

Tunisia Blue Swimming Crab- traps

Fishery Improvement Project

6 Month progress report_July 2025

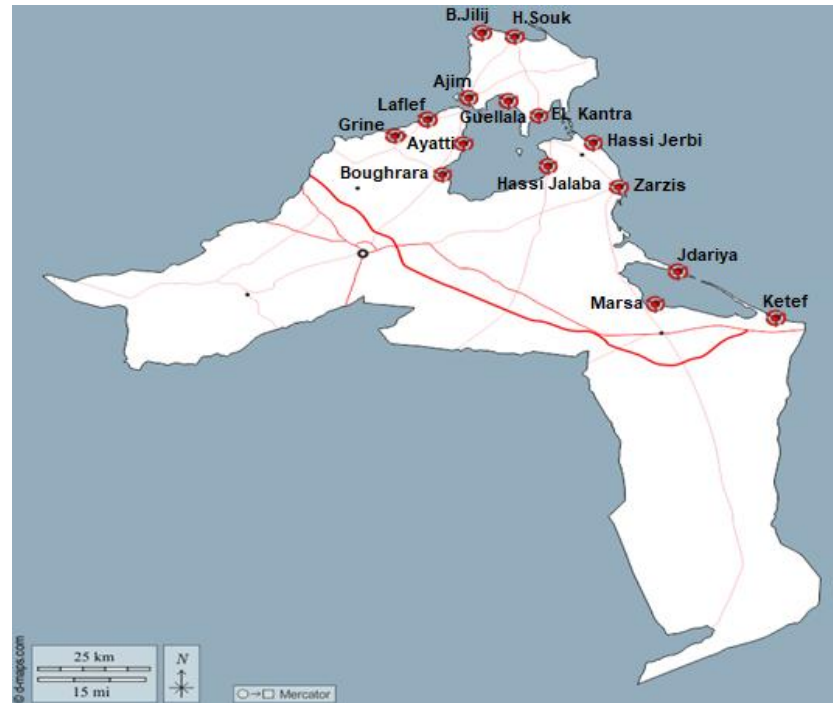
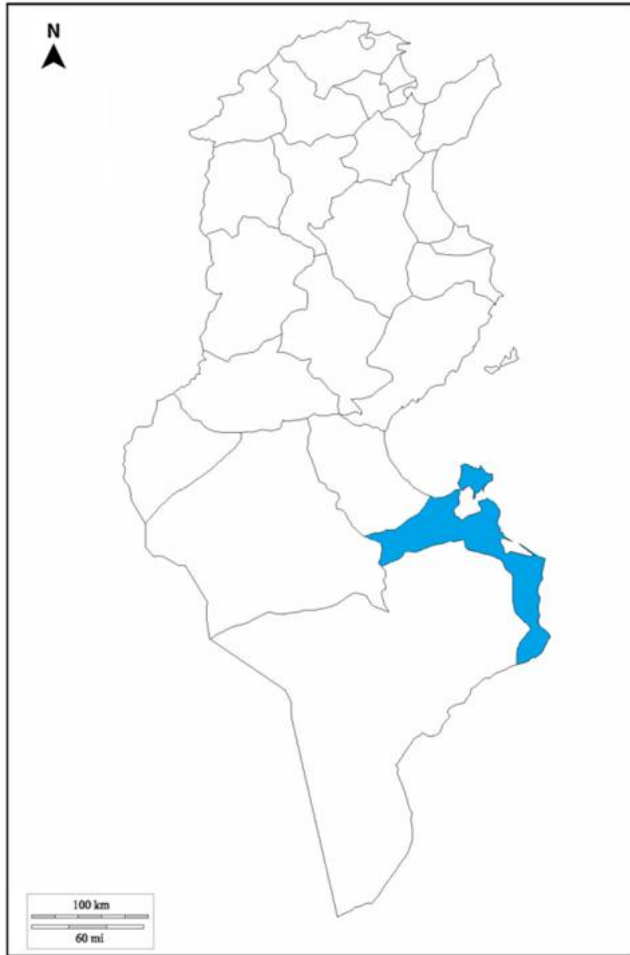


FIP ID: 23622

Author(s):	Dr. Amani Chaffai
Date created	July 25, 2025.
Date updated	July 30, 2025.

1.1. Stock monitoring

Action Name	Define the BSC stock status in the EEZ of Tunisia (Medenine area, Gulf of Gabès).
Goal	Understand the stock level and status through an appropriate stock assessment (at least for three years) that permits implementing management strategies.
Description	To determine the BSC stock status, it is required to implement an appropriate stock evaluation and monitoring program. The lack of relevant information about the BSC fishery in the Gulf of Gabès does not allow enough awareness to verify if the specie is operated in a way that does not lead to overexploitation or depletion of the target populations over time. In such case, obtaining efficient and continuous biological data about the fishery will allow estimating whether the stock status is at a sustainable level or not. The availability of a biological database can be also a reference to support the follow-up of the population invasive behavior and help implementing a strategy to guarantee what is adequate for the fishery. A three month period sampling is implemented in order to record the morphometric measures of the BSC and calculate the Spawning Potential ratio (SPR) which will give an idea about the stock status and help in the monitoring program decision. Moreover, a scientific observer on board will monitor each time the entire fishing operation, from setting traps to hauling and recovering samples to ensure the harvest control rules.
Action Start Date	January 2024.
Expected End Date	December 2026.
July 2025 Update	The Spawning Potential Ratio (SPR) was assessed over a continuous period from January 2024 to June 2025 (quarterly stock assessments via LB-SPR monitoring). Throughout this timeframe, SPR values consistently remained within the reference target range (38%–42%), indicating a generally healthy to moderate reproductive potential of the stock.



Key landing sites and FIP activity areas in Medenine region

Overview

This report presents the results of the Spawning Potential Ratio (SPR) monitoring of the blue swimming crab population *P. segnis* in Medenine area using LB-SPR modeling. The data reflects the reproductive potential of the stock under current fishing pressure, covering six consecutive quarters from January 2024 to June 2025.

Quarterly SPR results

All quarterly values remain within the biological or reference target range (**Table 1**), supporting sustainable fishing practices in the area. The blue swimming crab stock in the Medenine area shows signs of moderate but stable reproductive health, with SPR values aligning well with the target range (38-42%). The stock appears to be sustainably exploited under current fishing pressure, based on quarterly estimates (**Fig. 1**). Quarterly LB-SPR monitoring will be continued to detect any potential deviation from sustainable levels.

- Quarterly SPR range: 39.08%- 41.38%.
- Reference target range: 38%- 42%.

Table 1: Quarterly SPR values compared to biological target range

Period	SPR (%)	Reference target range	Interpretation
Jan-Mar 2024	39.08 %	38%- 42%	Within target range (Moderate)
Apr-Jun 2024	41.01 %	38%- 42%	Within target range (Healthy)
Jul-Sep 2024	40.88 %	38%- 42%	Within target range (Healthy)
Oct-Dec 2024	39.4 %	38%- 42%.	Within target range (Moderate)
Jan-Mar 2025	40.19 %	38%- 42%	Within target range (Healthy)
Apr-Jun 2025	41.38 %	38%- 42%	Within target range (Healthy)

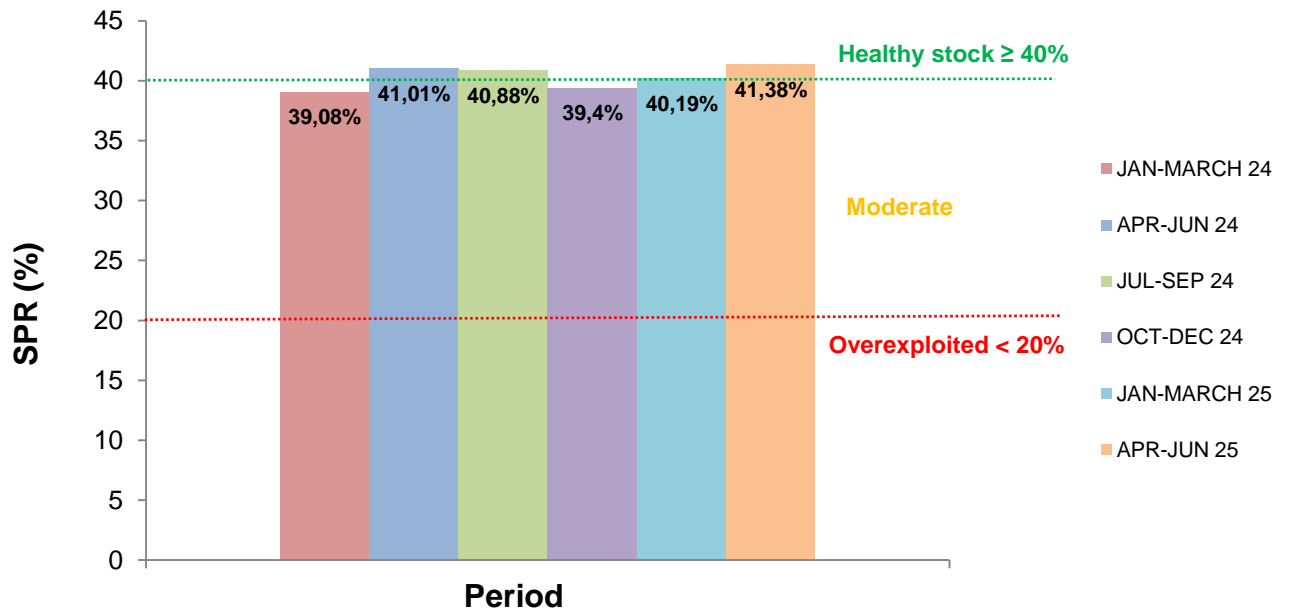


Figure 1: Quarterly SPR percentage of Blue Swimming Crab in Medenine area

Size frequency distribution

The distribution of the blue crab population in Medenine area according to size classes revealed multimodal distributions. This pattern suggests the presence of multiple cohorts within the population which reflects seasonal reproduction and recruitment events, and indicates a population with overlapping age groups (**Fig. 2**).

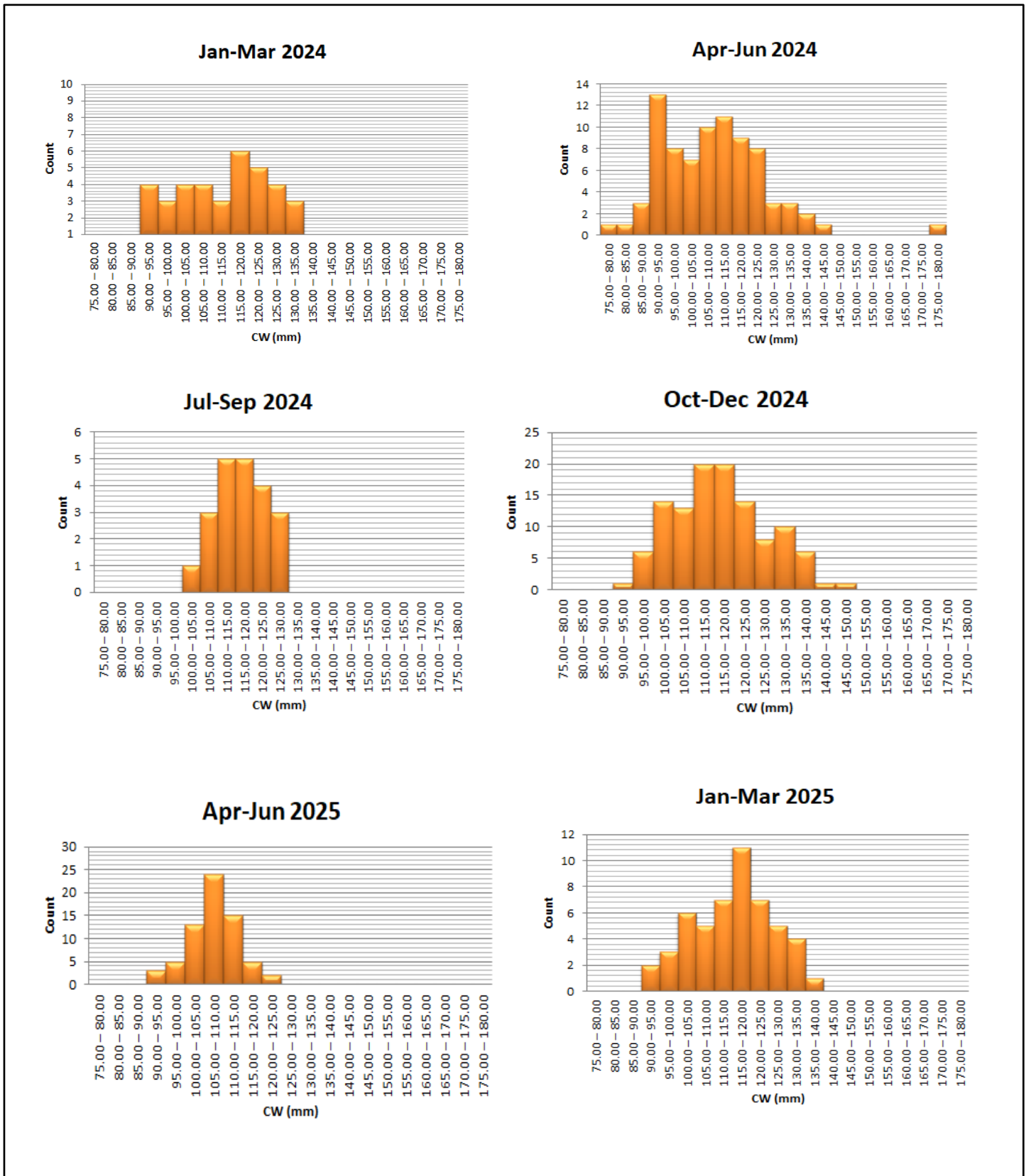


Figure 2: Size frequency distribution of Blue Swimming Crab in Medenine area (JAN 2024-JUN 2025)

Growth Parameters

- $L_{\infty} = 193.82$ mm (5 mm bins).
- $K = 0.94$ year⁻¹.
- $t_0 = -0.62$.

Key growth curve characteristics

The theoretical maximum size that the BSC can reach under ideal conditions is 193.82 mm. The rate at which the crab approaches L_{∞} is $K = 0.94$ year⁻¹ which indicates a rapid growth (typical of short-lived crustaceans) and explosive growth mainly in the first year (steep slope of orange curve in the figure 3). Growth slows significantly after age 1 (curve flattens), approaching L_{∞} asymptotically.

Maturity

- Females (93.8 mm CW) (~4.7 months).
- SPR model: 110 mm CW as maturity threshold.

50% of females are reproductively active at 93.8 mm CW (~4.7 months old) (green dashed line in figure 3). 110 mm ensures crabs survive to ~6–7 months (inferred from growth curve), allowing at least one spawning event. Both maturity thresholds occur during the rapid growth phase (less than one year), far before growth plateaus.

Model Basis

- Natural mortality (M): 0.4364.
- Fishing mortality (F): 0.8.

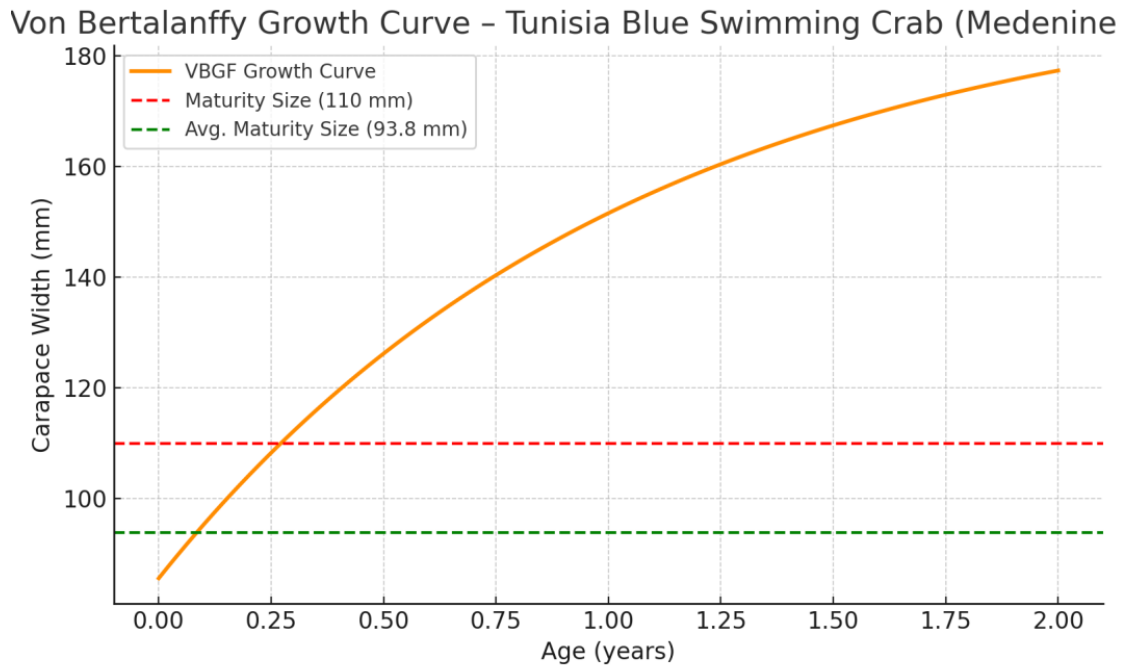


Figure 3: VBG Curve of the BSC in Medenine area

Conclusion

The early maturation of BSC in the Medenine area (at 4.7 months) and its rapid growth ($K = 0.94$) create a management paradox. Although these traits favor rapid recovery, there is no significant risk of overexploitation, particularly under climate change, due to the species' invasive nature and resilience. Thermal performance analysis confirms that in the Mediterranean Sea especially in regions where BSC is already established, the species is likely to persist long-term (through 2050). Additionally, projections indicate future expansion along the coasts of Spain, France, Italy, and Greece, particularly in the Aegean Sea.

Despite being an invasive species, *Portunus segnis* from the Gulf of Gabès (Medenine area) exhibits moderate natural mortality ($M = 0.4364$) and sustains an SPR within the target range (38–42%) under fishing mortality of $F = 0.8$. These results suggest that current fishing pressure is effectively balancing ecological control and commercial exploitation, supporting both ecosystem resilience and industry sustainability. In our case, SPR is a good tool to balance fishery sustainability with population control. Our current SPR (~39–41%) means that the BSC population is exploited but not crashing which may ensure the long-term commercial exploitation while keeping the invasive population in check to reduce ecological harm. Biological resilience of invasive species mainly crabs (fast growth, early maturity, high fecundity) helps it maintain a viable population despite exploitation. The BSC in Medenine area is adapted to recover quickly.

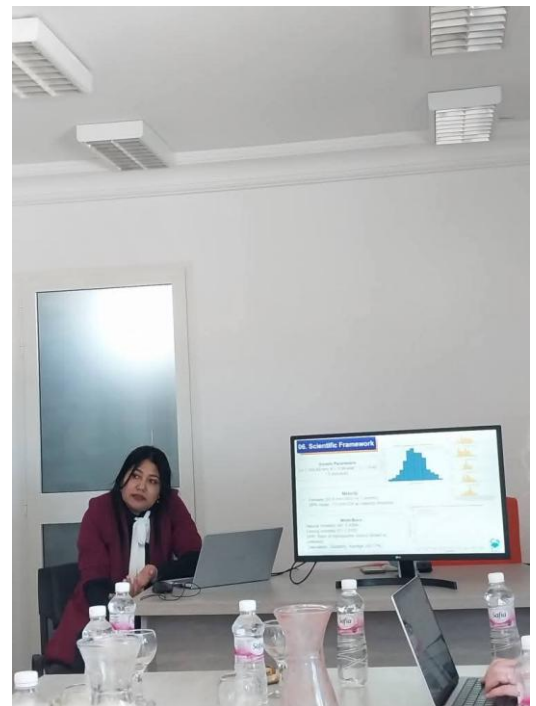
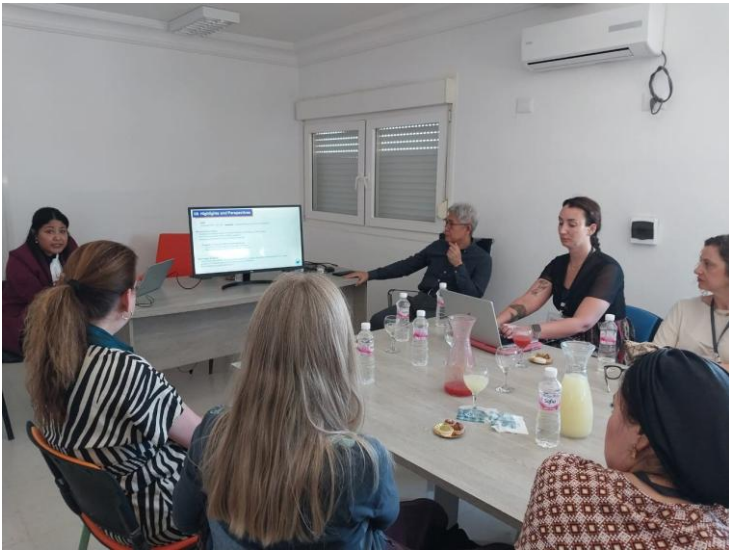
1.2. Environmental progress

Action Name	Assess the ecological and environmental impacts of the BSC fishery in Medenine area (Gulf of Gabès).
Goal	Bycatch and interactions with habitat and protected species are quantified, and management measures are implemented to reduce the impacts of fishing if necessary.
Description	The coastal artisanal fleets from the Gulf of Gabès use mainly traps or cages. It is believed likely that the fishery generates amounts of bycatch, or interactions with secondary species, or vulnerable habitats. Therefore, data is needed to identify and quantify these interactions. Moreover, the ghost traps pose a unique set of issues for the ecosystem. In this context, we will work on making specific traps that detach automatically after a certain time to release non-target species.
Action Start Date	January 2027.
Expected End Date	December 2027.
July 2025 Update	<p>As part of our environmental workplan, we will begin assessing the ecological and environmental impacts of the BSC fishery in the Medenine area (Gulf of Gabès) starting in January 2027. This assessment will include quantifying the interactions of bycatch with habitats and protected species, as well as implementing management measures to reduce the environmental impacts of fishing.</p> <p>In the meantime, we have already initiated the development of a data collection schedule to gather information on the harvest of secondary species, the presence of ETP (Endangered, Threatened, and Protected) species, and the issue of ghost traps, which pose a unique threat to the ecosystem. Additionally, we have started designing a prototype ecological trap that can automatically detach to release non-target species, aiming to minimize unintended ecological impacts.</p> <div style="text-align: center;"> </div>

1.3. Management actions

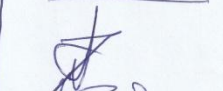
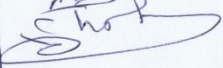
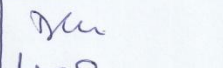
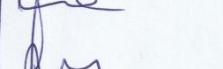

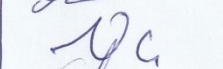







Action Name	Develop effective and/or specific management actions.
Goal	Ensure the long-term health and sustainability of the stock.
Description	There is no efficient management plan for the BSC in the Gulf of Gabès which is the most important state of the fishery. A harvest control rule need to be implemented (biological rest law, interdiction of buying BSC from trawl fleets...). We will work along with the decision makers on the implementation of national law and/or regulation that makes the BSC reaching a maximum sustainability level.
Action Start Date	January 2024.
Expected End Date	December 2028.
July 2025 Update	<p>In addition to previous reported participation in national meetings and conferences alongside key stakeholders and decision-makers (September 15-17, 2023: XIXth Tunisian days of Marine Science “The paradox of blue crabs between ecosystem impacts and investment opportunities”; March 5-7, 2024: Scientific Biodiversity Days “Exploring the opportunities of invasive species”; January 8-9, 2025: The National Symposium on the development of Exports (Fishery and Aquaculture products) “Export development of Fishery and Aquaculture products”, in April 2025, two key meetings were held. The first took place at the CNSS (National Social Security Fund) in the presence of representatives from the government, fishery department, GUMP, FAO, Monterey Bay Aquarium, Seafood Watch, and GIPP. The objective was to evaluate the social conditions of fishers and to collaborate with FAO in developing strategies to support those working in the BSC sector, particularly in light of the challenges posed by the invasive nature of the species.</p> <p>The second meeting was held at GUMP headquarter, where the progress of the Fishery Improvement Project was presented. Discussions focused on management measures aimed at controlling the population of the species and ensuring its conservation, while safeguarding the broader ecosystem.</p>





25/04/2025, 12^h 30 Meeting GUMP/FAO/MBA, Zargis

Attending list

<u>Name</u>	<u>Institution</u>	<u>Signature</u>
- AKKARI Manahel	FAO/Tunisia	
- Chokri Zairi	MARKP/DCI	
- Daniela Kalikoski	FAO	
- Weng Noreh	Monte Bay Aquaria	
- Fiona Mulligan	Monte Bay Aquarium	
- Mäsiqä Eandler	Monte Bay Aquaria	
- VALERIO CRESPI	FAO-UN, ROME	
- LUCA CERIOIA	FAO-UN, MEDSUDRES	
- MALOUFI Felhi	GIPP Mademie	
- Hamed Bechrir	GUMP, Mademie	
- Naloufi Abdelaziz	GUMP	
- Amami Chad Jai	GUMP (Zargis Mademie)	
- Ken Choi	GUMP	

Illustrative photos and attendance record (April 25, 2025)

1.4. Social Activities

Action Name	Directing the coastal artisanal BSC fishery in Tunisia towards the well-being of the communities.
Goal	Improve the well-being of local communities.
Description	The current FIP aims to support coastal artisanal vessels through improving their operations (quality, management, sanitary processes, traceability, certifications, etc.) and make investments towards human consumption supply chains. There is a need to improve safety conditions for fishermen through the use of communication tools, appropriate GPS systems to facilitate access to fishing gear.
Action Start Date	January 2025.
Expected End Date	December 2028.
July 2025 Update	<p>From August to December 2024, socio-economic surveys were conducted across all fishing ports and major landing sites in the Medenine region as preliminary assessment. A total of 100 fishers were interviewed, including 11 vessel owners and 89 operators, with ages ranging from 20 to 60 years. The surveys aimed to assess livelihood conditions, working practices, and community needs.</p> <p>In parallel, social workshops were organized to raise awareness of fishers' social rights, promote ethical labor practices, and enhance occupational safety. These activities laid the foundation for broader social responsibility efforts planned for 2025.</p> <p>In 2025, the implementation of a code of conduct focused on ethical labor and safety standards was introduced. Community training sessions and multi-stakeholder engagement activities were also launched to strengthen compliance and foster a culture of responsibility within the sector.</p>

Note: All social activities, meeting minutes and workshop outcomes will be detailed in the social report, in accordance with the new Fishery Progress (FP) social reporting requirements. Below are examples of selected social actions, including photos and attendance records.





المنان والتاريخ: 31 ماي 2025

قائمة الحضور

التوقيع	رقم الهاتف	الوظيفة	الاسم واللقب
	55042509	مديرة	فدوى المدني
	84831847	معلم	الطبيب القنطاري
	54606667	معلم	عبد الحامد
	86826389	معلم	عبد العزيز المصالي
	54829096	معلم	عبد القادر
	82733650	معلم	صالح العرفان
	82487348	معلم	وليد جاسم
	8800118	معلم	عبد الحامد
	85743821	معلم	الانصر الحاج
	51447524	معلم	سليم بن الحاج
	90251630	معلم	دكتور مرام
	93544258	معلم	بشير المسحال
	98550718	معلم	فصل حدي

Documentation of social activity: illustrative photos and attendance record (May 31, 2025)





المكان/ التاريخ: آجيم 19 جويلية 2025

قائمة الحضور

الإمضاء	رقم الهاتف	الوظيفة	الاسم واللقب
	98 552 693	مجهز	1 بلقاسم الشاذلي
	56 358 044	مجهز	2 حسين الشهب
	99 493 142	مجهز	3 مولدي العيسين
	99 886 173	مجهز	4 فتحي بن خليفة
	20 619 065	مجهز	5 جمال العيسين
	98 601 490	دنيا مفع	6 حكيم فريغ
	50 366 855	مفتوح	7 بشير السريحي
	97 202 473	مجهز	8 منير عوجان
	50 200 178	مجهز	9 طاهر ملمان
		بايع	10 مجيد الصديقي
	93.114.142	مجهز	11 منير جويلي
	972.02135	مجهز	12 منتصر كورني
	972.02135	مجهز	13 صموئيل الفينكي
	97 37 6717	مجهز	14 وليد المليلوكي
	23505381	مجهز	15 محمد العبدوي
	99 893 134	مجهز	16 فتحي الراعي
	50 1186 1180	مجهز	17 نجيب جومر

الإمضاء	رقم الهاتف	الوظيفة	الاسم واللقب
	55 379 677	مجهز	18 أممي العياي
	96 250 843	مجهز	19 رموان دعفاي
	97 338 021	مجهز	20 نور الدين القلايغ
	98 566 928	مجهز	21 فتحي التالوني
	55 04 2509	مفتوح	22 جمال دعفاي
	58 223 419	مفتوح	23 وليد الجولاي
	59 050 018	مفتوح	24 رحمان سبيغ
	52 382 101	مجهز	25
			26
			27
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			29
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Documentation of social activity: illustrative photos and attendance record (July 19, 2025)