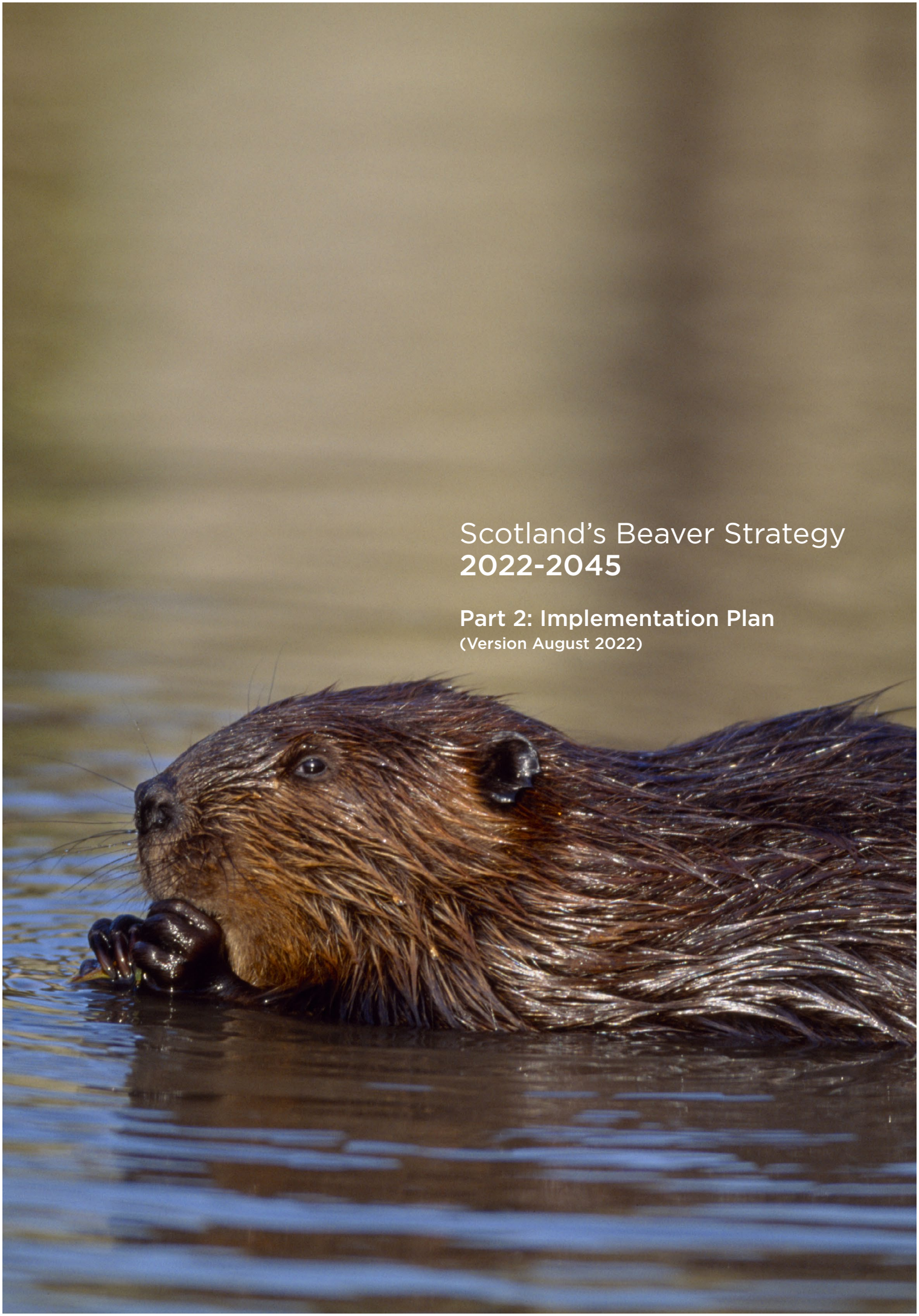

Scotland's Beaver Strategy **2022-2045**

Part 2: Implementation Plan

(Version August 2022)

Beaver bank lodge at Knapdale.

(Photo: Lorne Gill/NatureScot/2020VISION)

Introduction

The following implementation plan outlines the goals, objectives and actions to be undertaken to deliver on *Scotland's Beaver Strategy 2022-2045*. The plan should be considered as a 'working document,' with actions and timelines being updated as new information is received, and existing actions being completed. Refinements to the plan will be overseen and agreed by the Scottish Beaver Advisory Group (SBAG) in consultation with delivery partners. This process will begin with the completion of timelines and identification of implementing organisations for specific actions that still require further clarification and will take place once the Scottish Beaver Advisory Group has been established, to ensure that the initial timeline for delivery is specific, measurable, achievable, relevant and time-bound.

The plan should be viewed in conjunction with *Scotland's Beaver Strategy 2022-2045* and has been organised around the three strategic work themes of the strategy, namely: Conservation Translocation; Management and Mitigation; and Research and Innovation.

The main periods when actions are expected to be carried out are indicated in blue in the timeline columns, headed 2022 through to 2027-2032. In some cases a specific year, or specific years, have been identified in the timeline columns – in these cases this indicates when the timing of the relevant actions need to be reviewed.

Implementation Plan:

Goals, objectives, actions, timelines and assigned responsibilities

Conservation Translocation work theme

Below is the full action table (including timelines and assigned responsibilities) for the Conservation Translocation work theme. Priority actions are highlighted.

Goal 1: Secure availability of support and funding for all aspects of beaver translocation work.

Objective A: Beaver specific funding for translocations and mitigation pre and post translocation.

	2022	2023	2024	2025	2026	2027-2032	How will you know when complete?	Who will lead?	Who will collaborate?	What needs to be in place to enable this action to be completed?
Action i) Maintain commitments by NatureScot to fund and support strategic assessment and specific practical elements associated with conservation translocations (trapping, transport, captive care, health screening), together with associated mitigation.							Ongoing funding scheme (committed to 2032) established and distributing funds at regular intervals for beaver translocation efforts.	NatureScot	Scottish Beaver Advisory Group (SBAG)/ Scottish Government	Ongoing commitment from NatureScot to engage and allocate funding. Grant portal/ application system. Grant administration (via NatureScot).
Action ii) Maintain NatureScot funding for pre-mitigation in planned translocation sites and post-translocation mitigation where needed.							Ongoing funding scheme (committed to 2032) established and distributed rapid response funds in a timely manner to minimise conflict and allow co-existence with beavers for human and biodiversity impacts.	NatureScot	SBAG/ Scottish Government	Commitment from NatureScot to engage and allocate funding.
Action iii) Identify additional funding sources outside of NatureScot and government funding that could also be used to support those proposing beaver translocations and those affected by them.							Will never be complete if funding is required, but record of funding obtained for beaver-related work from outside of NatureScot would help measure to what extent this is happening.	Individuals/ organisations seeking funding	Donors and charities with beaver interests	Existence of appropriate grants and funding streams that can be applied to both translocation and mitigation work.
Action iv) Publish conservation translocation case studies to inform the design of future projects.							Case studies publicly available via download on a hosting site (among NatureScot beaver pages).	NatureScot/ specific organisation(s) undertaking the translocation	Organisations that have already sourced funding for beaver translocations (e.g., RZSS, SWT, Argaty)	Point of contact at NatureScot to co-ordinate. Support from NatureScot to host documents.

Goal 2: Develop a considered and dynamic approach to beaver conservation translocations to new areas to maximise benefits and minimise conflict with humans and existing biodiversity.

Objective A: Identify higher benefit, lower conflict areas for a phased programme of beaver translocations.

	2022	2023	2024	2025	2026	2027-2032	How will you know when complete?	Who will lead?	Who will collaborate?	What needs to be in place to enable this action to be completed?
Action i) Use spatial assessment tools to identify interests and ground-truth this analysis.							Accessible analyses/ maps of all known interests available for use as GIS files - interests to include, known distribution of potentially threatened biodiversity (lichen, invertebrates etc.), PAL, key fishery sites, crofts, railways, roads, suitable beaver habitat and other interests as identified. Ground-truthing - ongoing to an extent as new data become available.	NatureScot/ Translocation applicant	Academic institutes with relevant expertise. British Lichen Society, Buglife, Plantlife, National Biodiversity Network, and other bodies with relevant biodiversity distribution data. NFUS, SLE, Fisheries, and other landowner data hubs. Scottish Water, SEPA, Transport Scotland, Network Rail, Scottish Canals, and other managers of infrastructure	Clear plan for what needs to be mapped and co-ordinator to organise partners and hold to deadlines. Site to publish results and update as new data comes in.
Action ii) Identify and fill knowledge gaps for other species of interest to inform spatial analysis.							*Details to be finalised by SBAG.*			
Action iii) Clear prioritisation of potential translocation sites.							Strategic guidance for potential translocation applicants (could take the form of "traffic light system") provided in a timely manner and clear decision criteria held by NatureScot.	NatureScot	SBAG to sense check	Mapping exercise mentioned above to help create priority designations. Space on NatureScot website to host open prioritisation information.
Action iv) Publish call for expressions of interest from identified priority sites.							Call for EOI issued, and enough responses from suitable (aka high priority) sites to alleviate translocation needs in conflict sites. Should also be dealing with longer term applications from less priority sites that require more work on consultation etc.	NatureScot	All interested parties could help disseminate call for EOIs	NatureScot point person to put out call, and coordinate responses.
Action v) Provide support for those interested in submitting translocation proposals in line with strategic guidance in seeking funding and expertise where required.							Accessible resources available for translocation applicants.	NatureScot	Previous recipients of beaver translocation licences	NatureScot point person to respond to requests for support and coordinate response from potential helpers.

Goal 2, Objective B: Conduct well-planned, responsible translocations to new sites in Scotland.

	2022	2023	2024	2025	2026	2027-2032	How will you know when complete?	Who will lead?	Who will collaborate?	What needs to be in place to enable this action to be completed?
Action i) Engage with landowners to source beavers for translocation.							Ongoing if needed to remove beavers from conflict sites via translocation.	NatureScot	BeaverTrust	Point of contact at NatureScot to engage with landowners on translocation needs in a timely fashion.
Action ii) Undertake thorough, proportionate stakeholder engagement at potential release sites in line with strategic guidance on translocations.							Ongoing as translocations will always require a process of engagement with those likely to be affected.	Translocation applicant	Guidance from Nature Scot. Oversight from SBAG and National Species Reintroduction Forum (NSRF)	Clear guidance on stakeholder engagement (see Goal 3). NatureScot point person who can advise applicants and consult with SBAG and NSRF.
Action iii) Conduct trapping at relevant landowner properties.							Ongoing if need to remove beavers from conflict sites via translocation.	NatureScot	BeaverTrust/ landowners requesting trapping	Increased resources in terms of trapping equipment and trained, licensed trappers.

Goal 2, Objective C: Ensure good practice in translocation population management to safeguard beaver welfare and maximise probability of successful establishment.

	2022	2023	2024	2025	2026	2027-2032	How will you know when complete?	Who will lead?	Who will collaborate?	What needs to be in place to enable this action to be completed?
Action i) Create and integrate Standard Operating Procedures to safeguard welfare into all translocation applications, with reference to the review of wild beaver welfare in Scotland being conducted by SAWC (the Scottish Animal Welfare Commission).							SOP on beaver welfare during translocations produced.	NatureScot or ScotGov	Advice from Scottish Animal Welfare Commission (SAWC) and BeaverTrust. The review of wild beaver welfare in Scotland conducted by SAWC should be taken into consideration when creating the SOP	Time commitment from SAWC and a completed review of wild beaver welfare. Space on NatureScot website to host SOP.
Action ii) Apply disease screening based on existing DRA (Disease Risk Analysis) in translocation projects.							Arrangements in place for beaver disease screening with qualified vets. Disease screening provision included in all translocation applications.	NatureScot	SAWC and potentially other vet partners such as RZSS, SRUC, Royal Dick etc. Authors of **DRA for beavers**	Veterinary partners with resource, knowledge, and willingness to take part in beaver translocation disease screening, DRA protocol publicly available.

Action iii) Integrate blood/tissue sampling into all translocations for genetic analyses and management with samples banked in a shared national public resource.		Ongoing - required for all translocations.	To be confirmed – Options include RZSS via the **BioBank initiative**	RZSS, NMS, relevant academics, Beaver Trust, NatureScot	Identification of central storage point for genetic samples and protocol for sample collection for use by licensed trappers and vets.
Action iv) Integrate genetic data into planning for ongoing population management and future translocations, including from other European populations when required.		Ongoing - required for all translocations and into longer term - complete when clear strategy re: bringing in additional beavers from Europe is published.	SBAG (dissemination)/ NatureScot (Integration into population modelling and strategy)	Anyone conducting genetic research on beavers in Britain and beyond	Genetic monitoring that allows evaluation of need to bring in additional beavers. Modelling capacity within NatureScot/ collaborators. Licences and frameworks in place to import beavers from overseas. Quarantine holding facilities for beavers coming into the country from overseas.
Action v) Ensure post-release monitoring included in translocation planning (immediately after release and follow-up, including data specifically to allow an audit of the impact of mitigation procedures on beaver health and welfare), in line with existing licensing procedures.		Ongoing - required for all translocations.	NatureScot	Applicants for translocation licences. Those with experience in beaver monitoring techniques (e.g., RZSS, SWT, Beaver Trust and international experience)	Resources and expertise available to facilitate/conduct monitoring.
Action vi) Incorporate clear exit strategy into all translocation plans in case something goes wrong (for beavers, other organisms, or humans).		Ongoing - required for all translocations.	NatureScot/ Translocation applicant	NSRF and SAWC	Resources for exit strategy (e.g., trapping or culling) available.

Goal 3: Ensure a transparent, inclusive, timely and straightforward translocation licence application process to build trust and engagement.

Objective A: Ensure support for pre-application and licensing.

	2022	2023	2024	2025	2026	2027-2032	How will you know when complete?	Who will lead?	Who will collaborate?	What needs to be in place to enable this action to be completed?
Action i) Provide guidance to guide applications from appropriate and prioritised locations.							Maps and guidance published. Support and communication ongoing needs.	NatureScot	Newcastle University team and other academic institutes with relevant expertise. British Lichen Society, Buglife, National Biodiversity Network, and other bodies with relevant biodiversity distribution data. NFUS, SLE, Fisheries, and other landowner data hubs. Scottish Water, SEPA, Transport Scotland, Network Rail, Scottish Canals, and other managers of infrastructure	Interest mapping and ground-truthing (see Goal 2).
Action ii) Produce clear, transparent guidance on what engagement is proportionate to a given translocation proposal for beavers.							Guidance published and openly available.	NatureScot	SBAG	Staff resource at NatureScot to produce guidance. Space on NatureScot' website to host guidance.
Action iii) Implement strategic assessment for proposed translocations into new catchments, in line with the Scottish Code for Conservation Translocations.							Would only be complete if beavers present in every catchment in Scotland - otherwise will always be a need for this in new catchments.	Individuals/ organisations seeking funding	Donors and charities with beaver interests	Existence of appropriate grants and funding streams that can be applied to both translocation and mitigation work.

Goal 3, Objective B: Ensure transparency on decision-making re: translocation licences.

	2022	2023	2024	2025	2026	2027-2032	How will you know when complete?	Who will lead?	Who will collaborate?	What needs to be in place to enable this action to be completed?
Action i) Produce publicly available decision documents for beaver translocation licences as standard practice.							Decision document template produced and published. Decision document available for every translocation licence application considered.	NatureScot	SBAG	Staff resource at NatureScot' to produce document.

Management and Mitigation work theme

Below is the full action table (including timelines and assigned responsibilities) for the Management and Mitigation work theme.

Goal 4: Implement the sequential hierarchy of: accommodation > mitigation > translocation > lethal control, to support living with beavers and reduce negative impacts long-term.

Objective A: Review and update guidance within the management framework and other related regulatory guidance.

	2022	2023	2024	2025	2026	2027-2032	How will you know when complete?	Who will lead?	Who will collaborate?	What needs to be in place to enable this action to be completed?
Action i) Update guidance supporting the Beaver Management Framework to reflect the mitigation hierarchy with due consideration given to the natural capital implications of management decisions being made.						2030	Publish, review after 2 years and then 5. Needs to be adaptive with review on periodic basis.	NatureScot	SBAG, BLS	NatureScot resource.
Action ii) Undertake, publish and consult on a Strategic Environmental Assessment (SEA) that will include the identification of risks and constraints of beaver translocation and natural colonisation to other interests (habitats, species, migratory fish, land management, infrastructure).							Publish.	NatureScot/ collaborating with public agencies	SBAG	Possible contract.
Action iii) Develop criteria and map locations in Scotland that will provide broad assessments of potential benefits and constraints.							Publish.	NatureScot	SBAG	
Action iv) Monitor best practice from other beaver range states to inform local/national options and ensure evidence-based practice.						2030	Periodic review considered by SBAG.	SBAG	SBAG	Commissioned review?
Action v) Ensure national risk-based guidance on the regulatory control of engineering-based management options under the Controlled Activity Regulations is updated and then periodically reviewed to take account of innovative and novel engineering approaches to managing beaver impact, adapting to results from ongoing monitoring.							Publish.	SEPA	NatureScot / SBAG	
Action vi) Publish summary review and data on management and mitigation, including emerging issues and challenges, research and development and technological advances.							Publish.	NatureScot / SBAG		

Goal 4, Objective B: Identify and resolve barriers to implementation of mitigation.

	2022	2023	2024	2025	2026	2027-2032	How will you know when complete?	Who will lead?	Who will collaborate?	What needs to be in place to enable this action to be completed?
Action i) Develop knowledge exchange programme on existing and new techniques, and good practice.						2031-2032	Demonstration sites established.	SBAG	FLS, HES, LAs, MSS, NatureScot, Network Rail, SRUC, Transport Scotland, BLS	
Action ii) Utilise the evaluation of current and future mitigation techniques in landscape population modelling.						2032	Published outputs/models.	Research Institutions/ NatureScot	Possible SBAG sub-group	

Goal 4, Objective C: Raise visibility of and access to existing guidance on management/mitigation measures for all stakeholders.

	2022	2023	2024	2025	2026	2027-2032	How will you know when complete?	Who will lead?	Who will collaborate?	What needs to be in place to enable this action to be completed?
Action i) Ensure information on management and mitigation is updated and more easily and readily accessible - including clarity for emergency actions for public safety and infrastructure.						2030		NatureScot	SBAG	Infrastructure in place.

Goal 4, Objective D: Establish funding mechanism for enacting the management framework to ensure sufficient funding in place to meet needs.

	2022	2023	2024	2025	2026	2027-2032	How will you know when complete?	Who will lead?	Who will collaborate?	What needs to be in place to enable this action to be completed?
Action i) Scottish Government and NatureScot to work with stakeholders to understand the cost of mitigation and management efforts to ensure that funding needs are met.						Every 2 yrs.				
Action ii) Scottish Government and NatureScot agree and set out the support to be provided for mitigation and management.						Every 2 yrs.	Publish	SG / NatureScot	SBAG	Can set out 22/23 but will require detail from spending review outcomes and NatureScot business planning (difficult to have longer term detail) other than intent.

Goal 5: Establish systems to support land managers in the development of naturalised riparian networks that can accommodate beavers.

Objective A: Goal-related best practice guidance and training support in place built on prior experience.

	2022	2023	2024	2025	2026	2027-2032	How will you know when complete?	Who will lead?	Who will collaborate?	What needs to be in place to enable this action to be completed?
Action i) Review existing systems in place in beaver range states to encourage land managers to apply established beaver mitigation and land management practices that either mitigate problems and/or encourage beaver-appropriate habitats.							Review published.	SBAG	Range of collaborators	
Action ii) Identify management and mitigation knowledge gaps.							Ongoing process.	NatureScot / SBAG		
Action iii) Identify and collaborate with existing training providers and delivery mechanism (e.g. Chartered Institute of Ecology and Environmental Management courses) to create training opportunities for target audiences.							Training programmes in place.	NatureScot	Scottish Canals/ Forestry and Land Scotland/ Forest Industry Environment Group (part of Confederation of Forest Industries)/ Others as appropriate	
Action iv) Publish Scottish-relevant protocols covering agreed best practices which incorporate assessed, practical guidance, with consideration of impacts on other species, habitats, land-use and animal welfare principles.							Updated protocols/ best practice guidelines published as required.	NatureScot / SBAG		

Goal 5, Objective B: System in place for encouraging cooperation between neighbouring land managers and other stakeholders recognising the scale at which beavers operate.

	2022	2023	2024	2025	2026	2027-2032	How will you know when complete?	Who will lead?	Who will collaborate?	What needs to be in place to enable this action to be completed?
Action i) Deliver incentives and guidance to support landscape scale, collaborative approaches which plan for and deliver maximum benefits and minimal risk from beaver activity.								NatureScot/ SG/ Public agencies	SBAG	
Action ii) Review systems in place to encourage land managers to apply collaborative land management practices at a landscape scale that encourage beaver-appropriate habitats and put in place systems if they are lacking.						2030		SBAG	SBAG	
Action iii) Identify related policies and programmes in place nationally which could contribute resources to encourage development of beaver-suitable habitats.						2029-2030		NatureScot	SBAG	

Goal 5, Objective C: Support land managers and other stakeholders experiencing negative impacts from beaver activity.

	2022	2023	2024	2025	2026	2027-2032	How will you know when complete?	Who will lead?	Who will collaborate?	What needs to be in place to enable this action to be completed?
Action i) Ensure clarity on the mitigation and monitoring measures receiving funding and advisory support and those actions expected to be delivered by land managers and other affected stakeholders.						2032	Publish.	NatureScot/ SG		Published guidance on mitigation scheme.
Action ii) Beaver mitigation scheme resourced and delivered to meet demand.						every year	Report.	NatureScot/ SG	SBAG	
Action iii) Scope and develop opportunities for integrated (biodiversity and climate) incentive-based schemes to support living with beavers and the opportunity costs of this.						2030		NatureScot / SG	ARED, SF, SBAG	

Goal 5, Objective D: Explore the increase in buffer zones around water courses to reduce likelihood of beaver impacts on other land uses.

	2022	2023	2024	2025	2026	2027-2032	How will you know when complete?	Who will lead?	Who will collaborate?	What needs to be in place to enable this action to be completed?
Action i) Assess, using existing Scottish Environment Protection Agency (and other) data, the status of riparian buffer zones in Scotland (e.g. extent, condition, connectivity).								NatureScot	SEPA/ Scottish Agriculture Department/ Rural Payments Inspection Division (RPID)/ Agriculture and Rural Economy Directorate/ Others	
Action ii) Review and collate all existing regulatory and rural payment mechanisms that affect riparian buffer zones (e.g. SEPA General Binding Rules, Good Agricultural and Environmental Conditions' (GAEC), Agri-Environment Climate Scheme (AECS), etc), for both cultivation and grazing land.								NatureScot	SEPA/ Scottish Agriculture Department/ Rural Payments Inspection Division (RPID)/ Agriculture and Rural Economy Directorate/ Others	
Action iii) As part of the review, regarding the water margins funded through agri-environment support, establish how suitable buffer design, eligibility, application and management requirements relate to beavers.								NatureScot	SEPA/ Scottish Agriculture Department/ Rural Payments Inspection Division (RPID)/ Agriculture and Rural Economy Directorate/ Others	
Action iv) Establish - with all stakeholder interests - the costs and benefits of increasing the width, design or management of buffer zones around watercourses to determine barriers to implementation and how could these be taken account of in scheme design.								NatureScot	SEPA/ Scottish Agriculture Department/ Rural Payments Inspection Division (RPID)/ Agriculture and Rural Economy Directorate/ Others	
Action v) Explore with the Scottish Government and NatureScot the potential to build a more comprehensive and coordinated approach to managing riparian buffer zones into the next rural payments scheme.								NatureScot	SEPA/ Scottish Agriculture Department/ Rural Payments Inspection Division (RPID)/ Agriculture and Rural Economy Directorate/ Others	

Goal 6: Raise awareness within the Scottish public of beavers and the associated benefits and issues in order to improve the acceptance of management decisions.

Objective A: Develop and implement a public communications strategy.

	2022	2023	2024	2025	2026	2027-2032	How will you know when complete?	Who will lead?	Who will collaborate?	What needs to be in place to enable this action to be completed?
Action i) Produce a public communications strategy.							Comms strategy produced.	SBAG sub-group?	SBAG	Resourcing.
Action ii) Implement the communications strategy.							Comms support in place.	SBAG sub-group?	SBAG	Resourcing.

Goal 6, Objective B: Develop additional learning resources for interested groups.

	2022	2023	2024	2025	2026	2027-2032	How will you know when complete?	Who will lead?	Who will collaborate?	What needs to be in place to enable this action to be completed?
Action i) Work with Education Scotland and local authorities to produce teaching resources for schools.							Contract issued and delivered.	SBAG sub-group?	SBAG membership	Resourcing.
Action ii) Ensure a Scotland's Beaver Strategy website is produced and maintained including accessible summaries of research findings, licence returns (including applications for dam removal, translocation and lethal control) etc.							Website exists.	SBAG sub-group?	Contracted out for production	Resourcing.

Research and Innovation work theme

Below is the full action table (including timelines and assigned responsibilities) for the Research and Innovation work theme.

Goal 7: Improve understanding of beaver biology and status within the Scottish context.

Objective A: To assess the conservation and population status of Eurasian beaver in Scotland.

	2022	2023	2024	2025	2026	2027-2032	How will you know when complete?	Who will lead?	Who will collaborate?	What needs to be in place to enable this action to be completed?
Action i) Research and further develop survey and monitoring methodology.							Methodology ready to inform population monitoring (next action).	NatureScot	R&I (Research & Innovation) sub-group	Ongoing.
Action ii) Undertake population research and monitoring at appropriate time periods.						2029	Published output.	NatureScot	Research Institutions, Conservation NGOs, SBAG	4 yearly surveys.
Action iii) Create and maintain a shared national public resource for long-term archiving of samples and specimens to better understand beaver biology and genetics in Scotland and inform population development and management.							Database and archive established.	NMS	R&I sub-group	Effective scheme for collecting samples. Sample/ specimen storage and sharing protocol.
Action iv) Plan for long-term population and genetic monitoring and assign responsibility for genetic analysis, including ongoing surveillance for North American beaver presence.						2029	Published output.	RZSS (genetics)/ NMS	R&I sub-group	Effective scheme for collecting samples. Sample/ specimen storage and sharing protocol.

Goal 7, Objective B: Collate appropriate biological information to inform development of tools, models and the application of management and mitigation.

	2022	2023	2024	2025	2026	2027-2032	How will you know when complete?	Who will lead?	Who will collaborate?	What needs to be in place to enable this action to be completed?
Action i) Develop a system for data retention and sharing.							Established system.	SBAG (through R&I sub-group?)	NatureScot, RZSS, NMS, Research Institutions	Agreement of data sharing protocols, access and usage
Action ii) Improve understanding of habitat use and availability at different scales.						2029	Published outputs, Improved/ updated models.	Research Institutions/ NatureScot	SBAG (through R&I sub-group?)	Linked to surveys/ monitoring in Obj. A, Action i).
Action iii) Develop and refine tools to inform management and scenario planning.						2029	Published outputs, Improved/ updated models.	Research Institutions/ NatureScot	SBAG (through R&I sub-group?)	Linked to surveys/ monitoring in Obj. A, Action i).
Action iv) Research and monitor physical health (including zoonoses) of the population and interactions with other species and public health.							Ongoing action.	SRUC/ NMS/ RZSS	Scottish Water, EPIC, NatureScot, SSPCA, Research Institutions, R&I sub-group	Linked to sampling in Obj. A, Action i).

Goal 8: Assess the biological, environmental, economic and social implications of beaver presence on other species, habitats, physical processes, land use, wider society and wider ecosystem services (including general 'natural capital') and use this knowledge to inform decision-making.

Objective A: Assess interactions between beavers and species and habitats of conservation interest to inform adaptive management.

	2022	2023	2024	2025	2026	2027-2032	How will you know when complete?	Who will lead?	Who will collaborate?	What needs to be in place to enable this action to be completed?
Action i) Develop technologies to assess interactions with priority terrestrial and aquatic species and communities (e.g. salmon, aspen, some lichens, invertebrates).						2028	New methods developed.	NatureScot/ Marine Scotland Science + key stakeholders	Fisheries Management Scotland and relevant interest groups (e.g. BLS, BBS, Buglife etc.), R&I sub-group	Identification and prioritisation of specific issues to target for resourcing.
Action ii) Implement monitoring to take account of the effects of beaver presence at designated sites.							Published output.	NatureScot	NE, NRW	Works around the existing site condition monitoring cycle.
Action iii) Develop a protocol for proportionate and appropriate baseline monitoring prior to translocations.						2028	Established protocol.	NatureScot	R&I sub-group	Identification and prioritisation of key monitoring needs.
Action iv) Review the extent of existing hydro-morphological monitoring and compare to the assessment of areas likely to be colonised by beavers.							*Details to be finalised by SBAG*			

Goal 8, Objective B: To understand modifications in physical and biogeochemical processes (carbon sequestration, sediment storage, decomposition rates) resulting from beaver activity.

	2022	2023	2024	2025	2026	2027-2032	How will you know when complete?	Who will lead?	Who will collaborate?	What needs to be in place to enable this action to be completed?
Action i) Establish monitoring systems for wetland creation and measurement of stream flows (low flows, average flows, high flows, dam failure, upstream flooding).						2027, 2032	Published outputs.	CREW/ Research Institutions		Established methodologies and protocols, field sites.
Action ii) Develop and implement an appropriate monitoring strategy that captures the role of beaver presence in relation to climate change.						2027, 2032		CREW/ Research Institutions	NatureScot, SEPA, R&I sub-group	Established methodologies and protocols, field sites.
Action iii) Develop an approach to assessing the continuity of riparian vegetation as a measure of the connectivity of a naturalised riparian network, then apply to establish a baseline measure of network integrity.								Publish report	SEPA	NatureScot.
Action iv) Explore how the existing SEPA hydro-morphological monitoring system (MIMAS) could be combined with fluvial audit survey to capture both morphological alterations and the changes to processes resulting from arrival or introduction of beavers.								Publish approach/ method	SEPA	NatureScot.

Goal 8, Objective C: Identify areas where beaver presence results in changes to physical processes that can confer benefits/risks to ecosystem services.

	2022	2023	2024	2025	2026	2027-2032	How will you know when complete?	Who will lead?	Who will collaborate?	What needs to be in place to enable this action to be completed?
Action i) Further develop beaver dam models to understand the changes in physical processes.						2027, 2032	Published outputs/models.	CREW/ Research Institutions	NatureScot, SEPA, R&I sub-group	Existing beaver dam model to be applied at Scottish/ catchment level, establish methodologies for further refinement.
Action ii) Use beaver dam models to predict the benefits/risks to the physical processes.							Published outputs/models.	CREW/ Research Institutions	NatureScot, SEPA, R&I sub-group	Existing and future iterations of beaver dam model to be applied at Scottish/ catchment level.

Goal 8, Objective D: Undertake economic monitoring and research to help inform the design of wider beaver restoration.

	2022	2023	2024	2025	2026	2027-2032	How will you know when complete?	Who will lead?	Who will collaborate?	What needs to be in place to enable this action to be completed?
Action i) Undertake an economic cost-benefit assessment of beaver presence in Scotland to date, and of potential future scenarios.							Published outputs.	Research Institutions	NatureScot, R&I sub-group	Established methodologies and protocols.
Action ii) Develop a framework for assessing cost-benefits of beaver presence in localised areas (considering expected variation between different stakeholder groups).							Published outputs.	Research Institutions	NatureScot, R&I sub-group	Established methodologies and protocols.

Goal 8, Objective E: Undertake social monitoring and research to help inform action to support management of current and future beaver zones.

	2022	2023	2024	2025	2026	2027-2032	How will you know when complete?	Who will lead?	Who will collaborate?	What needs to be in place to enable this action to be completed?
Action i) Undertake research on the current perceptions/impacts of having beavers, across different stakeholders and at differing scales.							Published outputs.	UHI/ NatureScot	SBAG/ Research Institutions	SBAG collaboration.
Action ii) Undertake research to assess the effect of beaver restoration on mental wellbeing including different stakeholders.							Published outputs.	Research Institutions	Health and wellbeing specialists	SBAG collaboration.
Action iii) Use the research generated from Actions i) and ii) to inform the design of wider beaver restoration in appropriate areas.							Ongoing.	SBAG	R&I sub-group	Above actions.

Goal 9: Assess effectiveness of existing mitigation and install, test and develop new ideas and techniques.

Objective A: Review on the ground mitigation measures to ensure they are effective.

	2022	2023	2024	2025	2026	2027-2032	How will you know when complete?	Who will lead?	Who will collaborate?	What needs to be in place to enable this action to be completed?
Action i) Review mitigation measures to ensure they are effective in supporting fisheries management.						2027, 2032	Published outputs.	CREW/ Research Institutions	SBAG	Consultation with SBAG stakeholders.
Action ii) Review mitigation measures to ensure they are effective in supporting forestry management.						2027, 2032	Published outputs.	CREW/ Research Institutions	SBAG	Consultation with SBAG stakeholders.
Action iii) Review mitigation measures to ensure they are effective in supporting agricultural land management.						2027, 2032	Published outputs.	CREW/ Research Institutions	SBAG	Consultation with SBAG stakeholders.
Action iv) Review mitigation measures to ensure they are effective in supporting other land and water uses (e.g. ornamental gardens, historic sites, biodiversity sites).						2027, 2032	Published outputs.	CREW/ Research Institutions	SBAG	Consultation with SBAG stakeholders.
Action v) Review mitigation measures to support protection of infrastructure and its function.						2027, 2032	Published outputs.	CREW/ Research Institutions	SBAG	Consultation with SBAG stakeholders.

Goal 9, Objective B: To test and refine methods/ technologies taking account of progress in Europe and North America.

	2022	2023	2024	2025	2026	2027-2032	How will you know when complete?	Who will lead?	Who will collaborate?	What needs to be in place to enable this action to be completed?
Action i) Test and refine methods/ technologies taking account of progress in Europe and North America to support fisheries management.							Published outputs.	MSS	SBAG	The outputs of Obj. A, Action i).
Action ii) Test and refine methods/ technologies taking account of progress in Europe and North America to support forestry.							Published outputs.	FLS	SBAG	The outputs of Obj. A, Action ii).
Action iii) Test and refine methods/ technologies taking account of progress in Europe and North America to support agricultural land management.							Published outputs.	SRUC/ NatureScot	The review outputs of Obj. 4.1	The outputs of Obj. A, Action iii).
Action iv) Test and refine methods/ technologies taking account of progress in Europe and North America to support other land and water uses (e.g. ornamental, historic sites, biodiversity sites).							Published outputs.	HES/ NatureScot	SBAG	The outputs of Obj. A, Action iv).
Action v) Test and refine methods/ technologies taking account of progress in Europe and North America to support protection of infrastructure.							Published outputs.	Network Rail/ Transport Scotland/ LAs/ NatureScot	SBAG	The outputs of Obj. A, Action v).
Action vi) Identify and resolve barriers to implementation of mitigation.						*Details to be finalised by SBAG*				
Action vii) Establish a database to record and monitor working experiences with an online, open access platform for information dissemination and knowledge exchange on existing and new techniques and good practice.						2031, 2023	Demonstration sites established.	SBAG	FLS, HES, LAs, MSS, NatureScot, Network Rail, SRUC, Transport Scotland	The outputs of Obj. A, and of the above Obj. B actions.
Action viii) Utilise the evaluation of current and future mitigation techniques in landscape population modelling.						2027, 2032	Published outputs/models.	Research Institutions/ NatureScot	R&I sub-group	The outputs of Obj. A.

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Part 2: Implementation Plan

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