Lesser Zab Threat Assessment &

Draft Action Plan

January 2013

# Introduction

The Lesser Zab Threat Assessment took place throughout 2012 and was funded by the [Rufford Small Grants Fund](http://www.ruffordsmallgrants.org/) and Nature Iraq. It consists of surveys of the Lesser Zab River and its major tributaries to identify and evaluate all threats to the river based on criteria identified by the International Union for the Conservation of Nature (IUCN). This project is conducted in cooperation with the Kurdistan Environmental Protection and Improvement Board and was the first effort of its kind in Iraq that visited the entire basin using such comprehensive surveys.

In addition to an assessment of the threats to the basin presented in this report and a targeted action plan has been developed to effectively address each threat and is presented here. The strategic objectives and action steps outlined in this plan will guide future efforts of the Waterkeepers Iraq and other government and non-governmental groups in efforts to protect the rivers and waterways of Kurdistan, northern Iraq.

# Methodology

## Threat Assessment

The Iraq Upper Tigris Waterkeeper conducted a threat assessment using the Pressure-State-Response (PSR) Model as outlined and carried out by the Nature Iraq Key Biodiversity Areas Project. This method is an adaptation of a method outlined by BirdLife International (2006) for assessing threats to areas of conservation concern. The PSR Model relies on three types of indicators: Pressure, State & Response.

The threat assessment method primarily addressed here is focused on pressure indicators. The identification and tracking of threats to an areas from pollution, urban development and other issues. State indicators (measurements or attributes that refer to the condition of the site) and Response indicators (conservation actions being taken at a site) are presently beyond the scope of this project.

Pressure Indicators consist of the following eleven threat types, as defined by the IUCN in BirdLife Int’l (2006):

1. Agricultural expansion & intensification: Threats from farming and ranching as a result of agricultural expansion and intensification, including silviculture, mariculture and aquaculture. Note that wood and pulp plantations includes: afforestation, and livestock farming and ranching includes forest grazing. Agricultural pest control and agricultural pollution-specific problems apply to ‘5. Overexploitation, persecution & control’ and ‘9. Pollution’ respectively.

Note: In this project, it was often difficult to determine the level of “expansion” and/or “intensification” occurring along the river, which would have required some understanding of previous baseline information on the area used for agriculture thus the present assessment merely provides information on the current agricultural activity along the river.

2. Residential & commercial development: Threats from human settlements or other non-agricultural land uses with a substantial footprint; resulting in habitat destruction and degradation. Note that domestic or industrial pollution-specific problems apply to ‘9 Pollution’.

3. Energy production & mining: Threats from production of non-biological resources; resulting in habitat destruction and degradation.

4. Transportation & service corridors: Threats from long narrow transport corridors and the vehicles that use them; resulting in habitat destruction, degradation, and disturbance.

5. Over-exploitation, persecution & control: Threats from consumptive use of wild biological resources including both deliberate and unintentional harvesting effects; also persecution or control of specific species.

6. Human intrusions & disturbance: Threats from human activities that alter, destroy and disturb habitats and species associated with non-consumptive uses of biological resources.

7. Natural system modifications: Threats from actions that convert or degrade habitat in service of managing natural or semi-natural systems, often to improve human welfare. Note that ‘other ecosystem modifications’ includes intensification of forest management, abandonment of managed lands, reduction of land management, and under grazing. ‘Dams & water management/use’ includes construction and impact of dykes/dams/barrages, filling in of wetlands, groundwater abstraction, drainage, dredging and canalisation.

8. Invasive & other problematic species & genes: Threats from non-native and native plants, animals, pathogens and other microbes, or genetic materials that have or are predicted to have harmful effects on biodiversity (through mortality of species or alteration of habitats) following their introduction, spread and/or increase in abundance. We were not able to assess these threats due to lack of information.

9. Pollution: Threats from introduction of exotic and/or excess materials from point and non-point sources causing mortality of species and/or alteration of habitats. Note that domestic and urban waste water includes sewage and run-off; industrial and military effluents includes oils spills and seepage from mining; agricultural and forestry effluents and practices includes nutrient loads, soil erosion, sedimentation, high fertiliser input, excessive use of chemicals and salinization; and air-borne pollutants includes acid rain.

10. Geological events: Threats from catastrophic geological events that have the potential to cause severe damage to habitats and species. We were not able to assess these threats due to lack of information but in most cases the main geological threats facing Iraq are earthquakes.

11. Climate change & severe weather: Threats from long-term climatic changes which may be linked to global warming and other severe climatic/weather events. We were not able to assess these threats due to lack of information but global warming, desertification and increased dust storm events are potentially significant threats in Iraq.

Special note

As stated, threats 8, 10 & 11 were beyond our current abilities to assess and thus were not included in the assessment process.

## Rating each threat

Each threat class was rated based on its Timing, Scope and Severity. Scoring for each was based on a 0-3 scale as defined below.

|  |  |
| --- | --- |
| ***Instructions for threats scoring:*** |  |
| ***Timing of selected threats*** | ***Timing Score*** |
| Happening now | 3 |
| Likely in short term (within 4 years) | 2 |
| Likely in long term (beyond 4 years) | 1 |
| Past (and unlikely to return) and no longer limiting or No Threat | 0 |
| not evaluted | blank |
|  |  |
| ***Scope of selected threats*** | ***Scope score*** |
| Whole area/population (>90%) | 3 |
| Most of area/population (50-90%) | 2 |
| Some of area/few individuals (10% - 49%) | 1 |
| Small area/few individuals (<10%) or No Threat | 0 |
| not evaluated | blank |
|  |  |
| ***Severity of selected threat*** | ***Severity Score*** |
| Rapid deterioration (>30% over 10 years or 3 generations, whichever is longer) | 3 |
| Moderate deterioration (10-30% over 10 years or 3 generations | 2 |
| Slow deterioration (1-10% over 10 years or 3 generations) | 1 |
| No or imperceptible deterioration (<1% over 10 years) or No Threat | 0 |
| not evaluated | blank |

The Timing, Scope and Severity Scores were then added to provide an integrated threat assessment score between 0-9.

**Impact Score = Timing Score + Scope Score + Severity Score**

Note that if either Timing, Scope, or Severity Score was 0, the Impact Score was automatically listed as 0.

The Impact Score would then be used to classify the particular threat into its final Threat Status Score (which was color-coded) as a Low, Medium, High or Very High threat based on the following scale:

|  |  |  |
| --- | --- | --- |
| **Impact Score =** | **Threat Status Score** | |
| **0 =** | | **0 Low** |
| **3-5 =** | | **-1 Medium** |
| **6-7 =** | | **-2 High** |
| **8-9 =** | | **-3 Very High** |

## River Reach

Whereas in the Nature Iraq Key Biodiversity Areas project, the threat assessment was applied to an area that might include terrestrial and aquatic habitats, in the Lesser Zab Threat Assessment this methods was applied to a “River Reach”. A reach was defined as a section of river that could be surveyed in a single day. Thus based on terrain and ease of access, the river reaches on the Lesser Zab River utilized in this project were of varying size (ranging from as high as X to as small as X).

## Record Keeping

The start and end GPS Coordinates were identified and the name of the reach consisted of the name of the starting name or village name to the ending area or village name, as in: “Suraban Bridge to Mokaba Village”. A Nature Iraq Basic Site Information sheet was filled out for all sites that included basic information on the site (i.e. date of visit, logisitical information, GPS start and end locations and elevations, and hand drawn maps of the site). Photos were taken throughout the reach survey and the threat assessment was filled based on notes taken in the field at the end of each survey day. Once the Waterkeeper returned to the office, the data was entered into a Microsoft Access Database.

# Data & Discussion

## THREATS

The main threats on Lesser Zab by sector are as follows:

Scoring of Lesser Zab River Threats was as follows:

| **Threat Types** | **Average Impact Score** | **Highest Impact Score** | **Total #** |
| --- | --- | --- | --- |
| 1. Agriculture | 3 (Medium Threat) | 7 (High Threat) | 55 |
| 2. Residential & commercial development | 3 (Medium Threat) | 7 (High Threat) | 25 |
| 3. Energy production & mining | 6 (High Threat) | 8 (Very High Threat) | 35 |
| 4. Transportation & service corridors | 3 (Medium Threat) | 6 (High Threat) | 18 |
| 5. Over-exploitation, persecution & control of species | 1 (Low Threat) | 6 (High Threat) | 19 |
| 6. Human intrusions & disturbance | 5 (Medium Threat) | 8 (Very High Threat) | 9 |
| 7. Natural system modifications | 4 (Medium Threat) | 7 (High Threat) | 11 |
| 8. Invasives & other problematic species and genes | Not assessed | |  |
| 9. Pollution | 3 (Medium Threat) | 7 (High Threat) | 53 |
| 10. Geological events | Not assessed | |  |
| 11. Climate change and severe weather | Not assessed | |  |
| Total |  | | 225 |

Sectors with Highest Impact Score & Highest number of threats by general order of priority:

|  |  |
| --- | --- |
| **Threat Types** | **Specific threats** |
| 3. Energy production & mining | Gravel mining |
| 6. Human intrusions & disturbance | Minefields and materials left over from Iran/Iraq war |
| 1. Agriculture | Combination of fish farms, small farms, animal grazing and agro industry farms |
| 9. Pollution | Garbage and waste from villages; Sewage and wastewater; Noise pollution from gravel mining, smuggling |
| 2. Residential & commercial development | Housing developments; recreational development; 1 refinery on the river bank |
| 7. Natural system modifications | Dams and water management ( from proposed dam or existing dams) |
| 5. Over-exploitation, persecution & control of species | Electro-fishing |
| 4. Transportation & service corridors | River crossings; tertiary dirt roads for gravel mines; areas used by cars for car washing |

Additionally, there are some threats to the river that are somewhat unique to the region, such as smuggling in the border region (where the Lesser Zab forms the border between Iraq and Iran) and minefields near to or even adjacent to the rivers (also in the border areas).

## Threat Maps

A series of GIS Maps have been prepared from the data that provide more comprehensive information on where the highest threats are occurring along the Lesser Zab River for each threat category.

**3. Energy production & mining (note this is the draft map)**

# DRAFT ACTION PLAN

Based on an assessment of the threats observed on the Lesser Zab River a series of Objectives, Strategies and Action Steps have been identified for various aspects of the threats identified by the survey. Each objective will require concrete strategic actions and specific action steps to achieve the objective(s). Thirteen specific threats are targeted here and were selected because they were considered high priority threats as well as threats where we felt the Waterkeepers Iraq Program could have some impact in the short to medium term. These are presented to encourage discussion and focus future work of the Waterkeepers Iraq Program and related initiatives of Nature Iraq and its partner governmental and non-governmental organizations.

**1) The following strategic actions and action steps have been identified for Strategic Objective 1.1, 1.2, & 1.3 to address one of the highest threats seen on the Lesser Zab River: Gravel mining.**

|  |  |  |  |
| --- | --- | --- | --- |
| **Threat 3. Resource Extraction & Mining: Riparian & In-stream Gravel Mining** | | | |
|  | ***Objective 1.1*** | *By 2013, local and government stakeholders are aware of threat from in-stream gravel mining* | |
|  |  | *Strategic action 1.1.1* | *Publish information on in-stream gravel mining for key stakeholders* |
|  |  | Action Step #1 | Collect information and research all aspects of in-stream gravel mining (Who runs the gravel mining operations; How is gravel mined; Where it occurs; Who provides the land and permissions for such operations; What are the profit margins involved; How does it affect the land; how many operations are legal vs illegal; and what licenses, rules and regulations govern such operations? |
|  |  | Action Step #2 | Obtain old photographs of areas before gravel mining operations occurred to compare with photos taken after operations were conducted |
|  |  | Action Step #3 | Refine objectives, strategic actions and action steps accordingly, update the action plan; translate and publish in a white paper on gravel mining |
|  |  | *Strategic action 1.1.2* | *Implement a Gravel Mine Awareness Program targeting local people, decision-makers & the industry itself* |
|  |  | Action Step #1 | Make a documentary about how people, villagers and farmers and the land itself are affected from gravel mining. |
|  |  | Action Step #2 | Show the documentary to the governors responsible for each area and talk to the government and municipality of Suly, Hawler, and Kirkuk. It is important to show them the map, documents, film and all the scientific effects on the area. |
|  |  | Action Step #3 | Take the media to areas such as Goptapa area, where about 15 gravel mines are working at the same time, and as a result an enormous area has been affected. Apparently in 1970s this area was a forest, but now you can hardly you can see any trees. |
|  | ***Objective 1.2*** | *By 2017, gravel mining operations are licensed and in compliance with environmental rules* | |
|  |  | *Strategic action 1.2.1* | *Pursue steps to encourage stronger regulations and compliance within the mining sector regarding riparian and in-stream gravel mining* |
|  |  | Action Step #1 | Find out who is responsible for giving gravel mines licenses, and document the number and location of legal and illegal operations. |
|  |  | Action Step #2 | Review current permitting and licensing rules as enforcement/compliance activities of relevant authorities and develop recommendations for improvement |
|  | ***Objective 1.3*** | *By 2020, riparian and in-stream habitats and functions have been restored* | |
|  |  | *Strategic action 1.3.1* | *Develop & Implement a restoration plan with local and government stakeholders to repair damage to riparian and in-stream habitats caused by previous gravel mining operations.* |
|  |  | Action Step # 1 | Designate an area for a pilot restoration program that demonstrates a number of alternative restoration techniques |
|  |  | Action Step # 2 | Document restoration techniques and conduct training and capacity building programs for government agencies, gravel mining operation owners/staff and restoration professionals |

**2) The following strategic actions and action steps have been identified for Strategic Objective 2.1 to address Municipal Sewage and wastewater issues:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Threat 9. Pollution: Municipal Sewage and wastewater** | | | |  |
|  | ***Objective 2.1*** | *By 2020, eliminate municipal sewage, wastewater and garbage pollution from entering untreated into local waterways from major towns and cities in Sulaimani* | |  |
|  |  | *Strategic action 2.1.1* | *Implement an Awareness program* |  |
|  |  | Action Step #1 | Document, photograph, GPS locate and map all sources of municipal sewage and wastewater to local waterways |  |
|  |  | Action Step #2 | Publish a report on major municipal pollution inputs to local waterways in Sulaimaniyah, Dukan, Said Sadiq and Darbandikhan that list recommendations for solutions and present to the Kurdistan Environment Board/Ministry of Environment and other government stakeholders and replease publically in a press conference |  |
|  |  | Action Step #3 | Publish and promote information (brochure, information booth, presentations) on waste handling options and alternatives |  |
|  |  | *Strategic action 2.1.1* | *Implement small scale pilot projects to address municipal sewage and garbage issues* |  |
|  |  | Action Step #1 | Develop a pilot project wastewater garden/constructed wetland to demonstrate small scale methods to address sewage pollution |  |
|  |  | Action Step #2 | *Work with the municipality of Suliamani and other towns to develop recycling pilot projects* |  |

**3) The following strategic actions and action steps have been identified for Strategic Objectives 3.1 and 3.2 to address Garbage dumping at the village level and by picnickers and the general public.**

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| --- | --- | --- | --- | --- |
| **Threat 9. Pollution: Garbage dumping from villagers, picnickers and general public** | | | |  |
|  | ***Objective 3.1*** | *By 2020, garbage dumping along rivers and in natural areas has been eliminated.* | |  |
|  |  | *Strategic Action 3.1.1* | *Develop an awareness and outreach program* |  |
|  |  | Action Step #1 | Outreach is really important around the villages and picnic areas. This could be in the form of a performance, or giving out information to encourage people to be responsible for the area they use by the river bank. |  |
|  |  | Action Step #2 | Taking the educational film (The Waterkeeper) to villages that are near the river. |  |
|  |  | Action Step #3 | Make sure that the government provide garbage bins and pick-up services at busy tourist areas (particularly during Nawruz/spring) |  |
|  |  | Action Step #4 | Develop alternative enviro-ed signs and post on billboards along roads |  |
|  | ***Objective 3.2*** | *By 2015, local streams and tributaries cleared of garbage* | |  |
|  |  | *Strategic Action 3.2.1* | *Implement an "Adopt A Stream" Waterkeeper volunteer program and encourage expanions of the program and adoption of stream sections by other groups* |  |
|  |  | Action Step #1 | Select a specific site in Dukan that is annually visited for Clean up activities at various times of the year. |  |
|  |  | Action Step #2 | Conduct a census of the types and amounts of different garbage cleaned up during these activities and provide a public report |  |
|  |  | Action Step #3 | Develop a brochure on how to create similar programs in other locations and promote in other waterways and basins |  |
|  |  | *Strategic Action 3.2.2* | *Encourage the recycling of various waste streams (i.e. plastics/nonbiodegradable, food and organic wastes/biodegradable) in collaboration with local municipalities* |  |
|  |  | Action Step #1 | *Work with the municipality of Suliamani and other towns to develop recycling pilot projects* |  |

**4) The following strategic actions and action steps have been identified for Strategic Objectives 4.1 and 4.2 to address Garbage dumping at the municipal level and from commercial businesses as well as large scale illegal dumping:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Threat 9. Pollution: Municipal garbage dumps / Garbage and other pollutants from small business and “illegal dumping”** | | | |  |
|  | ***Objective 4.1*** | *By 2020, problems and issues around garbage dumping clear to stakeholders and alternatives are being considered* | |  |
|  |  | *Strategic Action 4.1.1* | *Develop an awareness and outreach program to municipalities and local businesses* |  |
|  |  | Action Step #1 | Develop a brochure about proper waste handling |  |
|  |  | Action Step #2 | Work with KEPIB to develop guidelines for municipalities |  |
|  |  | Action Step #3 | Work with municipality of Suliamani and others to develop incentive programs for businesses |  |
|  |  | Action Step #4 | Implement an Award program for the "Worst Polluters/Garbage Dumpers" … with specific categories such as "worst polluting restaurant", etc (or do a top 10 list) and publically present these awards. |  |
|  |  | Action Step #5 | Create a media campaign that focuses on the top "garbage dumpers" with Hawlati newspaper, NRT or KNN and other media outlets |  |
|  |  | *Strategic Action 4.1.2* | *See Strategic Action 3.2.2* |  |
|  | **Objective 4.2** | *By 2020, garbage dumping along rivers and in natural areas has stopped.* | |  |
|  |  | *Strategic Action 4.2.1* | *Better rules and enforcement in place to control both legal and illegal dumping* |  |
|  |  | Action Step #1 | Research existing rules, regulation and enforcement patterns that govern garbage dumping at the municipal level and for small businesses (eg. restaurants, etc.) |  |
|  |  | Action Step #2 | Work with KEPIB to develop guidelines for municipalities |  |
|  |  | Action Step #3 | Work with the KEPIB and municipal stakeholders to implement pilot programs for waste handling |  |
|  |  | Action Step #4 | Consider legal action against "Worse Polluters/Garbage Dumpers" |  |

**5) The following strategic actions and action steps have been identified for Strategic Objectives 5.1 and 5.2 to address Industrial wastes:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Threat 9. Pollution: Industrial Wastes (Tar factories, oil refineries, cement block factories, and chicken factories )** | | | |  |
|  | ***Objective 5.1*** | *By 2015, industrial facilities aware of laws and regulations, and limits on releases to which they must comply* | |  |
|  |  | *Strategic Action 5.1.1* | *See Strategic Action 4.1.1* |  |
|  | ***Objective 5.2*** | *By 2015, Waterkeepers Iraq will initiate a legal program* | |  |
|  |  | *Strategic Action 5.2.1* | *IUTW will work with the Environmental Protection Board towards taking court action against worst operators* |  |
|  |  | Action Step #1 | Hire an environmental lawyer and conduct a review of environmental laws & regs and how they are currently implementation in the Kuristan Region. |  |
|  |  | Action Step #2 | Create a help desk for industries to provide legal assistance on what they must do to comply with existing regulations |  |
|  |  | Action Step #3 | Research a list of potential target polluters and the options for pursuit of legal action against each; identify pros and cons and develop a strategy for a potential suit |  |
|  |  | Action Step #4 | Find out where factory waste goes and if it is possible to take water samples to see how the water has been affected from the factories to build cases against polluting industries |  |
|  |  | Action Step #5 | Implement a pilot legal action against a selected polluter from the targeted list prepared with the KEPIB |  |

**6) The following strategic actions and action steps have been identified for Strategic Objectives 6.1 and 6.2 to address Fish farms:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Threat 9. Pollution & Threat 7. Natural Systems Modification: Fish farms** | | | |  |
|  | ***Objective 6.1*** | *By 2015, local and government stakeholders are aware of threat from fish farming along rivers* | |  |
|  |  | *Strategic Action 6.1.1* | *Implement an Awareness program* |  |
|  |  | Action Step #1 | Conduct research into how these activities are designed, liscenced, developed and managed. |  |
|  |  | Action Step #2 | Publish a report on fish farming in Kurdistan and release to stakeholders and the public |  |
|  |  | Action Step #3 | Develop a brochure to fish farm operations on best practices |  |
|  | ***Objective 6.2*** | *By 2020, make sure that all such river-side activities have a liscence and are being operated properly* | |  |
|  |  | *Strategic Action 6.2.1* | *See Strategic Action 5.2.1* |  |

**7) The following strategic actions and action steps have been identified for Strategic Objectives 7.1 and 7.2 to address Car washing:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Threat 9. Pollution & Threat 7. Natural Systems Modification: Car Washing** | | | |  |
|  | ***Objective 7.1*** | *By 2015, general public are aware of threat from car washing* | |  |
|  |  | *Strategic Action 7.1.1* | *Implement a Car Washing Awareness Raising Campaign* |  |
|  |  | Action Step #1 | Develop a PSA on car washing and its impacts |  |
|  |  | Action Step #2 | Conduct outreach activities at popular places for car washing |  |
|  |  | Action Step #3 | Develop a cooperative relationship with legitimate car washing facilities in these activities. |  |
|  |  | Action Step #4 | Develop educational signate in popular places for car washing |  |
|  | ***Objective 7.2*** | *By 2018, car washing in streams and rivers is stopped and anyone who does this is fined* | |  |
|  |  | *Strategic Action 7.2.1* | *Block access to areas where car washing has occurred* |  |
|  |  | Action Step #1 | Work with local authorities to place ecsthectically pleasing fencing, soil berms and large rocks to block off access of cars to the river (i.e. Salaam Bridge near Said Sadiq) - turn these area into picnic locations |  |
|  |  | *Strategic Action 7.2.2* | *Car washing subject of fines that are enforced* |  |
|  |  | Action Step #1 | Capacity building program for enforcement and regulator agencies |  |
|  |  | Action Step #2 | See Strategic Action 5.2.1 |  |

**8) The following strategic actions and action steps have been identified for Strategic Objectives 8.1 and 8.2 to address illegal fishing methods:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Threat 5. Over-exploitation: Illegal fishing- electric fishing, poison, bombing.** | | | |  |
|  | ***Objective 8.1*** | *By 2015, general public and agency stakeholders are aware of threat for unsustainable fishing practices* | |  |
|  |  | *Strategic Action 8.1.1* | *Implement a Sustainable Fisheries Campaign* |  |
|  |  | Action Step #1 | Develop a PSA on unsustainable fishing practices |  |
|  |  | Action Step #2 | Develop a public brochure on these and more sustainable practices as well as rules that apply to fishing |  |
|  |  | Action Step #3 | Conduct outreach & education activities along rivers for local fishermen |  |
|  | ***Objective 8.2*** | *By 2018, unsustainable fishing practices are subject to tough fines and have been eliminated for local waterways* | |  |
|  |  | *Strategic Action 8.2.1* | *Build capacity of Forestry Police as well as fishermen on sustainable hunting rules* |  |
|  |  | Action Step #1 | Conduct education programs for Forestry Police on fishing rules and how to enforce them |  |
|  |  | Action Step #2 | Encourage the formation of local fishermen associations who can encourage compliance with their members to fishing rules |  |

**9) The following strategic actions and action steps have been identified for Strategic Objectives 9.1, 9.2 and 9.3 to address threats from smuggling:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Threat 9. Pollution & Threat 4. Transportation: Smuggling** | | | | |
|  | ***Objective 9.1*** | *By 2018, general public and agency stakeholders are aware of threat from smuggling (pollution and related transportation impacts to the river)* | |  |
|  |  | *Strategic Action 9.1.1* | *Implement an Awareness program* |  |
|  |  | Action Step #1 | Encourage media reporting of the issue and bring more attention to what is happening in the border areas |  |
|  |  | Action Step #2 | Develop PSA and conduct outreach activities in the border areas to raise awareness |  |
|  | ***Objective 9.2*** | *By 2020, locals have economic alternatives to smuggling* | |  |
|  |  | *Strategic Action 9.2.1* | *Develop socio-economic options for local people in the border regions* |  |
|  |  | Action Step #1 | Develop socio-economic pilot projects (e.g. eco-tourism projects such as horse-back riding programs, mountaineering programs, etc.) |  |
|  | ***Objective 9.3*** | *By 2025, smuggling threats are subject to greater controls* | |  |
|  |  | *Strategic Action 9.3.1* | Develop more cross-border cooperation between NGOs & authorities working in the border zones |  |
|  |  | *Action Step #1* | Develop joint campaign on border environment with Iranian NGOs |  |
|  |  | *Action Step #2* | Through Iranian NGOs develop more opportunities for dialogue about border smuggling with Iranian and KRG authorities |  |
|  |  | *Action Step #3* | Develop strong ties and help build capacity of border and forestry police to control environmental impacts related to smuggling |  |

**10) The following strategic actions and action steps have been identified for Strategic Objectives 10.1 and 10.2 to address threats from the building of small and large dams:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Threat 7. Natural Resource Modification: Building of small and large dams** | | | |  |
|  | ***Objective 10.1*** | *By 2015, general public & government stakeholders are aware of threat from dams and diversion projects* | |  |
|  |  | *Strategic Action 10.1.1* | *Implement a Dam Awareness Campaign* |  |
|  |  | Action Step #1 | Obtain information on location of all dam projects in the KRG |  |
|  |  | Action Step #2 | Develop a PSA on dams and their pros and cons |  |
|  |  | Action Step #3 | Conduct public debates and media events where pros and cons of dam development are debated |  |
|  |  | Strategic Action 10.1.2 | Connect to regional/national impacts throught the Mesopotamian Outreach Project |  |
|  |  | Action Step #1 | Participated in the Tigris River Flotilla |  |
|  |  | Action Step #2 | Develop a network of Waterkeeper volunteers that will be the eyes and ears of the program throughout the Tigris Basin | |
|  | ***Objective 10.2*** | *By 2018, all dam projects are subject to rigorous EIA requirements* | |  |
|  |  | Strategic Action 10.2.1 | *Make sure that existing rules and regulations are implemented properly* |  |
|  |  | Action Step #1 | Develop a case study of several dam projects in the KRG and investigate how they were handled |  |
|  |  | Action Step #1 | *See Strategic Action 5.2.1* |  |

**11) The following strategic actions and action steps have been identified for Strategic Objectives 11.1 and 11.2 to address threats from animal grazing and farms animals degrading river quality:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Threat 1. Agricultural activities: Animal grazing & access to rivers** | | | |  |
|  | ***Objective 11.1*** | *By 2018, local and government stakeholders are aware of the threat from animal grazing and access to rivers* | |  |
|  |  | *Strategic Action 11.1.1* | *Research and report on this issue to determine the extent of the problem* |  |
|  |  | Action Step #1 | Conduct in-depth case studies to determine the severity of this threat to rivers, biodiversity and water quality and what local attitudes to these issues are. |  |
|  |  | Action Step #2 | Develop a PSA/brochure on best practices for farmers and related stakeholders |  |
|  |  | Action Step #3 | Conduct outreach to the College of Agriculture, Animal Science programs to build capacity and understanding on this issues |  |
|  | ***Objective 11.2*** | *By 2025, access to and grazing in the riparian areas by domestic animals now restricted* | |  |
|  |  | *Strategic Action 11.2.1* | *Build legislatives/regulatory framework to address this issues* |  |
|  |  | Action Step #1 | Examine current framework and identify gaps that should be filled |  |
|  |  | Action Step #2 | Lobby for rules and regulatory changes and updates |  |
|  |  | Action Step #3 | Build capacity for enforcement |  |

**12) The following strategic actions and action steps have been identified for Strategic Objectives 12.1 and 12.2 to address threats from small holder farms:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Threat 1. Agriculture: Small Holder farms (annual, perennial, non-timber, vegetable farming)** | | | |
|  | ***Objective 12.1*** | *By 2020, local and government stakeholders aware of threats from small holder farm encroachment on Iraqi waterways* | |
|  |  | Strategic Action 12.1.1 | *Research and report on this issue to determine the extent of the problem* |
|  |  | Action Step #1 | Conduct in-depth case studies to determine the severity of this threat to rivers, biodiversity and water quality and what local attitudes to these issues are. |
|  |  | Action Step #2 | Develop a PSA/brochure on best practices for farmers and related stakeholders |
|  |  | Action Step #3 | Conduct outreach to the College of Agriculture, Animal Science programs to build capacity and understanding on this issues |
|  | ***Objective 12.2*** | *By 2025, clearance of land along streams and riverways is subject to stronger controls* | |
|  |  | *Strategic Action 12.2.1* | *Build legislatives/regulatory framework to address this issues* |
|  |  | Action Step #1 | Examine current framework and identify gaps that should be filled |
|  |  | Action Step #2 | Lobby for rules and regulatory changes and updates |
|  |  | Action Step #3 | Build capacity for enforcement |

**13) The following strategic actions and action steps have been identified for Strategic Objectives 13.1 and 13.2 to address threats general agro-chemical pollution:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Threat 9. Pollution: Agro-Chemical pollution** | | |  |
|  | ***Objective 13.1*** | *By 2020, farmers and local government stakeholders aware of threats from agricultural pollution (herbicide, pesticide, animal waste and sediment runoff)* | |
|  |  | Strategic Action 13.1.1 | *Research and report on this issue to determine the extent of the problem* |
|  |  | Action Step #1 | Conduct in-depth case studies to determine the severity of this threat to rivers, biodiversity and water quality and what local attitudes to these issues are. |
|  |  | Action Step #2 | Develop a PSA/brochure on best practices for farmers and related stakeholders |
|  |  | Action Step #3 | Conduct outreach to the College of Agriculture, Animal Science programs to build capacity and understanding on this issues |
|  | ***Objective 13.2*** | *By 2025, agricultural Pollution to streams and waterways is subject to stronger controls* | |
|  |  | *Strategic Action 13.2.1* | *Build legislatives/regulatory framework to address this issues* |
|  |  | Action Step #1 | Examine current framework and identify gaps that should be filled |
|  |  | Action Step #2 | Lobby for rules and regulatory changes and updates |
|  |  | Action Step #3 | Build capacity for enforcement |

# For more Information

Your feedback, thoughts and ideas are most welcome. We also encourage you to contact us and learn more about the Waterkeepers Iraq Program and about Nature Iraq. We welcome new members, volunteers and interns.

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# References

BirdLife International (2006) *Monitoring Important Bird Areas: a global framework.* Cambridge, UK. BirdLife International. Version 1.2. Compiled by Leon Bennun, Ian Burfield, Lincoln Fishpool, Szabolcs Nagy & Alison Stattersfield.