



IMPEL CAED Project

CASE STUDY ON “BIODIVERSITY”

Second Training Session

February 9th, 2022, 9:30 – 13:30 CET, Online training

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CASE DESCRIPTION

First available information/data

- (PRESSURE) A discharge of chemicals (likely herbicide) from agricultural activities into a river (damaging occurrence)
- (PRESSURE) Release of a toxic chemical for water environment
- (DRIVER) Non-Annex III (ELD) activity (water and land damage out of ELD scope)
- (IMPACT) A large fish kill reported
- (IMPACT) Annex II (Habitat Directive) protected species impacted - Brook lamprey (*Lampetra planeri*)



PREVIEW of Practical Tables - OUTPUT

DESCRIPTION and JUDGEMENT OF THE CASE	
Site/location	Fictitious case based on experience
Damaging Occurrence	A discharge of chemicals (likely herbicide) from agricultural activities into a river
Damage Factors	Release of a toxic chemical
Natural Resources Impacted	Protected species - Brook lamprey (<i>Lampetra planeri</i>)
Adverse Effects on Reference Concepts	Unlikely at national level, unknown at local level
Other Available Data/information	---
Overall Judgement	<p>DATA/INFORMATION TO IDENTIFY CLUES OF DAMAGE NOT SUFFICIENT</p> <p>A large fish kill was reported, the cause of which is likely to have been caused by the release of chemical (herbicide) from agricultural activities to the impacted river. As this is a non-Annex III activity, only damage to protected species and natural habitats is applicable. An Annex II protected species has been impacted. The species is currently of favourable conservation status nationally and it is unlikely that this event has had an adverse impact on that status. There is no baseline data available at a local level and therefore further investigation is required to determine whether environmental damage has occurred on a local scale.</p>
Further Investigations Required	Survey of brook lamprey in the impacted river and at reference locations to estimate a baseline to facilitate an assessment of the effect of the fish kill on the local population. Further investigations may be prescribed based on the outcome of this survey.

Data/information to identify clues of damage not sufficient, but there is a need of collecting/requiring further data/information through further investigations



IMPACT (Adverse effects)

OBJECTIVE Evaluate the relevance, reliability and quality of data / information on the impacts collected after the damaging occurrence



EVALUATION

Adequate to identify potential clues for ELD

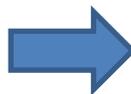
Main “indicators” referring to the objective

INDICATOR	DESCRIPTION	NOTES
Type of impacted area	Unprotected area	✓
Type of impact	Direct (adverse effects on the natural habitat or protected species)	Discharge of chemical to river
Distance and pathway of the event to the natural habitats, protected species, habitat for species, species typical for a natural habitat	Distance to nearest protected species/natural habitat (specify)	Within a few hundred meters of a number of protected lamprey species
Scale of the assessment (multiple assessment scales possible)	<ul style="list-style-type: none"> Biogeographical/national/European level (Large scale assessment) Local/site level (Local scale assessment) 	National River/catchment
Adequacy of Quality Assurance and Quality Control principles (considers Data Quality indicators such as: Precision, bias, accuracy, representativeness, comparability, completeness, detectability (which includes sensitivity and specificity))	Adequate (Specify why)	Assessments and surveys completed in accordance with best practice

IMPACT (Adverse Effects)

EVALUATION (LARGE SCALE ASSESSMENT)

OBJECTIVE Evaluate the existence of negative impacts on species which may affect maintaining or pursuing a favourable conservation status



Unlikely to be considered as environmental damage on a national scale

Main “indicators” referring to the objective

INDICATOR

DESCRIPTION

NOTES

Adverse variation of the population of the species

Unlikely

✓

Adverse variation of other parameters included in the Reporting forms (related to species) on biodiversity of the Habitat Directive

Unlikely

✓

OBJECTIVE

Evaluate the existence of negative impacts on species/bird species which may affect maintaining or pursuing a favourable conservation status



EVALUATION (LOCAL SCALE ASSESSMENT – Outside Natura 2000 sites)

Further investigation required at local level

Adverse variation of the rarity/peculiarity of the species

Data not available

✓

Adverse variation in the resilience (recovery capacity) of species (Specify time expected for recovery to baseline status)

Data not available

✓

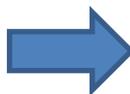
Adverse variation of other ecological parameters for the change in condition of the species

- Unlikely
- Data not available

✓

STATE (Baseline Conditions)

OBJECTIVE Evaluate the relevance, reliability and quality of data / information collected on the baseline



EVALUATION

Some data available at a national level but inadequate data at a local level. Further information needs to be gathered to establish/estimate a baseline at local level

Main "indicators" referring to the objective

INDICATOR	DESCRIPTION	NOTES
Availability of the conservation status and/or other reference values (specify also whether the data/information is adequate, inadequate, further information needed)	<ul style="list-style-type: none"> At National level At local/site level 	<ul style="list-style-type: none"> Favourable Unknown
Adequacy of Quality Assurance and Quality Control principles (considers Data Quality indicators such as: Precision, bias, accuracy, representativeness, comparability, completeness, detectability (which includes sensitivity and specificity))	Adequate (specify why)	Survey methodology in accordance with best practice (Common Standards Monitoring guidance for freshwater fauna (INCC, 2015)) completed by competent persons

OBJECTIVE Know the baseline of the species



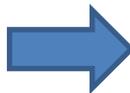
EVALUATION

Some data available at a national level but inadequate data at a local level. Further information needs to be gathered to establish/estimate a baseline at local level

INDICATOR	DESCRIPTION	NOTES (NATIONAL LEVEL)	NOTES (LOCAL/SITE LEVEL)
Classification of the species based on the level of extinction risk	<ol style="list-style-type: none"> LC, Least Concern Specify if the species are included in the National Red List and European Red List 	<ol style="list-style-type: none"> ✓ Yes 	-
Conservation status	Favourable	✓	Unknown
Trend of conservation status	Stable	✓	Unknown

PRESSURE (Damaging occurrence and damage factor)

OBJECTIVE Describe the general characteristics and evaluate relevance, reliability and quality of data/information on the damaging occurrence and/or damage factors



EVALUATION

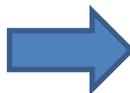
Overall clear clues of environmental damage as fish kill includes a large number of protected species over a large area and further investigation by way of chemical analysis of river, dead fish and sediments warranted. Water damage does not apply as non-Annex III occupational activity.

Main "indicators" referring to the objective

INDICATOR	DESCRIPTION	NOTES
Type of damaging occurrence	Accident/Incident (specify it)	<i>Release of toxic chemical to local river</i>
Timeline of the damaging occurrence	Ceased	<i>Appears to have ceased but sediment sampling possibly required to ensure that there was no adsorption of chemical to sediments which may release over time</i>
Natural resource impacted by the damaging occurrence	Protected habitats or species	<i>Estimated >10,000 fish killed over 5km stretch of river, majority of which were brook lamprey (<i>Lampetra planeri</i>)</i>
Location of the damaging occurrence	(Specify geographical coordinates and any useful information to demonstrate a connection with the site or route of the occupational activity)	<i>River adjacent to where recent spraying of herbicide appears to have taken place</i>
Spatial extent of the damaging occurrence and damage factors	Localised/Point source (specify it)	<i>Hosepipe from land entering river where fish kill appears to have originated</i>
Accuracy and reliability of data including sampling and analysis, procedures and quality assurance	Adequate (Specify why)	<i>Estimate of geographical extent of fish kill made by walking the impacted river, with an extrapolated best estimate of numbers of fish killed taken from a number of counts along the impacted stretch using best practice guidance for response to such incidents. A number of dead specimens retrieved and stored as per best practice. River samples taken at intervals upstream, in impacted stretch of river and downstream in accordance with best practice, stored adequately with appropriate chain of custody records</i>
	Not adequate (specify why)	<i>Further analysis of water, sediments and dead fish required to strengthen link to causal discharge of toxic chemicals</i>

PRESSURE (Damaging occurrence and damage factor)

OBJECTIVE Evaluate the potential harmfulness of the damaging occurrence and/or damage factors



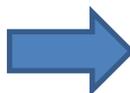
EVALUATION

A number of unknown factors but some general assumptions made based on likelihood that a release of herbicide was responsible for the fish kill. Further investigation required to confirm chemical form of herbicide and including the solubility/adsorption of the chemical

Main "indicators" referring to the objective

INDICATOR	DESCRIPTION	NOTES
Origin of chemicals/inorganic materials/organic materials/nutrients/organisms/microorganisms	Synthetic origin	<i>Likely to be a synthetically manufactured herbicide</i>
Intrinsic hazard of substances and mixtures / microorganisms introduced	Substances classified as toxic for the aquatic organisms	<i>Herbicides are generally toxic to aquatic organisms</i>
	Safety data sheets available	<i>Likely but to be determined</i>

OBJECTIVE Evaluate the efficiency of containment/mitigation measures



EVALUATION

Direct discharge to river with no apparent containment or mitigation

Effectiveness of implemented containment/mitigation measures	Not effective (specify why)	<i>Direct discharge</i>
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DRIVER (Occupational Activity)

OBJECTIVE Describe the general characteristics of the occupational activity with respect to the damaging occurrence/damage



EVALUATION

Non-Annex III activity. Further investigation required to determine if there was fault of negligence but it is considered likely. Causal link seems likely from placement of hose on ground and grassland spraying immediately prior to impact (fish kill).

INDICATOR factors/adverse effects observed

DESCRIPTION

NOTES

Proof that the damaging occurrence was caused with fault or negligence (to be compiled only for occupational activities not included in Annex III)	Data/information not available	<i>Unknown as yet but likely as well known agricultural contractor used for the work. Further investigation (interviewing of farmer and contractors) required</i>
Risk of the occupational activity for natural habitats and protected species or surface waters or groundwater or land (only affected resources have to be considered)	Occupational activity considered to present a risk for natural habitats and protected species or surface waters or marine and coastal waters or groundwater or land (only affected resources have to be considered)	<i>Mismanagement of chemicals used for spraying of chemicals (likely herbicide) on grasslands presents a risk to surface water, fisheries and associated services</i>
Location of the occupational activity and connection to the site of the damaging occurrence/damage factors/adverse effects (in case of transportation activity, indicate the location of the damage)	(Specify geographical coordinates and any useful information of the site of the occupational activity to demonstrate a connection with the site of the damaging occurrence/damage factors/adverse effects: e.g. onshore/offshore, upstream, upwind, adjacent with, overlying, etc.)	<i>Hose observed on the ground where the tanker appears to have washed residual chemical contents directly into the local river</i>

OBJECTIVE Evaluate the environmental management performance of the occupational activity with respect to the damaging occurrence/damage factors/adverse effects observed



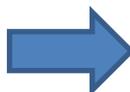
EVALUATION

Further investigation required to correctly identify operator and link chemical release to impact

Current and previous operational status of the equipment/installation which may have caused the damaging occurrence/damage factors/adverse effects observed	Not in operation (specify it)	<i>Spraying of grasslands appeared to have been completed but a hose remained on the ground leading into the local river</i>
	Data/information not available	<i>Not known - further investigation needed as may provide evidence of negligence or fault</i>

DRIVER (Occupational Activity)

OBJECTIVE Evaluate the link between the occupational activity and the adverse effects



EVALUATION

Causal link likelihood but further collection and analysis required as above

INDICATOR

DESCRIPTION

NOTES

Consistency of substances and quantities used / handled / produced by the occupational activity with the damage factors/adverse effects

Consistent with the characteristics of the damage factors/adverse effects

Observed effects appear consistent with exposure to a toxic chemical but testing of dead fish/further chemical analysis of watercourses and possibly sediments required, in addition to testing of hosepipe contents if possible. 10,000 liters of agricultural tankers observed in the area immediately prior to the fish kill by locals interviewed.

Presence of other activities which could be associated with the damaging occurrence/damage factors or the type of damage factors/adverse effects

No (specify why)

Unlikely other activities involved as hosepipe observed entering river immediately upstream of where fish kill appears to have occurred

KEY RESULTS OF THE SCREENING PROCESS and DETERMINATION OF CLUES

- The case complies with the applicability requirements of the ELD
- *The responsible for the event is an occupational activity not listed in Annex III.*
 - *Natural resource involved is a protected species under Annex II of Habitat Directive.*
 - *The event occurred within the time scope of ELD.*

There is unlikely to be a significant adverse impact on the favourable conservation status at national level as a result of this incident, however, there is a lack of data at local level and some further investigation is necessary to determine the current and baseline status of lamprey in the impacted river

A large number of lamprey were killed in this fish kill. On average the numbers lost expressed in density over the impacted area are 0.4 individuals/m². This is unlikely to be significant at a national level but further information is needed to determine the significance at a local level. Due to the lack of baseline data at a local level, a post incident survey of the impact area, and a number of reference locations, is required to establish the significance of the impact in the context of the ELD

A number of clear clues of damage to protected species and natural habitats likely to be linked to discharge of chemical from agricultural activities. Further investigation required without delay to identify speciation of herbicide likely to have been used immediately prior to the fish kill. Knowledge of the properties of the chemical will assist in determining what additional sampling and analysis is required (e.g. sediment sampling) and the potential for leaching from sediment back into the environment if the herbicide may have been absorbed into river sediments

Clues of environmental damage include: hose pipe indicating causal link from non-Annex III activity which is likely to have released a chemical into the local river at a point where a fish kill appears to have occurred. Further investigation required however to clearly identify operator and whether negligence/fault can be demonstrated. As non-Annex III activity only potential impact on NPHS is relevant. 2 of the fish species impacted as Annex II species

Practical Tables - OUTPUT

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