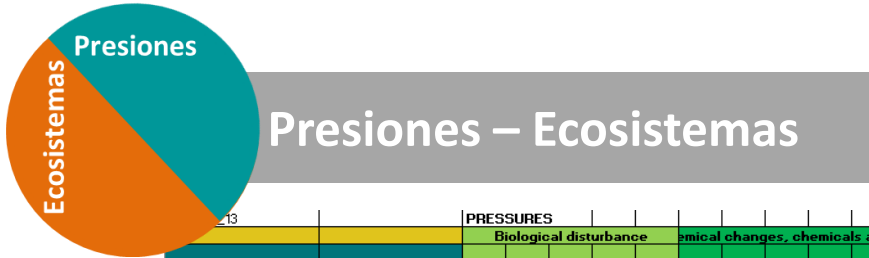
**Actividades**  
**Presiones**

| Primary Activity Type           | Aggregate Primary Activity                                   | Aggregate Code | Specific Primary Activity  | Location  | Presiones                                      |   |   |   |   |
|---------------------------------|--|----------------|--|---|--|---|---|---|---|
|                                 |  |                |  |   | Biological Introduction of Microbial pathogens | Biological Introduction of non-indigenous species | Biological Translocations of species (native or non-) | Biological Extraction of flora and/or fauna | Biological Introduction of genetically modified species |
| Mining, extraction of materials | Mining, extraction of materials: including inorganic, maerl, | Mine           | Rock/Minerals - coastal or land quarrying - extraction of substrate (habitat change) | Riparian  |  |   |   | 1   |   |
| Mining, extraction of materials | Mining, extraction of materials: including inorganic, maerl, | Mine           | Sand/gravel aggregates - extraction of substrate (habitat change,                    | Infralittoral   |  |   |   | 1   |   |
| Mining, extraction of materials | Mining, extraction of materials: including inorganic, maerl, | Mine           | Salt Works (operation)   | Coastal saltmarshes and saline reedbeds                     |  |   |   |   |   |
| Agriculture & Forestry          | Agriculture (crops and livestock)                            | Farm           | General (atmospheric emissions, runoff of nutrients) due to livestock                | riparian and run off into aquatic                           | 1  |   |   |   |   |
| Agriculture & Forestry          | Agriculture (crops and livestock)                            | Farm           | Cultivation of crops and forestry (Irrigation, drainage)                             | riparian and run off into aquatic                           |  |   |   |   |   |
| Agriculture & Forestry          | Forestry   | Forest         | Cultivation of forestry (Irrigation, drainage, change of riparian habitat,           | riparian and run off into aquatic                           |  |   |   |   |   |
| Aquaculture                     | In-situ aquaculture  | Aqua_In        | Fin-fish - set-up (atmospheric emissions for transport of brood                      | Coastal saltmarshes and saline reedbeds; Circalittoral sand |  | 1   |   |   |   |
| Aquaculture                     | In-situ aquaculture  | Aqua_In        | Fin-fish - operational (waste products, anti-fouling, predator control,              | Coastal saltmarshes and saline reedbeds; Circalittoral sand | 1  | 1   | 1   |   | 1   |
| Aquaculture                     | In-situ aquaculture  | Aqua_In        | Shellfish - setup (atmospheric emissions from boats, interaction                     | Coastal saltmarshes and saline reedbeds; Circalittoral sand |  | 1   |   | 1   |   |

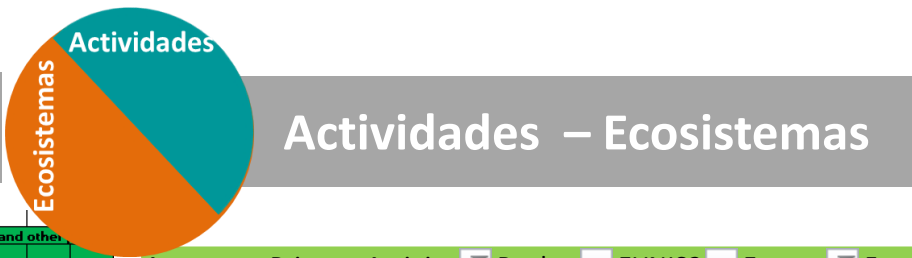


# Evaluación del estado – MATRIZ 2

## Matriz 2: Actividades/ Presiones - Ecosistemas



### Presiones – Ecosistemas



### Actividades – Ecosistemas

| Realms & Biotic Components | Habitats EUNIS 2                               | PRESSURES                           |  |                           |                                       |            |            |             |               |            |            |                       |                       |                       | Aggregate Primary Activity | Realm | EUNIS2              | Extent              | Frequency   |              |    |   |
|----------------------------|--|-------------------------------------|--|---------------------------|---------------------------------------|------------|------------|-------------|---------------|------------|------------|-----------------------|-----------------------|-----------------------|----------------------------|-------|---------------------|---------------------|-------------|--------------|----|---|
|                            |  | Biological disturbance              |  |                           | Chemical changes, chemicals and other |            |            |             |               |            |            |                       |                       |                       |                            |       |                     |                     |             |              |    |   |
|                            |  | Introduction of Microbial pathogens | Introduction of non-indigenous species | Translocations of species | Extraction                            | Excavation | Harvesting | Overfishing | Shallow water | Deep water | Subsidence | Artificial structures | Artificial structures | Artificial structures |                            |       |                     |                     |             |              |    |   |
| Ecosistemas (hábitats)     | A1_Littoral_rock_and_ether_hard_substrate      | C                                   | x                                      |                           | A                                     |            |            |             | C             | C          | C          |                       |                       |                       | C                          | C     | C                   | Beach replenishment | CoastalTe   | B - Coastal  | L  | O |
|                            | A1_Littoral_rock_and_ether_hard_substrate      | C                                   | x                                      |                           | A                                     |            |            |             | C             | C          | C          |                       |                       |                       | C                          | C     | C                   | Beach replenishment | CoastalTe   | B1 Coastal   | L  | O |
|                            | A2_Littoral_sediment                           | C                                   | x                                      |                           | A                                     |            |            |             | C             | C          | C          |                       |                       |                       | C                          | C     | C                   | Beach replenishment | Inlets Trar | A2 Littoral  | L  | R |
|                            | A2_Littoral_sediment                           | C                                   | C                                      | A                         | A                                     | A          |            |             | C             | C          | C          |                       |                       |                       | C                          | C     | C                   | Beach replenishment | Shelf       | A3 Infralitt | EX | R |
|                            | A2_Infralittoral_rock_and_ether_hard_substrate | C                                   | C                                      | A                         | A                                     | A          |            |             | C             | C          | C          |                       |                       |                       | C                          | C     | C                   | Beach replenishment | Shelf       | A4 Circalitt | EX | R |
|                            | A2_Infralittoral_rock_and_ether_hard_substrate | C                                   | C                                      | A                         | A                                     | A          |            |             | C             | C          | C          |                       |                       |                       | C                          | C     | C                   | Beach replenishment | Shelf       | A5 Sublitt   | L  | R |
|                            | A2_Infralittoral_rock_and_ether_hard_substrate | C                                   | C                                      | A                         | A                                     | A          |            |             | C             | C          | C          |                       |                       |                       | C                          | C     | C                   | In-situ aquaculture | Inlets Trar | A2 Littoral  | EX | R |
|                            | A4_Circalittoral_rock_and_ether_hard_substrate | C                                   | C                                      |                           |                                       |            |            |             | C             | C          | C          |                       |                       |                       | C                          | C     | C                   | In-situ aquaculture | Shelf       | A3 Infralitt | EX | O |
|                            | A4_Circalittoral_rock_and_ether_hard_substrate | C                                   | C                                      |                           |                                       |            |            |             | C             | C          | C          |                       |                       |                       | C                          | C     | C                   | In-situ aquaculture | Oceanic     | A6 Deep sea  | EX | R |
|                            | A5_Sublittoral_sediment                        | C                                   | C                                      | A                         | A                                     | A          |            |             | C             | C          | C          |                       |                       |                       | C                          | C     | C                   | In-situ aquaculture | Oceanic     | A7 Pelagic   | EX | R |
|                            | A5_Sublittoral_sediment                        | C                                   | C                                      | A                         | A                                     | A          |            |             | C             | C          | C          |                       |                       |                       | C                          | C     | C                   | In-situ aquaculture | Oceanic     | A7 Pelagic   | EX | R |
|                            | A5_Sublittoral_sediment                        | C                                   | C                                      | A                         | A                                     | A          |            |             | C             | C          | C          |                       |                       |                       | C                          | C     | C                   | In-situ aquaculture | Shelf       | A7 Pelagic   | EX | R |
|                            | A5_Sublittoral_sediment                        | C                                   | C                                      | A                         | A                                     | A          |            |             | C             | C          | C          |                       |                       |                       | C                          | C     | C                   | In-situ aquaculture | Shelf       | A7 Pelagic   | EX | R |
|                            | A6_Deep_sea_bed                                | C                                   | C                                      | A                         | A                                     | A          |            |             | C             | C          | C          |                       |                       |                       | C                          | C     | C                   | In-situ aquaculture | Amphibia    | Amphibia     | EX | R |
|                            | A6_Deep_sea_bed                                | C                                   | C                                      | A                         | A                                     | A          |            |             | C             | C          | C          |                       |                       |                       | C                          | C     | C                   | In-situ aquaculture | Rivers      | C2 Surface   | EX | R |
|                            | A6_Deep_sea_bed                                | C                                   | C                                      | A                         | A                                     | A          |            |             | C             | C          | C          |                       |                       |                       | C                          | C     | C                   | In-situ aquaculture | Fish & Cep  | Fish & Cep   | L  | C |
|                            | A6_Deep_sea_bed                                | C                                   | C                                      | A                         | A                                     | A          |            |             | C             | C          | C          |                       |                       |                       | C                          | C     | C                   | In-situ aquaculture | Inlets Trar | J5 Highly a  | L  | C |
| A7_Pelagic_water_column    | C  | C                                   | A                                      | A                         | A                                     |            |            | C           | C             | C          |            |                       |                       | C                     | C                          | C     | In-situ aquaculture | Mammals             | Mammals     | L            | R  |   |



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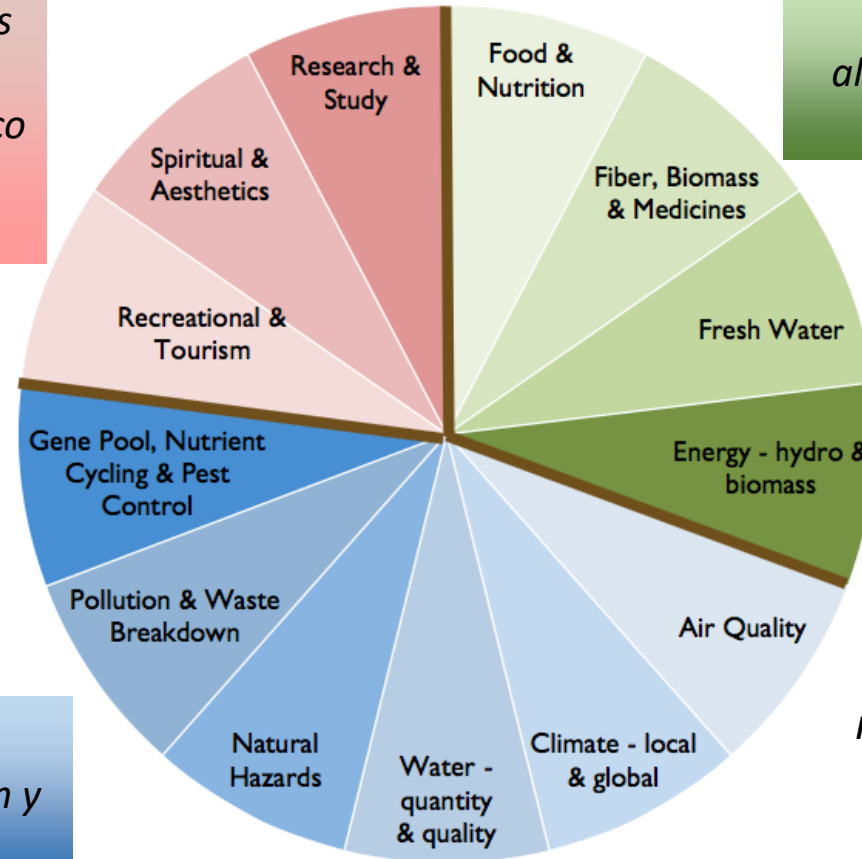
# MATRIZ 3 - Servicios ecosistémicos

Clasificación CICES (Common International Classification of Ecosystem Services); <https://cices.eu/>

**Culturales:** *recursos inmateriales que afectan al estado físico y mental de las personas*

**Abastecimiento:** *alimentos, materiales y energía*

**PASO 3  
WP4**



**Regulación y mantenimiento:** *mediación y moderación del ambiente*

*CICES incluye todos los recursos naturales que la sociedad aprovecha, incluyendo los ecosistemas y los sistemas geo-físicos subyacentes (servicios bióticos de los ecosistemas y productos abióticos).*





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# Evaluación de los servicios ecosistémicos- Matriz 3

**Matriz 3: Matriz de vínculos entre los ecosistemas (hábitats y grupos bióticos móviles) y los servicios ecosistémicos**

**PASO 3  
WP4**

**Ecosistemas**  
**Servicios**

| Habitats EUNIS 2                | Habitats EUNIS 3  | Provisioning                 |                   |           |       |           |       | Regulation - Maintenance                                |                          |                            |               |  |            |                               |               |              |                         |
|---------------------------------|---|------------------------------|-------------------|-----------|-------|-----------|-------|---|--------------------------|----------------------------|---------------|--|------------|-------------------------------|---------------|--------------|-------------------------|
|                                 |   | Energy                       |                   | Materials |       | Nutrition |       | Maintenance of physical chemical biological conditions  |                          |                            |               | Mediation of flows                       |            | Mediation of waste/toxics and |               |              |                         |
|                                 |   | Biomass-based energy sources | Mechanical energy | Biomass   | Water | Biomass   | Water | Lifecycle maintenance, habitat and gene pool protection | Pest and disease control | Soil formation composition | Water conditi | Atmospheric composition a climate regula | Mass flows | Liquid flows                  | Gaseous / air | Mediation by | Mediation by ecosystems |
| A1_Littoral_rock_and_other_hard | Moderate_energy_littoral_rock                             |                              |                   | 1         |       | 1         |       | 1   |                          | 1                          | 1             |  | 1          | 2                             |               | 1            | 1                       |
| A1_Littoral_rock_and_other_hard | low_energy_littoral_rock                                  |                              |                   | 1         |       | 1         |       | 1   |                          | 1                          | 1             |  | 1          | 2                             |               | 1            | 1                       |
| A2_Littoral_sediment            | littoral_coarse_sediment                                  |                              |                   | 1         |       | 1         |       | 2   |                          | 2                          | 2             | 1  | 2          | 2                             |               | 1            | 1                       |
| A2_Littoral_sediment            | coastal_saltmarshes_and_saline beds                       |                              |                   | 1         |       | 2         |       | 2   | 1                        | 2                          | 2             | 2  | 2          | 2                             |               | 2            | 2                       |
| A3_Infralittoral_rock_and_other | atlantic_and_Mediterranean_high_energy_infralittoral_rock |                              |                   | 2         | 1     | 2         | 1     | 2   | 2                        |                            | 2             | 2  |            | 2                             |               | 2            | 2                       |
| A3_Infralittoral_rock_and_other | atlantic_and_Mediterranean_mid-energy_infralittoral_rock  |                              |                   | 2         | 1     | 2         | 1     | 2   | 2                        |                            | 2             | 2  |            | 2                             |               | 2            | 2                       |
| A3_Infralittoral_rock_and_other | atlantic_and_Mediterranean_low energy_infralittoral_rock  |                              |                   | 2         | 1     | 2         | 1     | 2   |                          |                            | 2             | 2  |            | 2                             |               | 2            | 2                       |

**SERVICIOS ECOSISTÉMICOS –CICES-**

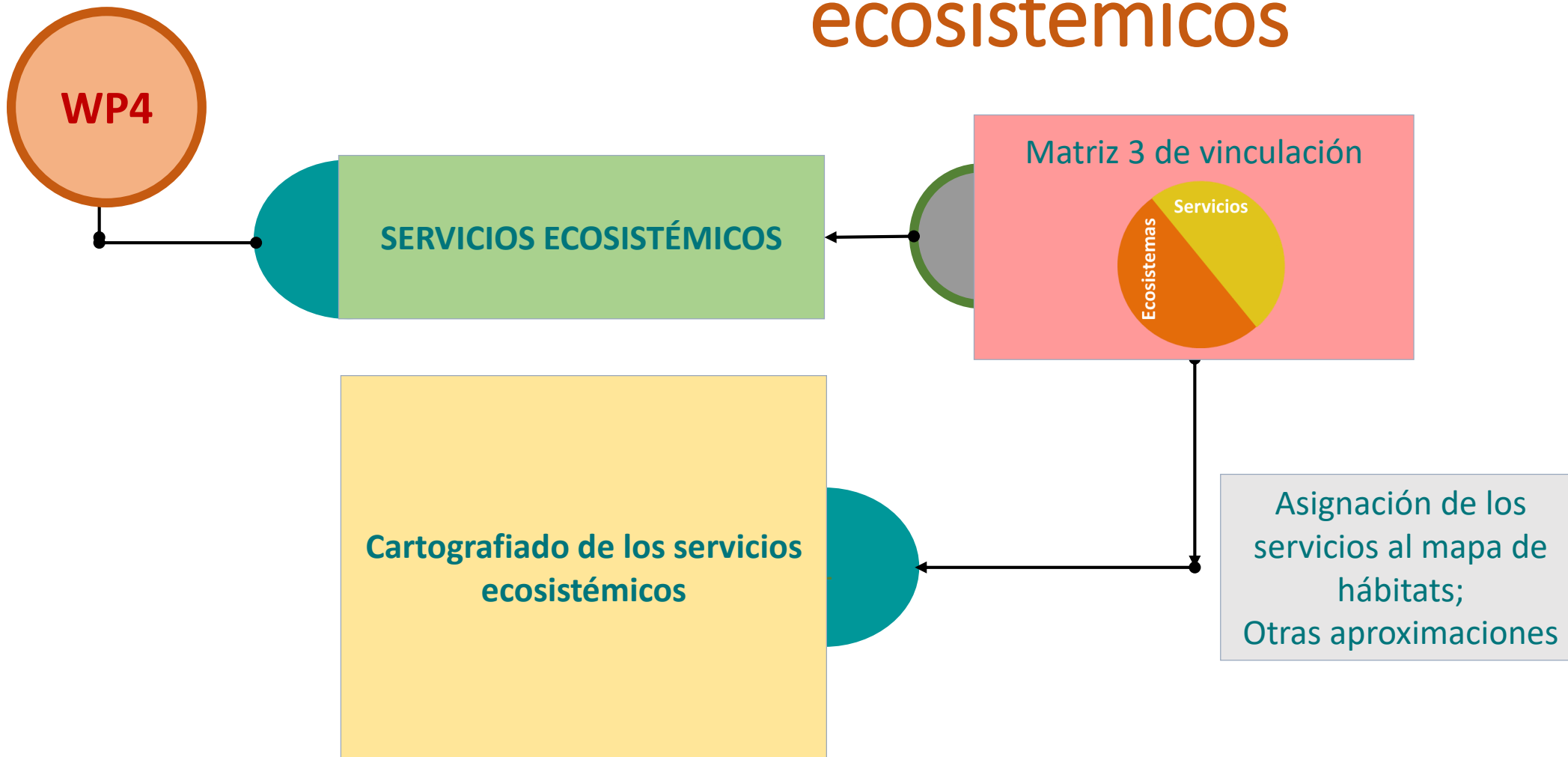
# Consideraciones específicas

- Servicios de los ecosistemas desde la perspectiva de la parte que provee (“supply-side”), es decir, los servicios ecosistémicos producidos con independencia de si son o no usados.
- A la hora de establecer los vínculos se tendrán en cuenta aquellos servicios proporcionados por las comunidades asociadas típicas del hábitat (especies planctónicas, sésiles o sedentarias).
- Como las especies móviles no están asociadas a ningún habitat en particular, o lo están a diferentes habitats a lo largo del ciclo vital, estos grupos bióticos móviles se evaluarán por separado dentro de la matriz.



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# Cartografiado de los servicios ecosistémicos



# Muchas gracias

por su atención

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