Workshop – "River management in a climate change context: challenges and opportunities"

Following the efficiency of hydromorphological river restoration works (HRRW)

Focus on two yards in the Artois Picardie water basin

The Hem river 's « lab » and the Course river

Stéphane JOURDAN and Jean-Luc CARPENTIER
Artois – Picardie Water Basin Agency
Marlène Roland-Meynard, Anne VIVIER and Sophie TUAUX
French Biodiversity Agency

Crédit photographique: FDAAPPMA 62 (2020)

N

CALAIS

BOULOGNE SUR MER

SAINT OMER

BETHUNE

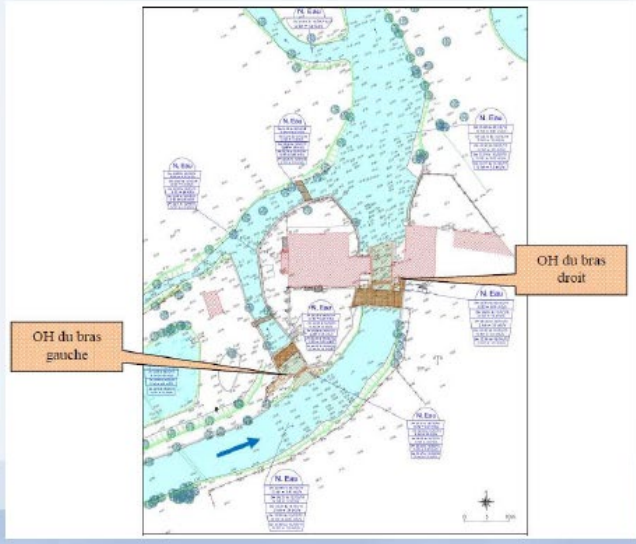
MONTREUIL

http://aeap.maps.arcgis.com/apps/View/index.html?appid=1ec73bb2a5864ae5a4ceb8e0a3f39648

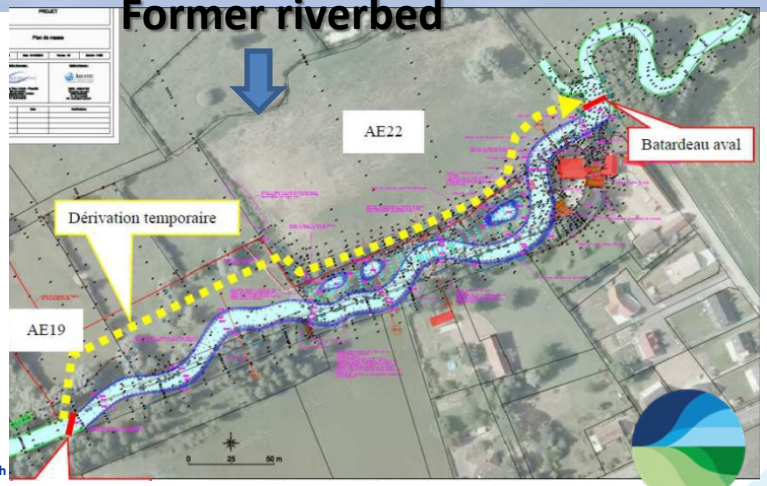
https://www.parc-opale.fr/images/bibliotheque/PDFentelechargement/Recueil_experience_HEM_BD.pdf

Dam removal on the Hem river (Tournehem-sur-la-Hem)

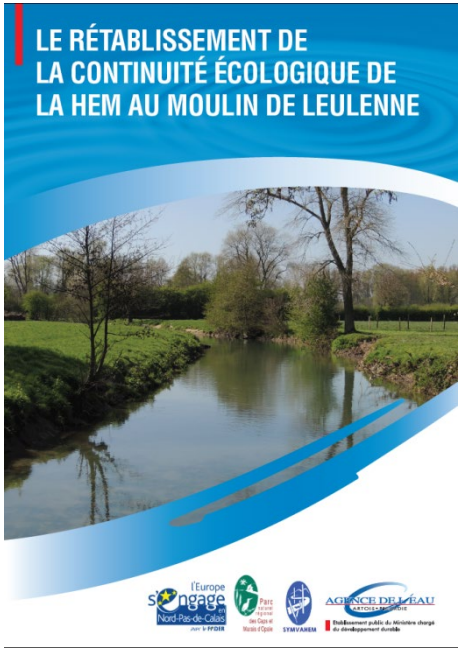
OH du bras gauche



OH du bras droit

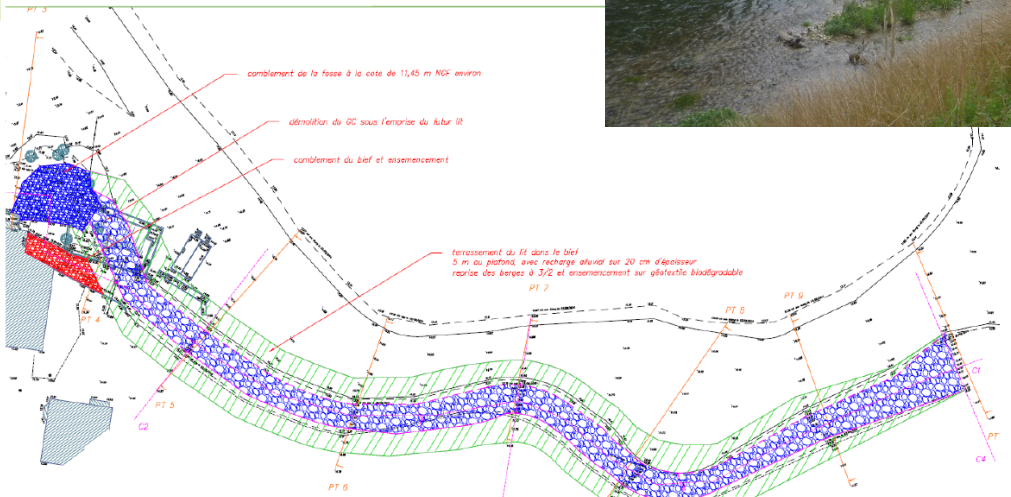


Fears for floods after dam removal


LE RÉTABLISSEMENT DE
LA CONTINUITÉ ÉCOLOGIQUE DE
LA HEM AU MOULIN DE LEULENNE
AGENCE DE L'EAU


Effacement total ou partiel d'ouvrage transversal
Effacement de l'ouvrage du Moulin de la Leuleune et restauration hydromorphologique sur la Hem
OFB
OFFICE FRANÇAIS DE LA BIODIVERSITÉ
L'opération
La localisation
Tournehem-sur-la-Hem
Bassin Artois-Picardie
Le cours d'eau dans la partie restaurée
Les objectifs du maître d'ouvrage
• Restaurer les caractéristiques morphologiques de la Hem
• Rétablir la continuité écologique
• Réduire le risque d'inondation
Le milieu et les pressions

Dam removal on the Course river (Montcavrel)



Cariçaie

Cariçaie

sce
Aménagement & environnement

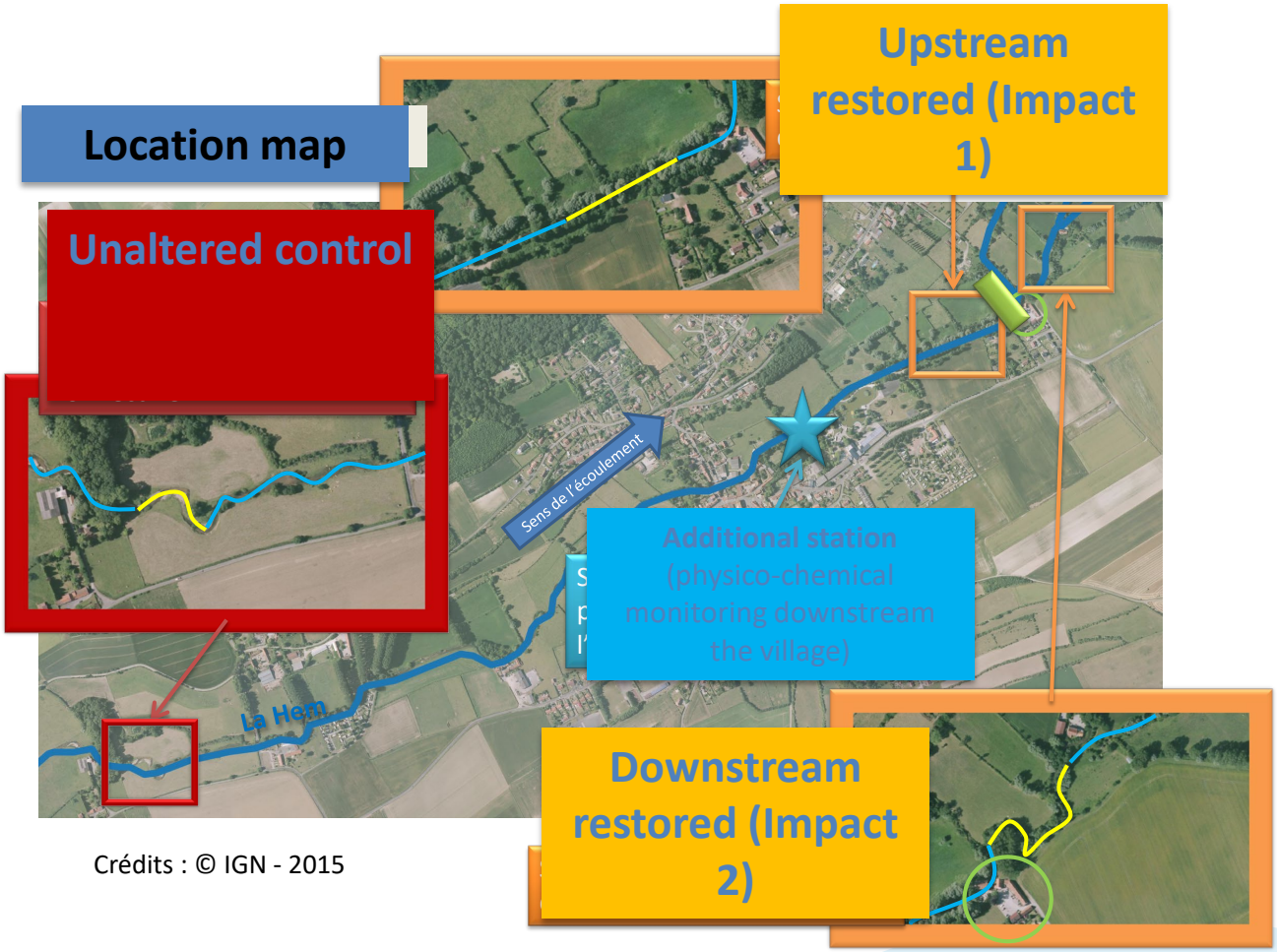
aquascop

Workshop on river

MSM of the Hem river

Hem river (62), a weir removal for migratory fishes and flood control

« BACI » design

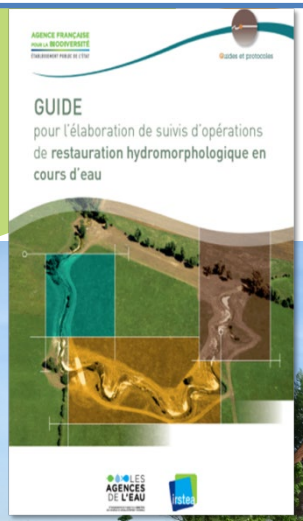


Légende
Moulin de la Leulenne
Ouvrage de la Leulenne
Nouveau tracé

[Film]

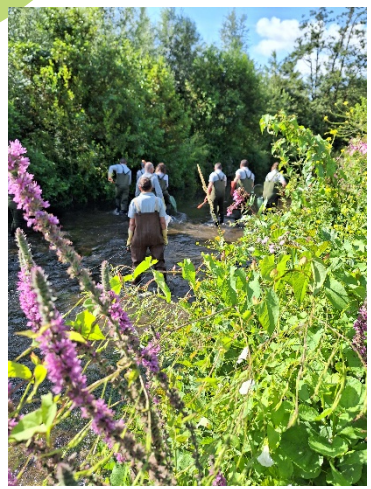
Crédits : © IGN - 2015

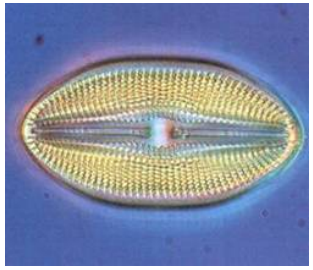
Landscape monitoring



Monitoring the efficiency

Biology





Morphology

cbn
CONSERVATOIRE
BOTANIQUE NATIONAL
BAILLEUL

RÉPUBLIQUE FRANÇAISE
Liberté
Égalité
Fraternité

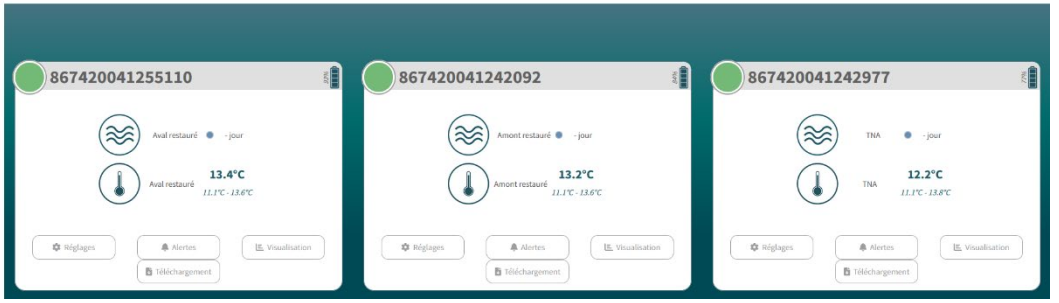
AGENCE DE L'EAU ARTOIS-PICARDIE

Temperature

Temperature measurement probe On the Course River

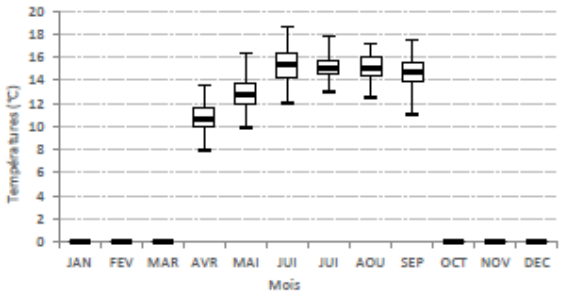
SQUAMA
Suivis Qualitatif & Quantitatif des Milieux Aquatiques

Tableau de bord | Paramètres | Contact



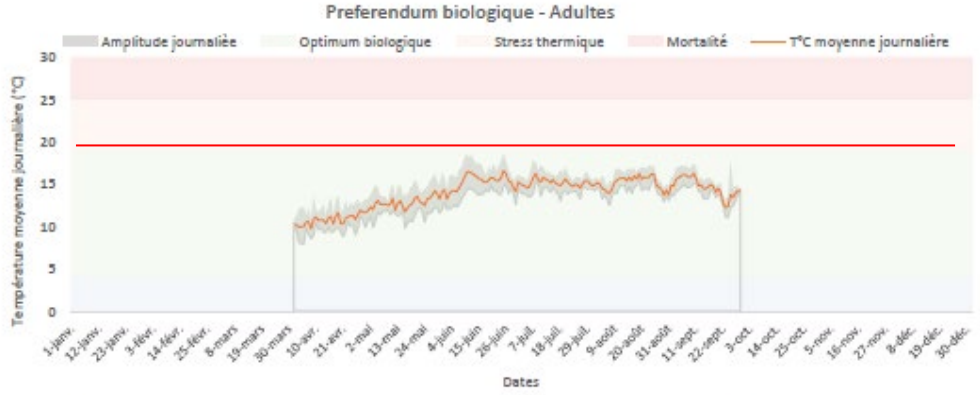
COURSE - Aval Restauré

SYNTHESE ANNUELLE DES DONNEES THERMIQUES 2023

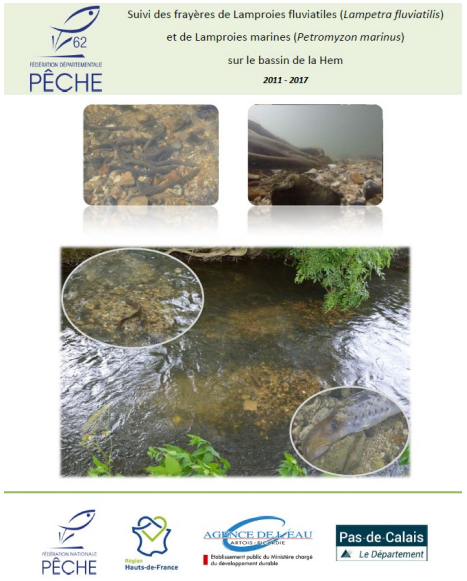


Espèce repère : TRF

Début période	01/04/2023	
Fin période	29/09/2023	181
F_emi	15min	
%_emi	99%	
Nb_exonde	3	0.9%
Ti_min	7.9	2023/04/05 09:00
Ti_max	18.6	2023/06/25 21:00
Amp_G	10.7	-
Tj_min	9.7	08/04/2023
Tj_max	16.6	25/06/2023
Aj_max	5.3	25/09/2023
Tm7j_max	16.1	09/06/2023
Tm30j_max	15.5	09/06/2023



Following fish reproduction efficiency on riffles (on the field and along the banks, with the help of drones)



MSM on the Hem River

1. Sites existants

1. *Effacement du moulin de la Leulenne sur la Hem – 1er résultats avant / après*

Suivi végétation - CBNB

Effets des travaux sur la **qualité des végétations (lit mineur/berges)** → calcul de l'Indice de qualité phytocénotique (IQPC)
Méthode qui permet d'attribuer une note à une portion de cours d'eau en fonction du substrat et des peuplements phanérogamiques aquatiques présents

IQPC	2016	2018
Restaurée amont	**8,79**	**15,17**
Restaurée aval	14,8	15,05
Témoin non altérée	16,83	16,43

Mauvais état à bon état écologique → proche TNA

→ Apparition d'une station de Potamot dense (*Groenlandia densa*) ; espèce aquatique d'intérêt patrimonial à l'échelle des Hauts-de-France

→ Recommandation de gestion : fauche ou pâturage extensif (*sinon boisement nitrophile mésohygrophile de faible intérêt*)

sce
Aménagement & environnement

Suivis Nids de Pontes Migrateurs

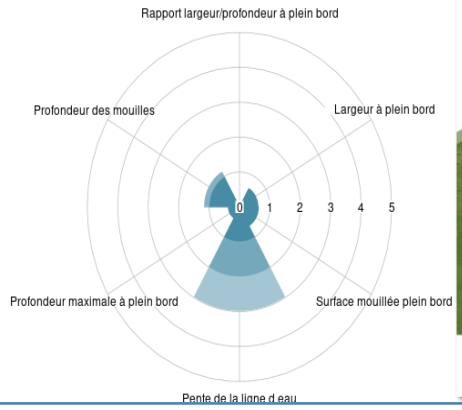
Augmentation du nombre de nids

	2011	2012	2013	2014	2015	2016	2017	2018	2019
GS	10	7	9	12	8	13	28	/	45
LPF	71	74	98	17	47	/	133	156	175
LPM	4	2	0	6	3	/	/	1	/

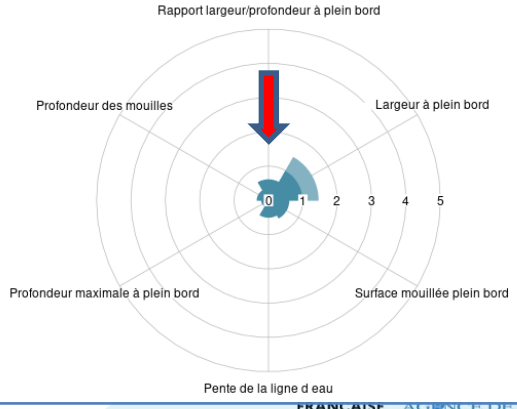
GS	Moyenne **10** nids	Moyenne **35** nids
LPF	Moyenne **60** nids	Moyenne **155** nids

3 X plus de nids depuis le rétablissement de la continuité

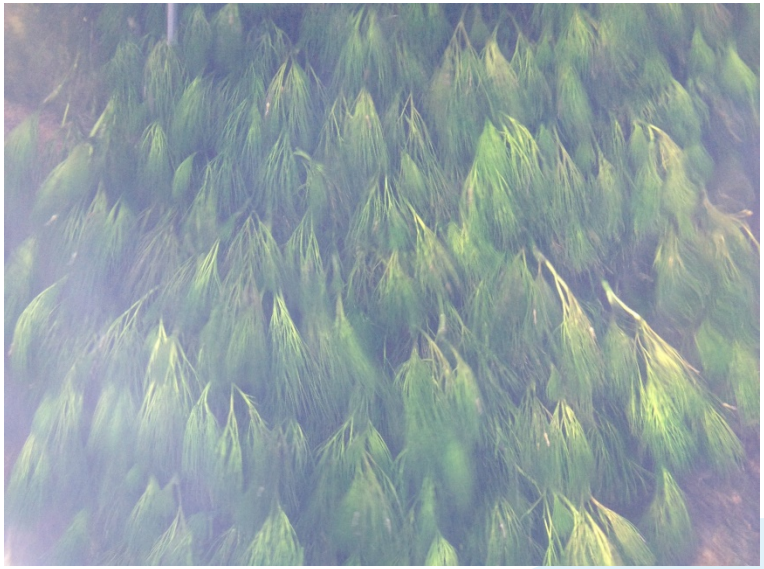
Indicateur Morphologique Global :
HEM ET MEULESTROM A TOURNEHEM SUR LA HEM (62)
IMG = 5.8
Station n°: 01002269; Opération n°: 3014
Date de réalisation : 2017-06-21
Modèle de référence = HER TABLES CALCAIRES



Indicateur Morphologique Global :
HEM ET MEULESTROM A TOURNEHEM SUR LA HEM (62)
IMG = 3.67
Station n°: 01002269; Opération n°: 3526
Date de réalisation : 2019-07-31
Modèle de référence = HER TABLES CALCAIRES



Aquatic flora and fauna (2017-2019-2020-2021-2022)

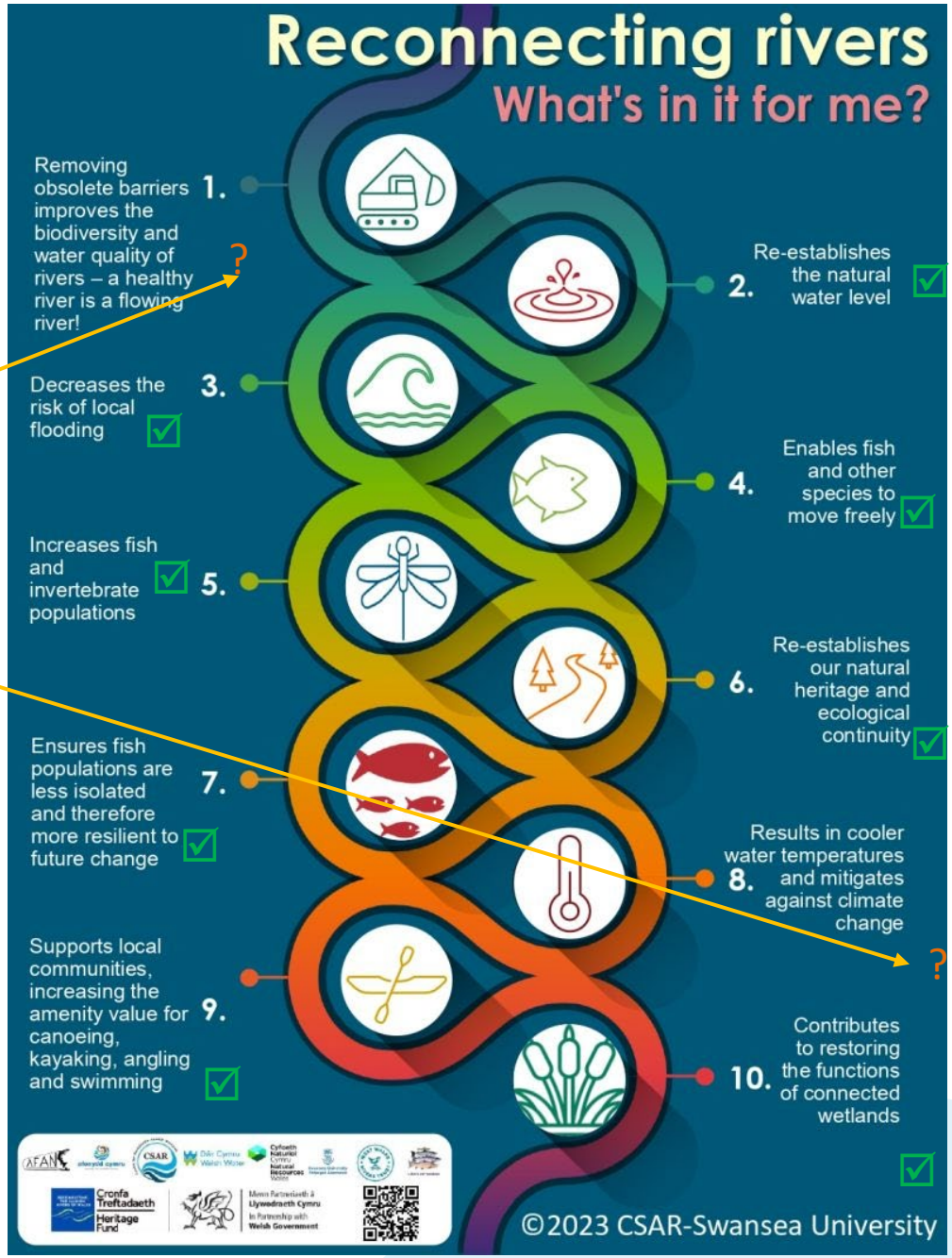


What were we expecting before the yards began ?

The MSM is the tool for the survey of hydromorphological river restoration works

Yes,it is demonstrated in the nearly neighborhood of the yard but eutrophisation of the water basin increases unhappily during the survey, at a larger scale (grasslands reversal). It mitigates the results on the water quality and on the flora surveys, but good results demonstrated thanks to BACI.

The water supply mainly comes from a stream side channel, with water temperatures which are not strongly affected by the “mill reach” effect, especially in summer.



☑ Target reached

? Target uncertain

☑ Target not reached

To conclude

- Efficiency of HRRW always needs to be demonstrated because of adverse stakes – MMS is a good tool for practitionner for this purpose
- Strong and scientific protocole to follow the efficiency of the works
- Long time scale follow – up to 12-15 years forecast (n+5 on the Hem river, n+1 on the Course river)
- For practitionner
  - Contractual obligation of success, but
  - Need to keep the possibility to intervene on the site again, taking into account the efficient flood for river morphology (and biology): works led on the riparian forest in 2022-2023
  - Demonstrate the efficiency could be long and / or uncertain
  - HRRW powerlessness about some impacts, as the effects of climate change and the effects of new impacts as grasslands reversal

- We would like also to thank all the partners involved in these HRRW and SSM
  - Of the design offices, Pierre-François Goujard (Bief-CARICAIE), Damien Delafollye (AQUATEC), Arnaud Moreira Da Silva (SCE) and Agnès Le Hen (Aquascop) and their teams
  - From the Angling Federation of Pas-de-Calais, especially Benoit Rigault and Laetitia Munch for their strong support
  - Elodie Maurice and Julie Robillard from The Natural Park « Caps and Marais d'Opale »
  - Arnaud Rousselle, Emilie Delattre and Valérie Chérigié from the SYMCEA, tying the owner mastery of projects on the Canche (Course) river
  - William Gelez and Remi François, from Bailleul National Botanical Conservatory
  - Our colleagues of the Water Agency also involved in the surveys, Sandrine Traisnel and Hubert Verhaeghe, Dorothée Bolzan, Christophe Lesniak, Amélie Vlandas…
  - Our colleagues of the French Biodiversity Agency, Gaëlle Jardin and Paul-Emilien Toucry
  - and all people I could have forgotten, involved in the projects…

RÉPUBLIQUE FRANÇAISE
Liberté
Égalité
Fraternité

AGENCE DE L'EAU ARTOIS-PICARDIE