Small Grants – Final Completion and Impact Report

Instructions: CEPF requires that each grantee report on project results and impacts at the end of their grant. To monitor CEPF's global indicators, CEPF will aggregate the data that you submit with data from other grantees, to determine the overall impact of CEPF investment. The aggregated results of all grantees will be reported on in our annual impact report and other communications materials. Your Final Completion and Impact Report will be posted on the CEPF website.

Ensure that the information provided pertains to the entire project, from start date to project end date.

Please complete all fields and respond to all questions listed below.

Organization Legal Name: *Difaf SAL*
Project Title: *Develop an Integrated Management Plan for Damour River Basin - Lebanon*
Grant Number: 112343
Date of Completion of this Report: 30/06/2022
CEPF Hotspot: Mediterranean Basin
Strategic Direction:
SD2: Support the sustainable management of water catchments through integrated approaches for the conservation of threatened freshwater biodiversity.

PI 2.1 "Enhance the knowledge base on freshwater biodiversity and the importance of freshwater ecosystem services", and 2.3 "Engage with government, private sector and other stakeholders to support integrated river basin management practices that reduce threats to biodiversity in priority catchment management zones".

Grant Amount: $24,375.96
Project Dates: June 2021-**May 2022**

PART I: Overview

1. **Implementation Partners for this Project** ***(list each partner and explain how they were involved in the project)***

    1. **Municipalities, Mayors and Socio-Political Experts**: During the initial preparatory phase, municipalities and mayors of the target area were interviewed to define access points to the river, ongoing threats and pollution sources, as well as general logistic support. Municipalities have shown interest and commitment to protect the river basin and interviews helped understand their expectations and priorities. Only one municipality was not very cooperative, refusing to provide information on some pollution sources (farms / industries). As for the socio-

political expert interviewed and consulted occasionally during the project, he helped us understand the culture and background of the main villages near the river and provided contacts for key people in the area and municipalities.

2. Experts from Shouf Biosphere Reserve, Lebanese Reforestation Initiative (LRI), External Local Experts: Interviews with researchers and academics helped us understand technical and scientific contexts, design our methodologies, refine our project approach, evaluate results and propose recommendations. The interviewees reinforced the project aim and objectives for the impact it has on providing scientific-based evidence and stakeholder engagement for effective conservation action.

Generally, the involvement of (1) and (2) implementation partners have facilitated the project at its different stages. In fact, it has yielded valuable information and insights on status of the Damour River, including water use, threats and pollution sources, as well as contacts that were influential and helpful upon project implementation and coordination activities.

2. Summarize the overall results of your project

The project has elaborated a detailed biological assessment highlighting ecological value of the Damour River, which has been disseminated across involved stakeholders to gain buy-in and support for planned conservation plans.

A baseline data was prepared by performing analysis on water quantity and quality through sampling and profiling studies, biodiversity mapping and baseline assessment of both terrestrial and aquatic species, mapping of point and non-point source pollution and pressures which threaten habitats and biodiversity, assessing hydromorphic, hydrographic, and hydrogeological information, as well as identifying water management issues and local development plans for the area.

Main biodiversity assessment findings (Annex 1)

- **Ten sites were selected for flora assessment**, riparian habitat quality assessment (QBR) and the scoring of the Index of Potential Biodiversity (IBP). Both indices were compared with each other and with the results of the flora richness, for cross-validation
- **The field visit yielded 110 identified species**, in addition to several species that remained unidentified. This is mainly due to the short assignment period, and the impossibility to have a whole season to collect inflorescences and seeds for species identification.
- **Out of the 110 species identified, two species are under the IUCN red list of threatened species**: Arum hygrophilum (NT) and Platanus orientalis (VU). Both are related to riparian vegetation. Many others are currently under national assessment and could be potentially threatened.
- **In terms of degree of endemism, there were one species endemic to Lebanon** (Papaver umbonatum), three endemic to two countries (Allium zebdanense, Papaver subpiriforme, Trifolium plebeium), and two others to three countries (Erysimum gonyocaulon, Euphorbia berythea).

Advanced studies using eDNA shows that a total of 27 vertebrate taxa were detected with 44.4% (12 taxa) were at least 99% similar to a species in the global reference databases, a total of 4 unique fish, 6 amphibians, 1 reptile, 13 birds and 3 mammals were detected. The taxa belong to 9 orders, 19 families, and 21 genera. Species of note include European eel (*Anguilla anguilla -CR*), and Mediterranean spur-thighed tortoise (*Testudo graeca - VU*). Among the most commonly detected species were marsh frog (*Pelophylax ridibundus*) and Mesopotamian barb (*Capoeta damascina*) which endemic to Lebanon.

332 macroinvertebrates taxa were detected of which 3.9% (13 taxa) were at least 99% similar to a species in the global reference databases. Among the most commonly detected species were *Baetis pacis, Dasyphora cyanella and Gammarus italicus.*

Social aspect. (Annex 5)

Key Informant Interviews (KII) with targeted municipalities: Qualitative data obtained revealed that most local authorities identify the lack of law enforcement as the main problem for managing the river basin and stopping the continuous violations. Another cause, in their opinion, is the lack of human and financial capacity of local municipalities to implement and follow-up on needed actions/interventions.

Integrated management plan for Damour River

Because of the delay a charter (Annex-9) was prepared and shared with relevant stakeholders. It is the first step to engage them in preparing the integrated management plan after the project using produced date. It was prepared and discussed with all stakeholders with relevant stakeholders mentioned above especially the municipalities. The charter includes 4 objectives: i) public awareness; ii) improve policies and law application; iii) support sustainable activities and vi) biodiversity conservation.

The management plan has been delayed because of gathering data took more time than expected. Covid 19 and political situation in Lebanon impacted the progress of the project.

3. Briefly describe actual progress towards each planned long-term and short-term impact (as stated in the approved proposal)

a. Planned Long-term Impacts - 3+ years[1]

Impact Description	Impact Summary
The biodiversity assessment will provide baseline information to better inform decision makers on integrating biodiversity in development plans.	The IBP final score which includes two scores one for the population and management of the site, and another for the context showed that most of the lower factors are related to the management rather than the context. This finding is very crucial for any development plans because several aspects of effective riparian zone management could enhance the capacity to host biodiversity and

[1] As stated in the approved proposal

	therefore be of benefit socially, economically for the local community and the zone itself.
Conservation recommendations will contribute significantly to balance the freshwater use for consumption and ensuring water flow for a healthy functioning freshwater ecosystem.	Integrated river basin management plan, based on conservation recommendations, for the Damour River will address the following: ● Prevent further deterioration and protect and enhance the status of riparian ecosystems ● Promote the sustainable consumption of water ● Reduce pollution of waters from priority substances and phasing out of priority hazardous substances ● Prevent the deterioration of the status and to progressively reduce pollution of groundwater ● Contribute to mitigating the treats affecting the Damour River
Stakeholders' engagement and collaboration will influence national development strategies to consider biodiversity conservation.	The stakeholders' engagement in preserving the Damour River basin will lead to effective collaboration between the different stakeholders in the watershed industry: communities, environmental organizations and government. Mainstreaming project findings, that relate to biodiversity and its interaction with the socio-economic status of the surrounding communities and development projects, across government authorities and key influential figures will push towards adopting those assessments and needs in future national development strategies

b. Planned Short-Term Impacts - 1 To 3 Years [2]

Impact Description	Impact Summary
Water and biodiversity baseline data with threat analysis for the targeted upstream area of Damour River covering around 130 Km^2 of KBA Nahr ed-Damour will be established, and the scientific information will reach academic research and scientific circles. Detailed analysis of threats to water quality and quantity and associated biodiversity. Such analysis will guide future conservation planning.	Interviews with researchers, academics and the local community have helped us draw the assessments needed for the ecological value of the River. A baseline data was prepared by performing analysis on water quantity and quality through sampling and profiling studies, biodiversity mapping and baseline assessment of both terrestrial and aquatic species, mapping of point and nonpoint source pollution and pressures which threaten habitats and biodiversity, assessing hydromorphic, hydrographic, and hydrogeological information, as well as identifying water management issues and local development plans for the area.
At least 60 % of the main stakeholders (local authorities, civil society, farmers, industries, cooperatives, institutions) will be reached for awareness raising and representatives engaged in a process for producing a draft charter of better water resource management of the Damour river.	Over 80% of main stakeholders have been engaged during project lifetime. The municipalities, mayors, local actors, farmers and experts helped define access points to the river, actual threats and pollution sources in addition to providing logistic support. The experts from different organizations as well as local freelance experts were involved in setting the sampling strategies in order to identify as much biodiversity as possible, evaluating results and proposing recommendations. The different stakeholders have been informed of the potential charter to be signed by each one of them for a better water resource management of the Damour river.

4. Were there any unexpected impacts (positive or negative)?

Lebanon is facing an economic and political crisis. Many challenges were raised during this project. The parliamentary elections and the political situation did not allow us to have on site focus groups that were scheduled in April-May. However, they were replaced by phone interviews with different stakeholders.
In addition, due to the political crisis, the administration logistics in Lebanon are tedious.
The shipment of the EDNA filters, and export of the EDNA samples took longer than planned especially with the ministerial strikes that lasted two weeks. Thus, the EDNA results are not done yet and were not included in this report.

[2] As stated in the approved proposal

PART II: Project Products/Deliverables

5. List each product/deliverable as stated in your approved proposal and describe the results for each of them:

#	Deliverable Description	Deliverable Update
	Inception meeting to discuss initial methodology, prepare initial meetings	Inception meeting done to kick start the project and discuss -KII methodology for social aspect -Biodiversity assessment methodology and strategy (Annex 7)
	Conduct Key Informant Interviews with locals and experts and retrieve useful ground and scientific information	Completed during the month of July 2021 Local authorities/actors, Industries and Experts have been consulted during this phase of the project. In total: ● 4 Municipalities around the upper river basin ● 3 farmers/industries around upper river basin ● 4 biodiversity experts and university professors in the domains of biodiversity, plant ecology, and oceanography, in addition to an expert in political sociology …… All the interviewed key people shared valuable information specifically related to biodiversity, threats, and pollution sources, therefore helping in understanding the status of the river, designing our methodologies for biodiversity assessments and water sampling and refining our approach to the project.
	Gather and study all available critical secondary data (geology, land-use maps, land cover, hydromorphology)	Completed from June till October. Some secondary data were gathered from desktop research, and more was provided from relevant organizations and experts: ● From Difaf's GIS expert: crucial kml files for mapping ● From CNRS: land cover land use maps ● From CDR/LibanConsult: drawings for available networks, existing wastewater treatment plant, and future projects; (Annex 6)
	Conduct a river walk-through supported by video drone to validate threats (point source pollution, erosion,	Completed from August till October. 8 Field visits were conducted to cover the two tributaries of Upstream Damour River Basin (Annex 6) A River walk-through was conducted between August 5th and November 25th aiming at assessing the river accessibility points to better prepare for the sampling methodology. In total, 8 participants in total were engaged representing 4 men and 4 women.

	floods, etc.) and identify transects and access points for field studies	
	Review, refine, and validate the methodology and scope, confirm with client	Completed in October ***<u>Site selection for biodiversity assessment:</u>*** An initial desktop review coupled with a drone survey was conducted to i) depict the various habitats within the studied river basin, ii) assess the major hazards in the area (such as dump site, landslide, change of land use…), and iii) identify access points for logistical planning to conduct an efficient and targeted assessment. Drone was used at an average elevation of 100m from ground level and covered more than 20m on each side of the riverbanks. The drone took two-dimensional panoramic view images. These images were processed and analyzed to choose tentative working areas, in order to facilitate the plots for the flora assessment and spot the accessible points to the river. Moreover, drone images helped identify particular vegetation or shrub areas and understand the terrain topography and depict accessible areas. Local community members were interviewed to define access points to the river and available threats. (Annex 1) After the selection of several points for the flora assessment, a field visit was conducted to validate the selected sites. Ten sites were selected for flora assessment, riparian habitat quality assessment (QBR) and the scoring of the Index of Potential Biodiversity (IBP).
	Define logistical plan, safety plan, procurement plan, and workplan	Completed for the field visits for the intensive screening Please refer to Annex 8 on how Difaf defined the final scope of work, and exact sample size and transects to be screened along with the final methodology of works (including possible advanced methods and techniques)
	Procure all required items and services by third parties	Equipment and professional services procured during the project according the CEPF procurement policy: ● Drone: for river walk assessment and identification of source and non-source pollution points ● Sampling bottles and consumables for water quality analysis ● Equipment for field visits and assessment ● Experts were chosen based on a TOR shared among Difaf network and an MOU was signed with selected consultants (Two on floral assessment; One on micro and macrophytes)

	Perform spot water quality analysis using field probe for biochemical parameters	Water Quality assessment was completed over 10 points for the following physio-chemical analyses: pH, Temperature, Total Dissolved Solids (TDS), Dissolved Oxygen (DO) and Conductivity ***Summary on Main Findings*** (Annex 2) -Temperature is the concentration of thermal energy in a substance such as water. The temperature in the river varies along the river and increases as we go downstream closer to the sink (sea or open water surfaces) -pH is used to indicate acidity or alkalinity of a solution on a scale of 0 to 14 respectively, with mid level pH 7 being neutral. As the concentration of H+ ions in solution increases, acidity increases, and pH gets lower. When pH is above 7, the solution is basic. pH affects most chemical and biological processes in water. It is one of the most important environmental factors limiting species distributions in aquatic habitats. Different species flourish within different ranges of pH. EPA water quality criteria for pH in freshwater suggest a range of 6.5 to 9. The pH along the Damour river is somehow similar and ranges from 8.3 to 8.6 ***which is in the normal range for pH in surface waters.*** -Dissolved oxygen (DO) refers to the concentration of oxygen gas incorporated in water. Sufficient DO is essential to growth and reproduction of aerobic aquatic life. Oxygen enters water by direct absorption from the atmosphere, which is enhanced by turbulence, water also absorbs oxygen released by aquatic plants during photosynthesis. In the Damour river, DO ranges from 87% to 97% being lowest at the source (Spot 7), due to the inflow from groundwater, and increases as we go downstream as it reacts with the atmosphere and absorbs oxygen increasing by 10% and reaching a maximum of 97% at spot 10. -The redox potential (ORP) measures the capacity of a lake or river to self-clean or to decompose waste products. In a healthy environment, the ORP should be high, more than 300mV. In the Damour river the ORP ranged from 83mV at spot 4 to reach a maximum of 132mV at spot 6. ***This indicates that the river does not have the ability to completely clean itself***. -Mid range conductivity (200 to 1000 µS/cm) is the normal background for most major rivers. Conductivity outside this range could indicate that the water is not suitable for certain species of fish or bugs. High conductivity (1000 to 10,000 µS/cm) is an indicator of saline conditions. The highest conductivity level in the river is 666

		µS/cm at spot 8 which makes ***the river in the mid-range and suitable for species to live.***
	Implement rapid biodiversity assessment methods in the selected transects covering up to 20 km^2	1. First assessment completed in November 2021 2. Second assessment completed in May 2022 The index named 'QBR' Riparian Forest Quality is the index generally used to assess the riparian habitat quality and the river's health. Scoring system: (Annex 1) ***Main Results:*** ● 3 locations with extreme degradation, bad quality ● 1 location with strong alteration, poor quality ● 2 locations with significant disturbance, fair quality ● 4 locations with some disturbance, good quality
	Gather water quality samples at point source pollution and other locations and deliver to specified lab	***Samples were taken and tested for chemical parameters: TP, TN, COD. (Annex 3)*** ***Summary on Main Findings*** For the Chemical oxygen demand (COD) the results showed that the tributary coming from Charoun to Jisr al Kadi yielded higher results than that coming from Nabaa El Safaa. The COD levels vary in different locations along the river. This shows that anthropogenic activities are causing this in different locations but the river is often able to clean itself along the way. All the results yielded a Total Phosphorus (TP) of less than 0.3 mg/L except for one location WW2 which is after the wastewater treatment plant, this indicates that effluent water from the WWTP has high TP; however, results from locations further downstream showed again TP of less than 0.3 mg/L . Nitrogen is an essential plant nutrient that is found in many naturally occurring forms in aquatic systems, including ammonia, nitrates and nitrites. In high quantities, it can cause contamination leading to increased plant and uncontrolled algae growth, low DO levels, and increased temperature. Nitrogen sources include soil erosion carrying organic matter and debris, animal waste, sewage and failing septic systems, synthetic fertilizer, and agricultural runoff. All the results showed that TKN was less than 1.

		Analysis of the water quality shows good general water quality and continuity. However, despite the river having the capacity to self-purify, it is not happening enough and not across its whole course.
	Implement intensive biodiversity screening for up to 20 km^2 using specialized methods for fauna and flora sampling campaign in the selected transects during two seasons (end of summer 2021 and end of winter 2021)	**Findings Micro and Macrophytes:** The Damour River has a high diversity of benthic diatom taxa (48) , the most common group among microalgae. Physical and chemical analyses indicated oligotrophic conditions in all locations and high ecological status. Measured physical and chemical parameters and seasons did not have a notable effect on the biological diversity of benthic diatoms. It is possible that hydro-morphological and other water conditions such as flow velocity, type of substrates, discharge of water, marginal vegetation had a greater influence on structure and composition of benthic diatom taxa than physical and chemical variables. (Annex 4) **Final Results on Flora** To have a glimpse of the biodiversity in all its components within a forest ecosystem, the Index of Biodiversity Potential (IBP) provides a straightforward evaluation of the potential capacity to host biodiversity within a forest. Each site has two scores one for the population and management of the site, and another for the context, both making the total IBP score result. All results are shown in percentage. It is obvious that most sites have a relatively low score in total, except for Rechmaya which has a satisfying total score of 62%. When we diagnose the composing sub scores, we find that most of the lower factors are related to the management rather than the context, such as in Fouara-Wadi El Sett, Brih, Al Werhaniyeh, Ramliyeh and Nabaa Al Safa. Since the latter is related to the diversity of habitats and spatial and temporal continuity of the forest, it is evident that the current and recent past management practices are the most common drivers for the limited potential capacity to host biodiversity on sites. Yet, there are few sites such as in Jisr El Qadi, Selfaya, Majdel El Meouch, Ramliyeh-Mecherfeh where both type of factors are contributing to the limited biodiversity hosting capacity (Annex 1)

	Results analysis, correlations, and report writing	Overall results please refer to (Annex 1) Factors that are favorable for hosting biodiversity: ● Native tree species richness ● Vertical structure of the vegetation ● Standing big dimension dead ● Dead trees on the ground ● Big standing living trees are ● The presence of open spots with flowering plants ● The temporal (and spatial) continuity of the forest ● The average values for the presence of aquatic zones ● The high values for the presence of rocky It is evident that there is no direct correlation between flora richness on one hand, and the riparian habitat quality and potential biodiversity on the other hand. However, it is clear that whenever the riparian habitat quality is high, the capacity to host biodiversity augments.

	Perform eDNA tests for water spots on the river	Environmental DNA (eDNA) sequencing is a rapidly emerging method for studying biodiversity and monitoring ecosystem changes. As organisms shed DNA into their environments, eDNA analysis can provide clues about the species present without disrupting the ecosystem. ***Findings on vertebrates and macroinvertebrates:*** **Regarding the vertebrates**, a total of 27 taxa were detected of which 44.4% (12 taxa) were at least 99% similar to a species in the global reference databases, a total of 4 unique fish, 6 amphibians, 1 reptile, 13 birds and 3 mammals were detected. The taxa belong to 9 orders, 19 families, and 21 genera. Species of note include European eel (*Anguilla anguilla - Critically Endangered*), and Mediterranean spur-thighed tortoise (*Testudo graeca - Vulnerable*). Among the most commonly detected species were marsh frog (*Pelophylax ridibundus*) and Mesopotamian barb (*Capoeta damascina*) which endemic to Lebanon. **Regarding the macroinvertebrates,** a total of 332 taxa were detected of which 3.9% (13 taxa) were at least 99% similar to a species in the global reference databases. Among the most commonly detected species were *Baetis pacis, Dasyphora cyanella and Gammarus italicus.* ***Summary on Main Findings*** In spots 1, 2 ,6, and 8 wastewater effluents are discharged from industries, restaurants, slaughterhouses, and WWTP which caused a reduction/absence of certain species (European Eel, barb fish, frogs) compared to other spots suggesting that some of these might be sensitive to pollutants. This indicates that upstream wastewater dumps could be affecting the fauna in the nearby spots more than downstream ones where the water quality seems to get better, and the species are found in greater numbers. **Conclusion** The fauna eDNA assessment results showed that the river basin is a host for biodiversity, showed few species with important ecological value, with one confirmed specie found as endemic to Lebanon, and two are threatened. Two species, freshwater crab and water snakes were observed during the field visit but were not present in the eDNA test.

<table>
<tr><td></td><td></td><td>From another perspective, the impact of anthropogenic activities might be affecting the species richness and abundance.</td></tr>
<tr><td></td><td>Conduct key informant interviews (with key local and other stakeholders)</td><td>Completed - during the months of August-October for Key Experts, local authorities' representatives, and local actors-

14 municipalities and 3 industries were interviewed to collect data on status of river and main pollution sources and threats. This helped define methodology for sampling and screening of point and nonpoint pollution sources. (Annex 5-7)</td></tr>
<tr><td></td><td>Perform stakeholder mapping and power analysis</td><td>Completed
We have identified the different stakeholders depending on their power and interest.
<table>
<tr><td>HIGH POWER, LOW INTEREST
1. Farmers
2. Industries
KEEP SATISFIED</td><td>HIGH POWER, HIGH INTEREST
1. Municipalities
2. Local actors
3. Ministry of Energy and Water
MANAGE CLOSELY</td></tr>
<tr><td>LOW POWER, LOW INTEREST
1. Non-functional wastewater treatment plant
MONITOR</td><td>LOW POWER, HIGH INTEREST
1. Academic institutions
2. Experts
3. CSOs/NGOs
KEEP INFORMED</td></tr>
</table></td></tr>
<tr><td></td><td>Produce a draft river conservation action plan</td><td>To conserve and protect the UDRV, several areas of intervention need to be addressed. These include biodiversity conservation, sustainable management of natural resources, policy development and law enforcement as well as education and awareness.

This project has deeply assessed the component of biodiversity conservation and will detail here below a full list of recommendations and activities which help prevent further deterioration and enhance the status of the riparian ecosystem.

The impact of anthropogenic activities is not directly felt in terms of species richness, but rather in their abundancy. Based on the IBP Index, it is evident that the current and recent past management</td></tr>
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practices are the most common drivers for the limited potential capacity to host biodiversity in different locations.

Nonetheless, it is very obvious that several aspects of riparian zone management could enhance the capacity to host biodiversity. Among the recommended actions:

- The preservation of old trees from cutting (namely Alnus orientalis and Platanus orientalis)
- The preservation of standing dead trees and logs, even if these would be in the riverbed, as debris, because they might form small islands which would increase the habitat diversity and richness, and attract a panoply of decomposers such as fungi, insects, and their predators (birds).
- The protection of the understory from cutting, mowing, or grazing in specific spots, in order to improve the vertical structure, while creating open spots in dense canopy to allow natural regeneration and the growth of flowering plants. Minimal cutting or felling is recommended in very dense canopies.
- The conservation of spatial continuity of the forest and promoting the creation of forest edges and corridors linking the riparian zone to the neighboring forests or conducting ecosystem restoration through the reforestation of open or degraded slopes around the riparian zones.
- The evident correlation or linkage between the capacity to host biodiversity and habitat quality urge us to consider activities targeting the improvement of the latter by:

- Limiting or prohibiting habitat destruction along the riverbanks, and in riverbeds.
- Limiting the alteration of riverbanks
- Reducing water deviation from riverbed into channels
- Reducing the proliferation of invasive or alien species (i.e. Ailanthus altissima, Ricinus communis) by removing its individuals, and replacing it by species of high ecological value and rapid growth (Platanus orientalis, Salix libani, Salix alba, Alnus orientalis, Populus alba, etc.)

- The protection of the variety of species found in the eDNA results, and their ability to thrive and reproduce by limiting the sources of pollutants being discharged into the river

		In terms of promoting sustainable practices and sustainable management of natural resources, several action points shall be taken into consideration: ● Design and implement a solid waste management plan for the UDRV ● Prevent the discharge of untreated wastewater into the river by activating and building the capacity of the wastewater treatment plants and monitoring their performance ● Develop and implement a sustainable grazing management plan, in full engagement with shepherds ● Promote sustainable agricultural practices, among the farmers of the UDRV, and essentially regulate the use of the river water for irrigation ● Develop and implement an ecotourism plan for UDRV Under policy development and law enforcement, it is crucial that following steps are followed to ensure river protection. ● Strengthen the role of municipalities, as local administrative authorities, to adopt policies and enact laws through building their capacities. ● Advocate for the adoption of local policies at municipal level to combat illegal and unsustainable practices, including overgrazing, hunting, overuse of water for irrigation, untreated wastewater discharge, solid waste dumping, etc.. ● Formulate a River Committee, representing various stakeholders, to govern and manage river activities and interventions. ● Develop a River Charter for the whole basin, based on the pilot UDRV to be completed under this project ● Advocate for the adoption of Damour Basin River Charter by the Ministry of Energy and Water, and other relevant governmental institutions. Awareness and Education is an integral part of conservation, which shall be addressed in achieving conservation effectiveness at UDRV. ● Build the capacity of local community groups, including youth and women, to help implement conservation work at the river ● Develop and implement informative sessions to keep the key stakeholders informed and engaged ● Design and implement an annual campaign to address conservation needs and spread awareness

	Produce tools and plan for multi-stakeholder engagement and dissemination plan	Please refer to the “Stakeholder Engagement Plan Report”
	Draft an outline of a pilot river basin committee	Consultations were made with key stakeholders at the targeted areas to nominate representatives and formulate the Damour River Basin (DRB) Committee, as a management structure for the river basin. The committee is to represent the municipalities and various stakeholders in managing activities and interventions recommended at the site. A guiding protocol (Annex 10) on the establishment and functions of this committee has been produced. It has yet to be complemented with assessments’ results and recommendations, shared with potential committee members, and endorsed by relevant stakeholders and municipalities.

	Design and conduct up to 6 FGDs to develop a charter to refine IRBMP	Due to the parliamentary elections in Lebanon, the Multi-dimensional Crisis (Economic meltdown, Beirut Blast, fuel crisis, COVID waves and lockdowns) the organization of Focus groups proved to be quite challenging, with several attempts and cancelations last minute. Instead, phone interviews were conducted with the municipality of each concerned area in Damour during conduction of project to explain project and our activities. Then after retrieving the last analysis (eDNA) and water quality samples, we developed the final version of the Charter and projected suggestions for useful activities, and held an-online FGD to validating the suggestions from the local community. **Findings of the Interviews** Difaf has met with several mayors or representatives from different municipalities along the Damour river including Rachmaya, Maasritti, Ramlieh, Charoun, Ain Zhalta, Brih and El Bire to gather information and discuss the importance and benefits of the river as well as the understanding of the challenges and problems it faces and how to conserve and protect the river. The main water use in the area is for irrigation mainly for citrus trees and vegetables in the spring and summer season, as well as a touristic attraction for nature enthusiasts for hikes and swimming in the river. Additionally, a lot of restaurants are also present along the river which attracts a lot of tourists which boosts the economy. In Rechmaya village in addition to irrigation and tourism purposes, the river water is also used for generating electricity from the hydropower station which is currently being renovated by USAID. All municipalities are aware of the responsibility they have towards the river when it comes to maintaining it, in general municipalities would usually reject or oppose any project that might affect the river by either refraining from issuing permits or stopping the works, as well as ensuring the cleanliness of the river in some villages including Rechmaya and Ain Zhalta and all agree that the biggest threat and polluting source on the river is the untreated wastewater being discharged into the river and the illegal encroachment along the river. There is only two new projects that are being proposed which is the construction of a wastewater treatment plant to treat the sewage from several villages in the area, this project is supported by some municipalities since it would solve the wastewater problem being discharged in the river and rejected by other municipalities since

they believe that the wastewater treatment plant will not be maintained thus not treating the wastewater efficiently, this project is subject to the follow-up of the Council for Development and Reconstruction in cooperation with Kuwait. The second project is related to eco-tourism, through the creation of a permanent environmental path in the Charoun Valley.

Most of the villages agree that the present laws are sufficient for the preservation and protection of the river however, these laws are not being implemented by the ministry of water and energy.
Additionally, a major constraint that is hindering the protection of the river is the financial and human inability of the municipalities to follow up and implement the proposed activities.

Based on all data collected, consultations with stakeholders, and findings of the study, a draft charter was produced with activities to be validated through an online meeting with main local community representatives and authorities (Annex 9).

The Charter is a social contract and Management Plan for Upper Damour River Basin (UDRB) aiming for developing and realizing activities which would eventually promote:

- Biodiversity Conservation,
- Sustainable Management of Resources/ Promoting sustainable practices,
- Policy Development and Law Enforcement and
- Education and Awareness concerning water and river basin conservation

Eventually the Charter can be made official, as starting seed project, which would relate to the development of water management strategy in Lebanon, since the new Water Code of Lebanon is now promoting integrated water management at river basin scale by creating river basin organization.
As pilot the charter is now limited to the Upper Damour Area, which can also be scaled up to cover the whole of the basin in the future, given a similar project takes place on that scale.

		Online- Validation Workshop A presentation (Addendum 2) and an active discussion on activities was conducted in an online meeting where all major local stakeholders of the UDRB was invited to. It took place on September 28th and the presentation discussed the objectives of the project, the major pollutants, the ecological value of the river, the fauna and flora findings including eDNA results(Addendum 3), links with water quality, and the recommendations gathered or suggested. The participants who attended were mainly the mayors and members of the municipalities surrounding the upper river basin target area. After presentation of the main findings of the study the final draft of proposed UDRB charter (Addendum1/ Annex 9), to get initial validation and consensus on proposed activities or new suggestions integrated and the communal approval of charter objectives and main activities (Addendum1 / Annex 9). After getting consensus from all participants and show of interest to continue and collaborate on developing this initiative, it was agreed that a WhatsApp® group should be created and whoever would like officially declare approval would join the group. Out of all invitees, the main municipalities of Charoun, Majd El Moush, Ain Zhalta, and Ramlieh joined the group and showed interest to continue and develop the charter relevant to UDRB activities.

5. Please describe and submit any tools, products, or methodologies that resulted from this project or contributed to the results.

- Report on Flora assessment
- Report on Macro and Microphytes

PART III: Lessons, Sustainability, Safeguards and Financing

Lessons Learned

7. Describe any lessons learned during the design and implementation of the project, as well as any related to organizational development and capacity building.

"Lessons learned" are experiences you have gained that you think would be valuable successes worth replicating or practices that you would do differently if you had the chance. Consider lessons that would inform project design and implementation, and any other lessons relevant to the

conservation community. CEPF Lessons Learned Guidelines are available here: https://www.cepf.net/sites/default/files/cepf-lessons-learned-guidelines-english.pdf.

1. Biodiversity assessment planning: The fact that we have met with different biodiversity experts to better plan the assessment objectives, dates, location and how to cover all seasons and all biological diversity has made us aware of all logistics needed to plan an exhaustive biodiversity assessment.
2. EDNA sampling: During the implementation of this project, we have been on constant contact with nature metrics, the company responsible for identifying the animal species present in the Damour River. The lessons learned revolved around how, when and where to sample the water. In addition, on how to preserve the EDNA and optimization of the filtering technique.
3. Capacity building: A Workshop on Project planning, proposal writing and fundraising was followed by our technical assistant on May 9 2022.

Sustainability / Replication

8. **Summarize the success or challenges in ensuring the project will be sustained or replicated, including any unplanned activities that are likely to result in increased sustainability or replicability.**

Municipalities around Damour River, Lebanese Reforestation Initiative and Alshouf Conservation society are committed to implement the charter (Annex 9). The sustainability of the project resides in the fact that all stakeholders and local actors are engaged in protecting the Damour. The main challenge is to coordinate between all stakeholders, from raising awareness to the local actors about the importance of conserving the river for better long-term use and conservation planning.

Safeguards

9. **If not listed as a separate Deliverable and described above, summarize the implementation of any required action related to social or environmental safeguards that your project may have triggered.**

A Stakeholder engagement plan was prepared and submitted to the regional implementation team. The plan was useful to prepare a stakeholder analysis and include relevant stakeholder in the charter.

Additional Funding

10. **Provide details of any additional funding that you have secured to support this project.**

    a. **Total additional funding ($ USD)**

    b. **Type of funding**

Please provide a breakdown of additional funding (counterpart funding and in-kind) by source.

Donor	Type of Funding	Amount

Additional Comments/Recommendations

11. Use this space to provide any further comments or recommendations in relation to your project or CEPF.

PART IV: Impact at Portfolio and Global Level

Contribution to Portfolio Indicators

12. In order to measure the results of CEPF investment strategy at the hotspot level, CEPF uses a set of Portfolio Indicators which are presented in the Ecosystem Profile of each hotspot. Please list these below and report on the project's contribution(s) to them.

Indicator	Actual Numeric Contribution	Actual Contribution Description
2.4 Number of Freshwater KBAs in priority CMZ with improved information on biodiversity, shared with stakeholders	1	An inventory on the biodiversity present in Nahr Ed-Damour KBA along with the water quality analysis is now available. The correlation between the fauna and flora component and the habitat quality in the different spots is important for any conservation activities that will be applied potentially in the future.
4.6 Number of KBAs for which information on plants is improved	1	10 selected sites in the area has were assessed.

Contribution to Global Indicators

Please report on all Global Indicators that pertain to your project.

13. Benefits to Individuals
13a. Number of men and women receiving structured training.

Report on the number of men and women that have benefited from structured training due to your project, such as financial management, beekeeping, horticulture, farming, biological surveys, or how to conduct a patrol.

# of men receiving structured training *	# of women receiving structured training *	Topic(s) of Training

**Please do not count the same person more than once. For example, if 5 men received structured training in beekeeping, and 3 of these also received structured training in project management, the total number of men who benefited from structured training should be 5.*

13b. Number of men and women receiving cash benefits.
Report on the number of men and women that had an increase in income or cash (monetary) benefits due to your project from activities such as tourism, handicraft production, increased farm output, increased fishery output, medicinal plant harvest, or payment for conducting patrols.

# of men receiving cash benefits*	# of women receiving cash benefits*	Description of Benefits

**Please do not count the same person more than once. For example, if 5 men received cash benefits due to tourism, and 3 of these also received cash benefits from increased income due to handicrafts, the total number of men who received cash benefits should be 5.*

14. Protected Areas
Number of hectares of protected areas created and/or expanded
Report on the number of hectares of protected areas that have been created or expanded as a result of your project. Protected areas may include private or community reserves, municipal or provincial parks, or other designations where biodiversity conservation is an official management goal.

Name of PA*	Country(s)	Original # of Hectares**	# of Hectares Newly Protected	Year of Legal Declaration/ Expansion	Longitude***	Latitude***

** If possible please provide a shape file of the protected area to CEPF.*
*** Enter the original total size, excluding the results of your project. If the protected area was not existing before your project, then enter zero.*
**** Indicate the latitude and longitude of the center of the site, to the extent possible, or send a map or shapefile to CEPF. Give geographic coordinates in decimal degrees; latitudes in the Southern Hemisphere and longitudes in the Western Hemisphere should be denoted with a minus sign (example: Latitude 38.123456 Longitude: -77.123456). To obtain the latitude and longitude of your protected area, use googlemap, right click on the center of your protected area, and select "What's here?", and copy the latitude and longitude appearing in the popup window.*

15. Key Biodiversity Area Management
Number of hectares of Key Biodiversity Areas (KBA) with improved management
Report on the number of hectares in KBAs with improved management, where tangible results have been achieved to support conservation, as a result of your project. Examples of improved management include, but are not restricted to: increased patrolling, reduced intensity of snaring, invasive species eradication, reduced incidence of fire, and introduction of sustainable agricultural/fisheries practices. Do not record the entire area covered by the project - only record the number of hectares that have improved management.

If you have recorded part or all of a KBA as newly protected for the indicator entitled “protected areas”, and you have also improved its management, you should record the relevant number of hectares for both this indicator and the “protected areas” indicator.

Name of KBA	KBA Code from Ecosystem Profile	# of Hectares Improved *
Nahr Ed-Damour	*LBN10*	*2000*

** Do not count the same hectares more than once. For example, if 500 hectares were improved due to implementation of a fire management regime in the first year, and 200 of these same 500 hectares were improved due to invasive species removal in the second year, the total number of hectares with improved management would be 500.*

16. Production landscapes

Number of hectares of production landscape with strengthened management of biodiversity

Please report on the number of hectares of production landscapes with strengthened management of biodiversity, as a result of your project. A production landscape is defined as a landscape where commercial agriculture, forestry or natural product exploitation occurs.

- For an area to be considered as having "strengthened management of biodiversity," it can benefit from a wide range of interventions such as best practices and guidelines implemented, incentive schemes introduced, sites/products certified, and sustainable harvesting regulations introduced.
- Areas that are protected are not included under this indicator, because their hectares are counted elsewhere.
- A Production Landscape can include part or all of an unprotected KBA.

Name of Production Landscape*	# of Hectares with Strengthened Management**	Latitude***	Longitude***	Description of Intervention
Naher Ed-Damour - *KBA LBN10*	*2000*	33°45'10.64"N	35°42'4.38"E	The management strengthened through the following actions: Biodiversity assessment and water quality analysis in this KBA. Difaf produced a charter engaging the relevant stakeholders (municipalities and NGOs) to prepare the future integrated river basin management plan

** If the production landscape does not have a name, provide a brief descriptive name for the landscape.*

***Do not count the same hectares more than once. For example, if 500 hectares were strengthened due to certification in the first year, and 200 of these same 500 hectares were strengthened due to new harvesting regulations in the second year, the total number of hectares strengthened to date would be 500.*

**** Indicate the latitude and longitude of the center of the site, to the extent possible, or send a map or shapefile to CEPF. Give geographic coordinates in decimal degrees; latitudes in the Southern Hemisphere and longitudes in the Western Hemisphere should be denoted with a minus sign (example: Latitude 38.123456 Longitude: -77.123456). To obtain the latitude and longitude of your production landscape, use Googlemap®, right click on the center of your production landscape, and select "What's here?", and copy the latitude and longitude appearing in the popup window.*

17. Benefits to Communities

CEPF wants to record the non-cash benefits received by communities, which can differ to those received by individuals because the benefits are available to a group. CEPF also wants to record, to the extent possible, the number of people within each community who are benefiting. Please report on the characteristics of the communities, the type of benefits that have been received during the project, and the number of men/boys and women/girls from these communities that have benefited, as a result of your project. If exact numbers are not known, please provide an estimate.

Please provide information for all communities that have benefited from project start to project completion.

Name of Community				Community Characteristics (mark with x)				Country of Community	Type of Benefit (mark with x)							# of Beneficiaries			
	Small landowners	Subsistence economy	Indigenous/ ethnic peoples	Pastoralists / nomadic peoples	Recent migrants	Urban communities	Other*		Increased access to clean water	Increased food security	Increased access to energy	Increased access to public services (e.g. health care, education)	Increased resilience to climate change	Improved land tenure	Improved recognition of traditional knowledge	Improved representation and decision-making in governance forums/structures	Improved access to ecosystem services	# of men and boys benefitting	# of women and girls benefitting
																	X		

*If you marked "Other" to describe the community characteristic, please explain:

18. Policies, Laws and Regulations

Report on policies, laws and regulations with conservation provisions that have been enacted or amended, as a result of your project. "Policies" pertain to statements of intent formally adopted or pursued by a government, including at sectoral or sub-national level. "Laws and regulations" pertain to official rules or orders, prescribed by authority. Any law, regulation, decree or order is eligible to be included.

18a. Name, scope and topic of the policy, law or regulation that has been amended or enacted as a result of your project

No.		Scope (mark with x)			Topic(s) addressed (mark with x)															
	Name of Law, Policy or Regulation	Local	National	International	Agriculture	Climate	Ecosystem Management	Education	Energy	Fisheries	Forestry	Mining and Quarrying	Planning/Zoning	Pollution	Protected Areas	Species Protection	Tourism	Transportation	Wildlife Trade	Other*
1																				
2																				
…																				

*** If you selected "other", please give a brief description of the main topics addressed by the policy, law or regulation.**

18b. For each law, policy or regulation listed above, please provide the requested information in accordance with its assigned number.

No.	Country(s)	Date enacted/ amended MM/DD/YYYY	Expected impact	Action that you performed to achieve this change
1				
2				
3				

19. Biodiversity-friendly Practices

Number of companies that adopt biodiversity-friendly practices

Please list any companies that have adopted biodiversity-friendly practices as a result of your project. While companies take various forms, for the purposes of CEPF, a company is defined as a for-profit business entity. A biodiversity-friendly practice is one that conserves or uses natural resources in a sustainable manner.

No.	Name of Company	Description of biodiversity-friendly practice adopted during the project	Country(s) where the practice has been adopted by the company
1			
2			
…			

20. Networks & Partnerships

Number of networks and/or partnerships created and/or strengthened

Report on any networks or partnerships between and among civil society groups and other sectors that you have created or strengthened as a result of your project. Networks/partnerships should have some lasting benefit beyond immediate project implementation. Informal networks/partnerships are acceptable. Examples of networks/partnerships include: an alliance of fisherfolk to promote sustainable fisheries practices, a network of environmental journalists, a partnership between one or more NGOs with one or more private sector partners to improve biodiversity management on private lands, or a working group focusing on reptile conservation.

Do not list the partnerships you formed with others to implement this project, unless these partnerships will continue after your project ends.

No.	Name of Network / Partnership	Year established	Did your project establish this Network/ Partnership? Y/N	Country(s) covered	Purpose
1					

21. Sustainable Financing Mechanism

List any functioning sustainable financing mechanisms created or supported by your project. Sustainable financing mechanisms generate funding for the long-term (generally five or more years). These include, but are not limited to, conservation trust funds, debt-for-nature swaps, payment for ecosystem service

(PES) schemes, and other revenue, fee or tax schemes that generate long-term funding for conservation. To be included, a mechanism must be delivering funds for conservation.

21a. Details about the mechanism

No.	Name of Financing Mechanism	Purpose of the Mechanism*	Date of Establishment**	Description***	Countries
1					
2					
3					

**Please provide a succinct description of the mission of the mechanism.*
***Please indicate when the sustainable financing mechanism was officially created. If you do not know the exact date, provide a best estimate.*
****Description, such as trust fund, endowment, PES scheme, incentive scheme, etc.*

21b. Performance of the mechanism
For each Financing Mechanism listed previously, please provide the requested information in accordance with its assigned number.

NO.	Project intervention (mark with x)			Has the mechanism disbursed funds to conservation projects?
	Created a mechanism	Supported an existing mechanism	Created and supported a new mechanism	
1				
2				
3				

22. Red List Species

If the project included direct conservation interventions that benefited globally threatened species (CR, EN, VU), as per the IUCN Red List, add the species below.

Examples of interventions include: preparation or implementation of a conservation action plan, captive breeding programs, species habitat protection, species monitoring, patrolling to halt wildlife trafficking, and removal of invasive species.

Genus	Species	Common Name (Eng)	Status (VU, EN, CR or Extinct in the Wild)	Intervention	Population Trend at Site (increasing, decreasing,

					stable or unknown)
Anguilla	Anguilla	European eel	CR	Improve knowledge and management	Unknown

Part V. Information Sharing and CEPF Policy

CEPF is committed to transparent operations and to helping civil society groups share experiences, lessons learned, and results. Final completion and impact reports are made available on our Web site, www.cepf.net, and publicized in our e-newsletter and other communications.

Provide the contact details of your organization (organization name and generic email address) so that interested parties can request further information about your project.

Organization Name: ***Difaf SAL***
Generic email address: inflow@difaf.org