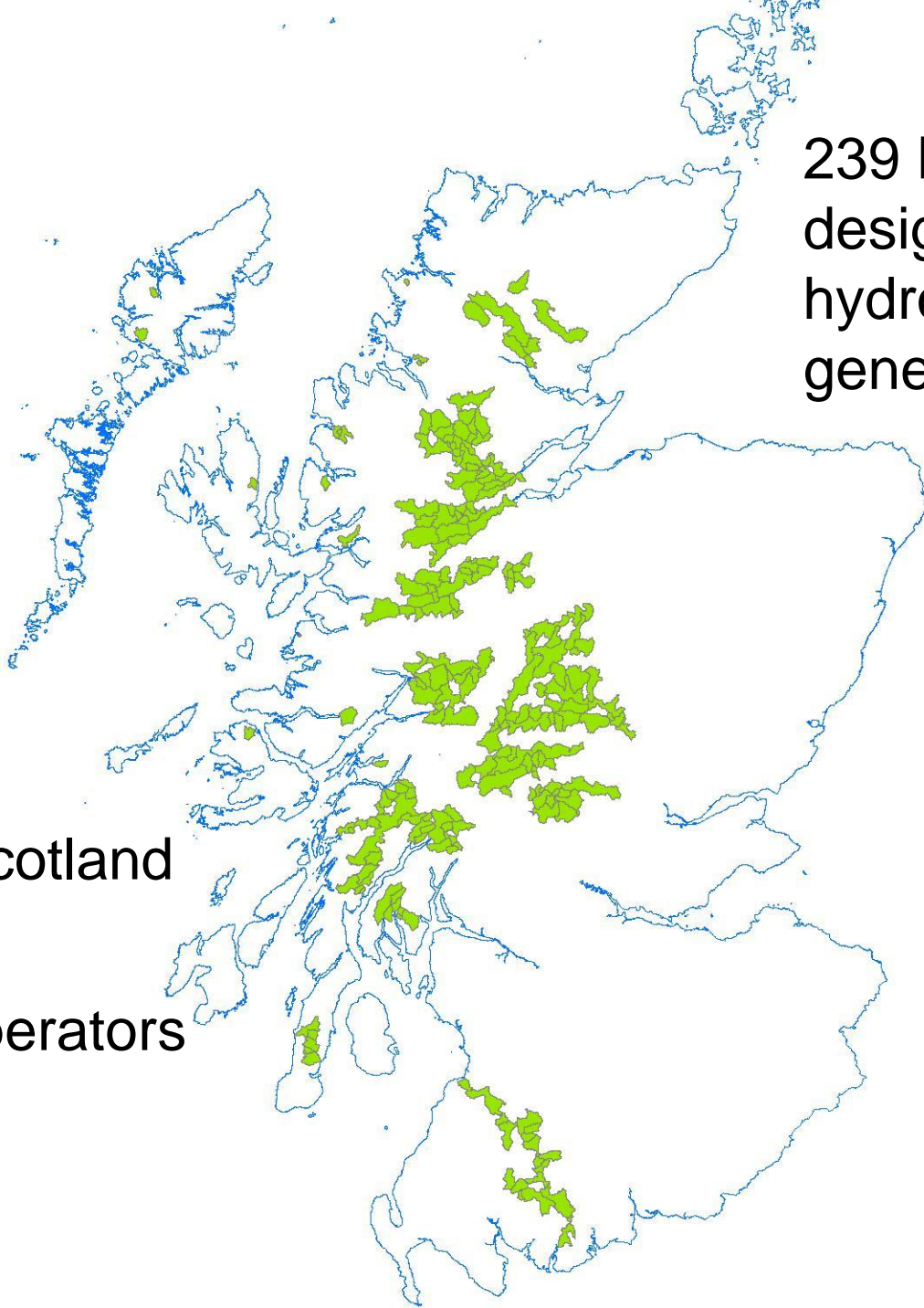


OBJECTIVES AND MEASURES



239 HMWBs
designated for
hydropower
generation in UK



225 in Scotland

Three operators

Process

Competent authority &
operator workshop
(March 08)

Draft objectives

Second workshop with
all interested parties
(April 09)

Finalised objectives

High confidence
objectives

Low confidence
objectives

Operators &
competent authority
agree

Operators &
competent authority
don't agree or
uncertain

Objectives set for large numbers of water bodies

Identified priorities for action

Best estimate of what we expect to achieve

Review and update each cycle

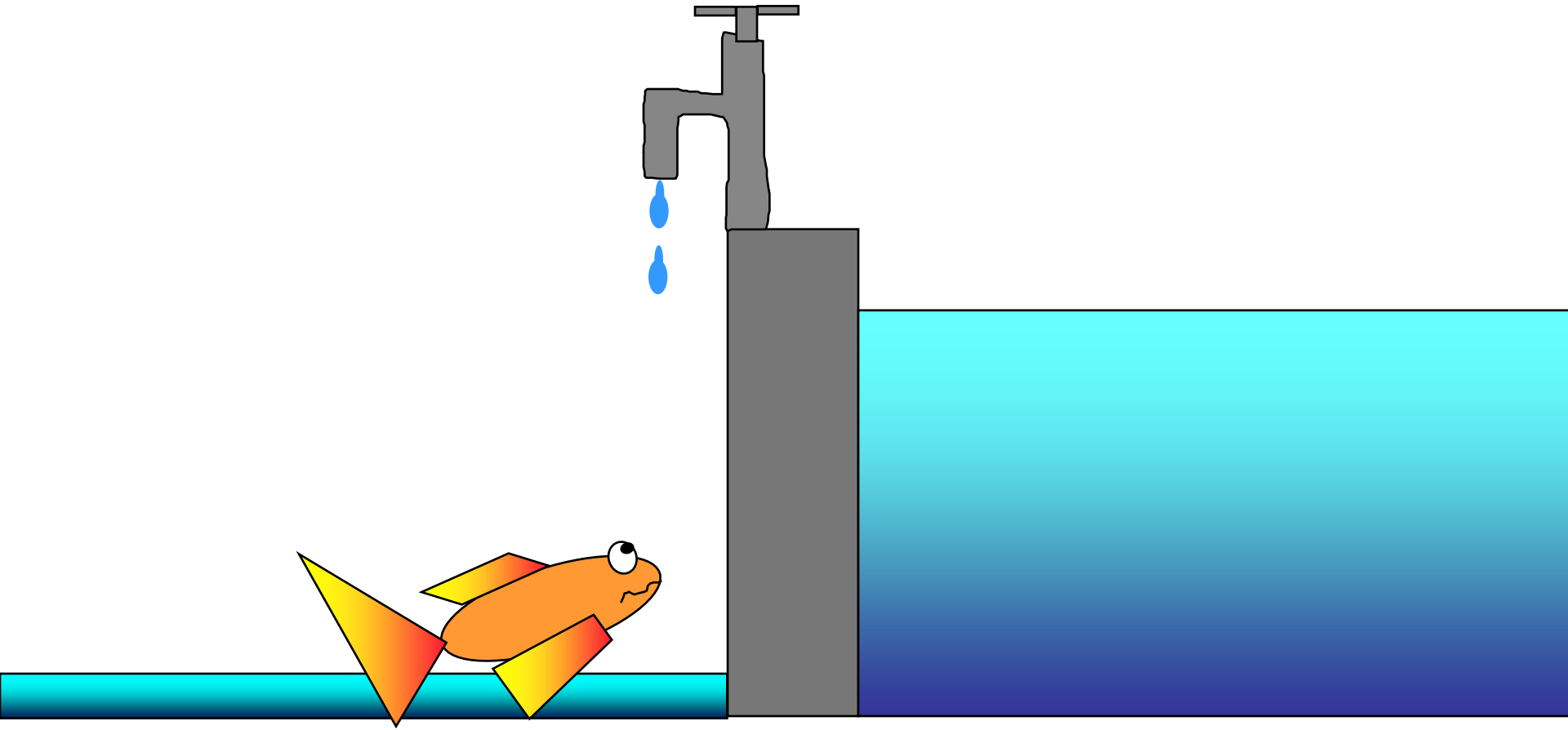
Licence review/variation



Confirm classification & objective	Re-classification	Extended timetable for implementing missing mitigation	Less stringent objective
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“Prague” Method

Measures = missing mitigation



Impact

Fish movement at dam

Reservoir stream access

Downstream flow regime

Downstream morphology

Downstream oxygen
Downstream temperature

Reservoir margins

Impact	Yes?
Fish movement at dam	✓
Reservoir stream access	✗
Downstream flow regime	✓
Downstream morphology	✓
Downstream oxygen	✗
Downstream temperature	✓
Reservoir margins	✓

Impact	Yes?	Mitigation checklist
Fish movement at dam	✓	Fish pass
		Downstream flow for fish
		Risk posed by turbines, screens and intakes managed
Reservoir stream access	✗	Fish access to reservoir streams
Downstream flow regime	✓	Minimum flow (\geq summer low flows)
		Variable additional flows
Downstream morphology	✓	Sediment managed at small dams
		Occasional large flows
Downstream oxygen	✗	Length of depressed oxygen level minimised
Downstream temperature	✓	Temperature depression minimised
Reservoir margins	✓	Management of levels

Impact	Yes?	Mitigation checklist	In place?
Fish movement at dam	✓	Fish pass	✓
		Downstream flow for fish	✓
		Risk posed by turbines, screens and intakes managed	✓
Reservoir stream access	✗	Fish access to reservoir streams	
Downstream flow regime	✓	Minimum flow (\geq summer low flows)	✓
		Variable additional flows	✓
Downstream morphology	✓	Sediment managed at small dams	✓
		Occasional large flows	✓
Downstream oxygen	✗	Length of depressed oxygen level minimised	
Downstream temperature	✓	Temperature depression minimised	✗
Reservoir margins	✓	Management of levels	✗

Impact	Yes?	Mitigation checklist	In place?	Feasible?
Fish movement at dam	✓	Fish pass	✓	
		Downstream flow for fish	✓	
		Risk posed by turbines, screens and intakes managed	✓	
Reservoir stream access	✗	Fish access to reservoir streams		
Downstream flow regime	✓	Minimum flow (≥ summer low flows)	✓	
		Variable additional flows	✓	
Downstream morphology	✓	Sediment managed at small dams	✓	
		Occasional large flows	✓	
Downstream physico-chemistry	✗	Length of depressed oxygen level minimised		
	✓	Temperature depression minimised	✗	
Reservoir margins	✓	Management of levels	✗	✓

Mitigation	In place?	Feasible?
Fish pass	✓	
Downstream flow for fish	✓	
Risk posed by turbines, screens and intakes managed	✓	
Fish access to reservoir streams		
Minimum flow (≥ summer low flows)	✓	
Variable additional flows	✓	
Sediment managed at small dams	✓	
Occasional large flows	✓	
Length of depressed oxygen level minimised		
<u>Temperature depression minimised</u>	×	×
Management of levels	×	✓

Mitigation	In place?	Feasible?	Wider environment?	Use?
Fish pass	✓			
Downstream flow for fish	✓			
Risk posed by turbines, screens and intakes managed	✓			
Fish access to reservoir streams				
Minimum flow (≥ summer low flows)	✓			
Variable additional flows	✓			
Sediment managed at small dams	✓			
Occasional large flows	✓			
Length of depressed oxygen level minimised				
<u>Temperature depression minimised</u>	✗	✗		
Management of levels	✗	✓	✗	✓

	In place	Practical	Wider env.	Use	2015	2021	2027
Minimum flow (\geq summer low flows)	x	✓	x	x	x	✓	
Variable additional flows	x	✓	x	x	x	✓	

Significant adverse impact

1. Seek to deliver the improvement without any loss of generation
2. Make sure there are significant benefits if there is to be a loss
3. “Significant” does not mean no loss

Not going to be
perfect first time

Update and improve
for future planning
cycles

