

NATIONAL CARP CONTROL PLAN

NCCP implementation



This suite of documents contains those listed below.

NCCP TECHNICAL PAPERS

1. Carp biocontrol background
2. Epidemiology and release strategies
3. Carp biocontrol and water quality
4. Carp virus species specificity
5. Potential socio-economic impacts of carp biocontrol
6. NCCP implementation
7. NCCP engagement report
8. NCCP Murray and Murrumbidgee case study
9. NCCP Lachlan case study

NCCP RESEARCH (peer reviewed)

Will carp virus biocontrol be effective?

1. 2016-153: Preparing for Cyprinid herpesvirus 3: A carp biomass estimate for eastern Australia
2. 2018-120: Population dynamics and carp biomass estimates for Australia
3. 2017-148: Exploring genetic biocontrol options that could work synergistically with the carp virus
4. 2016-170: Development of hydrological, ecological and epidemiological modelling
5. 2017-135: Essential studies on Cyprinid herpesvirus 3 (CyHV-3) prior to release of the virus in Australian waters
6. 2020-104: Evaluating the role of direct fish-to-fish contact on horizontal transmission of koi herpesvirus
7. 2019-163 Understanding the genetics and genomics of carp strains and susceptibility to CyHV-3
8. 2017-094: Review of carp control via commercial exploitation

What are the carp virus biocontrol risks and how can they be managed?

9. 2017-055 and 2017-056: Water-quality risk assessment of carp biocontrol for Australian waterways
10. 2016-183: Cyprinid herpesvirus 3 and its relevance to humans
11. 2017-127: Defining best practice for viral susceptibility testing of non-target species to Cyprinid herpesvirus 3
12. 2019-176: Determination of the susceptibility of Silver Perch, Murray Cod and Rainbow Trout to infection with CyHV-3
13. 2016-152 and 2018-189: The socio-economic impact assessment and stakeholder engagement
Appendix 1: Getting the National Carp Control Plan right: Ensuring the plan addresses community and stakeholder needs, interests and concerns
Appendix 2: Findings of community attitude surveys
Appendix 3: Socio-economic impact assessment – commercial carp fishers
Appendix 4: Socio-economic impact assessment – tourism sector
Appendix 5: Stakeholder interviews
Appendix 6: Socio-economic impact assessment – native fish breeders and growers
Appendix 7: Socio-economic impact assessment – recreational fishing sector
Appendix 8: Socio-economic impact assessment – koi hobbyists and businesses
Appendix 9: Engaging with the NCCP: Summary of a stakeholder workshop
14. 2017-237: Risks, costs and water industry response
15. 2017-054: Social, economic and ecological risk assessment for use of Cyprinid herpesvirus 3 (CyHV-3) for carp biocontrol in Australia
Volume 1: Review of the literature, outbreak scenarios, exposure pathways and case studies
Volume 2: Assessment of risks to Matters of National Environmental Significance
Volume 3: Assessment of social risks
16. 2016-158: Development of strategies to optimise release and clean-up strategies
17. 2016-180: Assessment of options for utilisation of virus-infected carp
18. 2017-104: The likely medium- to long-term ecological outcomes of major carp population reductions
19. 2016-132: Expected benefits and costs associated with carp control in the Murray-Darling Basin

NCCP PLANNING INVESTIGATIONS

1. 2018-112: Carp questionnaire survey and community mapping tool
2. 2018-190: Biosecurity strategy for the koi (*Cyprinus carpio*) industry
3. 2017-222: Engineering options for the NCCP
4. NCCP Lachlan case study (in house) (refer to Technical Paper 9)
5. 2018-209: Various NCCP operations case studies for the Murray and Murrumbidgee river systems (refer to Technical Paper 8)

NCCP Technical Paper 6: NCCP implementation

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2. About this paper

A virus called Cyprinid herpesvirus 3 (CyHV-3, hereafter ‘the carp virus’, or ‘the virus’) has been proposed as a biological control agent for European Carp or common carp (*Cyprinus carpio*, hereafter ‘carp’), an invasive pest fish widespread in south-eastern Australia. The Australian Government has provided \$10.211 million since 2017 for development of a National Carp Control Plan (NCCP) assessing the viability of carp biocontrol using CyHV-3.

This paper describes and discusses implementation of carp-virus biocontrol including management, systems, strategies and tactics and policies and procedures. NCCP modelling indicates that, if successfully deployed, CyHV-3 could reduce and suppress highly resilient carp populations by approximately 40–60% and less resilient populations by approximately 60–80%. These modelled outcomes depend on some model assumptions and the uniform susceptibility of Australian carp to the disease caused by the virus.

While sustained, broadscale carp reductions of any magnitude could potentially bring benefits, NCCP research indicates that reduction of carp impacts may benefit from an integrated approach in which virus deployment is preceded by targeted harvesting (NCCP research project 4). However, this technical paper focuses only on biological control, reflecting the NCCP’s primary focus. If governments decide to proceed towards development of an integrated control approach incorporating both biological control and targeted harvesting, the design, costing, and implementation of the latter will require separate consideration.

3. Introduction

This report outlines management, policies, strategies and tactics to implement the NCCP. The report provides technical detail on the implementation planning and operations phases or periods of the NCCP.

If Australian governments decide to undertake additional research, planning, and other activities (as suggested in the NCCP) to inform a decision on whether or not carp biocontrol should proceed, and, after considering results from these activities, do decide to initiate such a program, implementation could begin when:

- Legislative and regulatory arrangements and requirements for the use of the carp virus to control carp have been finalised at national, and state and territory levels.
- Support, governance and approvals are in place at national, and state and territory levels.
- Predicted climate conditions support initiation of carp biocontrol implementation when there is average or above-average flow during a dryer climatic period when carp populations are both reduced and concentrated at known aggregation locations.

Key elements of implementation would be:

- organisational and governance structures and systems that are largely based on existing structures and systems,
- implementation planning at national and state and territory coordination levels to inform strategy, direction and policy,
- implementation planning at regional control level to inform field operations,
- implementation operations at regional control level, and
- closure.

With pre-requisites such as regulatory and legislative arrangements for the implementation of the NCCP in place, the first year of strategic planning and supporting activities for implementation will validate and confirm the arrangements, structures, authorities and systems to be used during operational activities undertaken at the regional control level.

Both the state and territory coordination and regional control levels will develop implementation plans for their respective levels. Each state and territory will coordinate regional control centres in their state or territory to undertake field operations at regional level.

National coordination will oversee the planning and implementation of the NCCP at state and territory level to deliver consistency and predictability between the jurisdictions.

4. Implementation structures and systems

4.1 *Organisational structures*

The establishment of organisational structures at the national, state and territory and regional levels is critical to the implementation of the NCCP. The structures will deliver key outcomes including:

- provision of strategic policy and direction at the jurisdictional coordination level including cross-border operations between each state and territory, and
- planning and implementation of operational activities at regional control level.

The organisational structures at each level will accommodate a multi-agency approach.

The Australian Interagency Incident Management system (AIIMS)¹ Incident Control System (ICS) provides guidance on contemporary practices for the management of incidents in Australia. ICS has been developed nationally to ensure that incident management is through a systems-based approach that is clearly understood and agreed to before an incident. ICS applies to the management of any incident for any type of hazard or disaster impact. ICS is well understood and long practiced by each jurisdiction at the national, state and territory and regional levels.

ICS ensures where and when there is an incident regardless of the hazard or disaster, the necessary arrangements to manage that incident are structured, systematic and uniform. The approach supports expansion and contraction of management that reflects the scale and complexity of the incident.

The attributes of ICS that make it suited to use for implementation of the NCCP are:

- ICS is familiar to all governments based on their experience with an all-hazards management of incidents.
- Effective application for management of a range of incident scales and complexities.
- ICS articulates roles and responsibilities for coordination and control levels.
- Efficient and timely implementation of measures to manage the deployment of the carp virus and manage the associated risks.
- Supports management of funding and management of risks through evidence-based decision making including that based on science.

¹The Australasian Inter-Service Incident Management System (AIIMS) is the nationally recognised system of incident management for the nation's fire and emergency service agencies. Organisational principles and structure are used to manage bushfires and other large emergencies (e.g. floods, storms, cyclones etc.) utilising the all-agencies approach.

The organisational structure will have roles and responsibilities that are clearly defined. Decisions and actions will be undertaken at the appropriate level. The organisational structure spans coordination at the national, and state and territory levels, and control at the regional level.

The systematic and structured approach of ICS will facilitate the use of enabling processes and mechanisms that will underpin the detailed and timely planning and implementation required for effective carp biocontrol. The use of ICS for implementation acknowledges the presence of the Biosecurity Incident Management System (BIMS) for biosecurity incidents. ICS and BIMS are fundamentally the same. BIMS is an adaptation of ICS for use during a biosecurity incident. ICS is more widely practiced and understood across government agencies.

4.2 Functional management

A fundamental principle of ICS is functional management. The six functions of ICS are depicted in Figure 1. The diagram outlines the following (ICS) functions:

Implementation management

- management of all the functions and activities at the relevant level,
- at state or territory coordination level, overall management of state or territory coordination centres and coordination of activities within the jurisdiction, and coordination of the Regional Control Centres (RCCs) in their jurisdiction, and at control level, overall management of the RCC and field operations and supporting activities for a designated regional area.

Planning function

- The planning function includes the collection, collation, analysis, interpretation and dissemination of information.
- Strategic planning at the coordination level includes strategic policy and direction, resource coordination, technical information management, strategic risk management, jurisdictional reports including situation reports, and legal advice.
- Operational planning at the regional control level including identification and management of operational risks, situation reports and resourcing.

Operations function

- The operations function includes tasking and application of resources to achieve the aim and objectives.
- Operations has a strong and visible presence at the regional control level.
- Operations at the state or territory coordination level includes activities to support (not undertake) cross border operations.

Logistics function

- The logistics function obtains, maintains and sustains the provision of human and physical resources, including facilities, equipment, services and stores at the relevant level.
- Logistics has a strong presence at the regional control level to ensure operations are adequately resourced to deliver the aim and objectives.
- Logistics at the jurisdictional coordination level ensures coordination between RCCs and where necessary between jurisdictions.

Finance and administration function

- This function includes management of records and information, administration of finance, and administrative arrangements for procurement and engagement of human and physical resources.
- This function has a strong presence at the jurisdictional coordination level.

Public information function (communications, media and community engagement)

- At the national and state and territory coordination levels the management of public information includes interfacing with national and state and territory media.
- At the regional control level there is a strong emphasis on community engagement with local stakeholders.

Safety

- Whilst not an actual function of ICS, in the contemporary ICS structure safety has the profile of a function with safety-reporting to the Coordinator or Controller depending on the level.
- For a small incident there may be a single safety role. For a medium- to large-scale incident there will be multiple roles allocated to safety, including safety officers within Operations and a safety manager with overall responsibility for the safety and health management system. A safety role is present in the management team for the state and territory coordination and regional control levels.

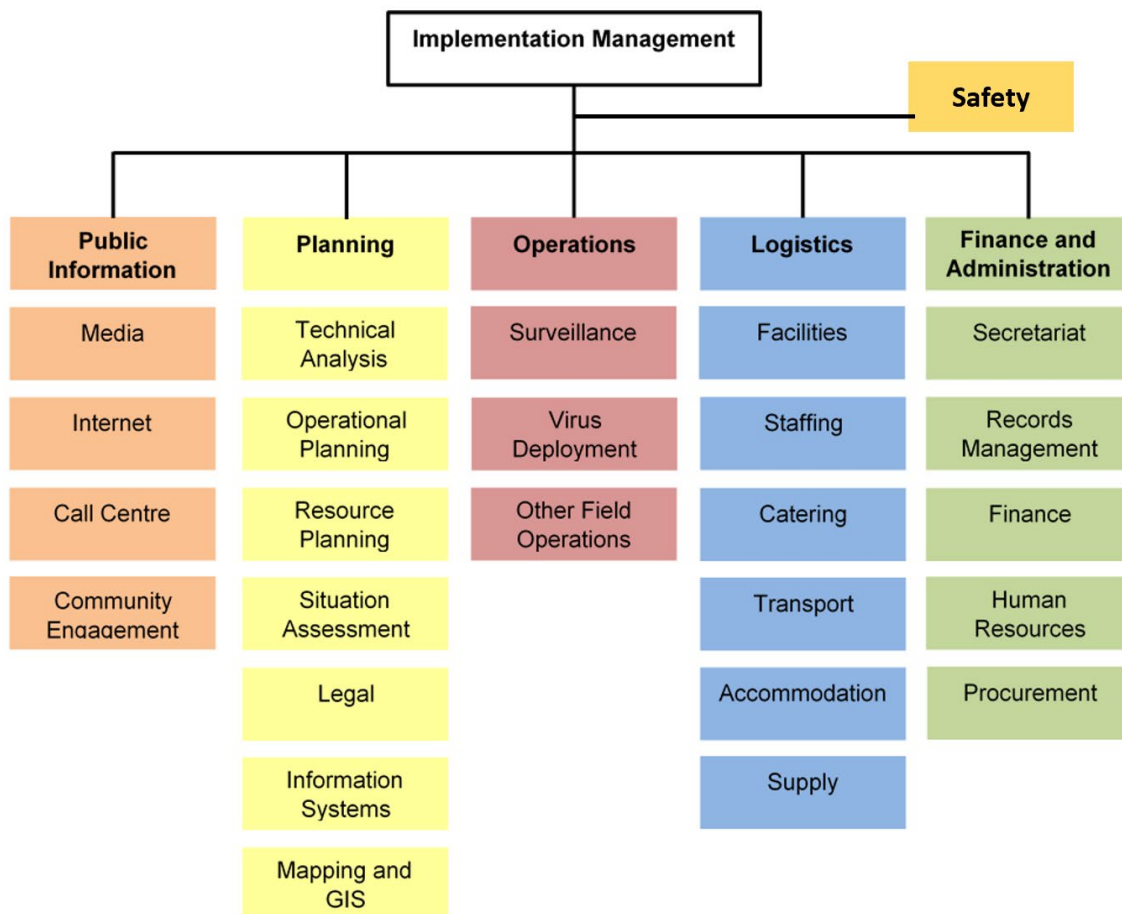


Figure 1 Diagrammatic representation of Incident Control Systems (ICS) functions and the sections typically within each function

4.3 Coordination and control management structures

National Implementation Group

A National Implementation Group (NIG), comprising Australian and state and territory government agency representatives will provide overall strategic policy, planning and technical guidance, and coordination of the implementation planning across jurisdictions. The agency representative from each state and territory will come from the nominated lead agency of the state or territory. The NIG will form a vital link between national aspects of the implementation and the individual jurisdictions.

To ensure alignment in actions across the jurisdictions the NIG will coordinate the development of implementation plans at state and territory level. This coordination will focus on aspects of virus deployment including alignment of activities to agreed deployment timeframes and availability of resources.

The NIG will access scientific and technical experts including those from the Commonwealth government, universities, and non-government organisations and agencies to inform and guide the technical development and implementation of the NCCP. The NIG may form a technical advisory group to support their decision-making for technical and scientific matters.

State and Territory Coordination Groups

Each state and territory will have a State or Territory Coordination Group (SCG) with the responsibility for coordinating the development of a state or territory implementation plan and implementation of their plan through RCCs within their jurisdiction. Each SCG will be multi-agency to support input from agencies that will have a key role in the delivery of the aim and objectives for the jurisdiction. The multi-agency SCG will improve shared understanding of NCCP implementation. The nominated lead agency for the state or territory will have the responsibility for the formation and management of their SCG.

Each SCG will provide strategic policy, planning and technical advice and coordination of implementation planning activities across their jurisdiction. This group will manage risks at the strategic level that are likely to be associated with the deployment of CyHV-3. Each SCG will work with their counterparts in adjoining states and territory to support cross border operations at the regional control level.

Each SCG will have a State Coordination Centre (SCC) at a location decided by each state and territory. Whilst the functions of a SCC will operate as one or a single coordination centre, it may be likely that not all functions and their roles will need be co-located in the SCC.

Regional Control Teams

Each Regional Control Team (RCT) will manage the operational aspects of implementation at the regional control level for a designated area that is part of a catchment or a river system. There is likely to be more than one RCT in each jurisdiction at any one time. For shorter or smaller waterways and catchments there is likely to be a single RCT. For the larger and more complex waterways and catchments there will be multiple RCTs along the length of the waterway.

Each SCG has the responsibility to form each RCT and designate the area of responsibility for each RCT. The designated area for an RCT could be defined by criteria such as:

- operational considerations such as span of control, travel distances, centres to resource operations,
- prioritised areas for CyHV-3 deployment,
- connections and barriers between waterways and carp populations (i.e. carp population connectivity),

- geomorphic characteristics of the catchment, and
- community and industry demography of an area or region.

Each RCT will deploy, expand, contract and stand down in response to changes in scale and complexity of operational activities and needs in their designated area. The RCT will have primary responsibility for planning, conducting and supporting all operational activities in their designated area. Each RCT will deploy field teams to undertake specific implementation tactics such as community engagement, surveillance, virus deployment, and carcass management. The RCT will comprise the managers for each of the ICS functions.

An RCT, with the support of the relevant SCG, may form a regional advisory group. This group would bring together representatives of key local stakeholder groups or enterprises from the designated regional control area. Such a group would be able to provide advice and information to inform planning and field operations, and provide a pathway for feedback to and from the stakeholder groups.

Each RCT will operate from a designated RCC that may be supported by one or more Forward Command Posts (FCP) depending on the scale and complexity of the field operations. Each RCT will report to a SCG through their SCC.

5. Timing

NCCP implementation (if governments ultimately choose to proceed with it) would initially be for three years with a further fourth year of regional control field operations subject to a review of the outcomes of the first year of field operations (see Figure 2). This timeline is indicative only.

The first year for implementation would be primarily for development of the national and state and territory arrangements and strategic coordination planning at jurisdictional level to develop an implementation plan for each jurisdiction.

The first regional control activity would be community engagement that would commence during the later parts of the strategic coordination planning. These community engagement activities at the regional control level would occur over at least one year with the first year leading into and continuing during the six to nine months for regional control implementation operations in the field.

The first year of field operations would be undertaken during the second year of the overall implementation. The field operations would include virus deployment, surveillance and carcass removal and disposal. A second year of regional control operations would be subject to the outcomes of a review of the first year of operations, and the need to deploy the virus in areas that were not treated in the first year. The final duration of the implementation of the NCCP would be subject to approvals and support from each jurisdiction, and specified review or trigger points in each state and territory implementation plan.

Several factors may necessitate an adjustment in the timing for field operations and in so doing result in variations to the indicative timeline. For example, prevailing climatic conditions may alter the aggregation of carp and/or changes in water temperature. These alterations may affect CyHV-3 deployment outcomes. Importantly, field operations would be initiated when the prevailing conditions support optimum outcomes from virus deployment (Figure 2).

Implementation co-ordination			Implementation tasks	
1 st year	<i>Implementation planning</i>	National Implementation Group	Regional and jurisdictional implementation plans and approvals	
	Formation of National Implementation Group National Implementation Group in place		Completion of implementation planning and approvals	
2 nd year	Formation of State/Territory Coordination Centre			
	<i>Indicative start of operations</i>			
	State Coordination Implementation Plan in place		Minimum Regional Control Centre opened	
	State Coordination activate Regional Control Centre(s)		Community Engagement initiated	
	State Coordination Centre coordination of Regional Control Centres		Operational preparations	
3 rd year	<i>Initial deployment subject to suitable preconditions</i>	State Coordination Centre	Regional Control Centre(s)	Community Engagement increasing presence
				Full Regional Control Centre activated (mid-winter)
				Regional Control Implementation Plan version 1
				Field Operations—surveillance, CyHV-3 deployment commence
				Carp aggregation (spring)
				Carcass collection/disposal
				Surveillance/monitoring on-going
				Autumn carp aggregation surveillance
4 th year	<i>Indicative secondary deployment subject to adaptive management</i>	State Coordination Centre	Regional Control Centre(s)	Regional Control Centre(s) stand down
				Further operations including more releases subject to outcomes from previous year

Figure 2 A diagrammatic representation of timeline for key activities to implement the NCCP

6. Implementation planning

Implementation planning will be integrated across multiple scales. The NCCP provides the national strategic intent and framework for jurisdictional and then regional implementation planning.

6.1 *Jurisdictional implementation planning*

The strategic intent and objectives together with the overall deployment strategy articulated by the NCCP will be translated by each state and territory to produce their jurisdictional implementation plan. Each jurisdictional implementation plan will need to reflect any commitments to relevant legislative approvals at the state/territory and Commonwealth levels.

Each jurisdictional implementation plan will reflect the nationally agreed outcomes including timeline(s) for carp virus deployment. Each jurisdictional implementation plan will provide the overall strategic intent for operational aspects of virus deployment and management of associated strategic risks (political, environment, economic, social/community, technical/science, operational, legal, media and communications).

The planning for implementation at the strategic coordination level would take place over one to two years before field operations are initiated at regional control level.

As described in the NCCP each state and territory implementation plan should include:

- clear management/operational objectives and strategies at local and regional scales consistent with the NCCP implementation objectives and virus deployment strategy,
- risk assessment, incorporating social, environmental, and infrastructure risks for CCAs, with options for mitigation,
- schedule for release based on predicted conditions and then amended based on surveillance and investigations,
- CCA-specific virus deployment methods targeting carp sub-populations and aggregations consistent with the NCCP Implementation Strategy and epidemiological research,
- Standard Operating Procedures (SOPs) and operational systems,
- mapping waterway access points, transport, and disposal/utilisation requirements for dead carp biomass) and obtaining associated approvals and permits,
- mapping carp aggregation locations,
- assessment of impacts from stock and domestic use of non-treated water
- location of regional control and state and territory coordination centres,
- Assessment of risks to Matters of National Environmental Significant (MNES) under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and other legislative requirements for implementation,
- contingency planning for unexpected risk mitigation,
- stakeholder engagement and communications strategies,
- coordination policies across regions, states and territories,
- establishment of virus deployment evaluation and reporting requirements and associated procedures, and
- assessment of the potential for supporting measures such as carp population reduction by physical removal before release in sensitive locations.

The matters addressed in the implementation plan of each state and territory should contain the same content. This content may include but not be limited to key headings and suggested content as outlined at Appendix 1.

6.2 *Regional implementation planning*

Planning for field operations and undertaking operational activities and decision-making relevant to the deployment of the carp virus including the management of associated risks will be undertaken at the regional control level of management. The strategic intent and supporting policies from the state or territory implementation planning will guide and inform the development of operational aims and objectives for each regional control area.

Each regional control area will develop and maintain a regional control implementation plan. Each of these plans is likely to undergo changes that will reflect changes in the understanding of the operational risks and variables within the regional control area. Information collection, collation, analysis and interpretation will inform the ongoing development of each regional control implementation plan.

For each regional control area, the initial version of the regional control implementation plan will focus on community engagement activities, establishment of the RCC, and collection and collation of information to inform future operational activities. Subsequent versions of each regional control implementation plan will include the full range of control level activities for field operations.

Each regional control implementation plan will include resourcing requirements to support scheduled operational activities in advance of virus deployment. Updates to the plan will be informed by planning activities such as situation analysis arising from field surveillance operations.

The planning for each regional control implementation plan must include identification and detailed description of the specific tactics and tasks for surveillance, virus deployment, and carcass management and disposal.

The duration of these regional control level planning activities should be months rather than years. Like the state implementation plan, the regional control implementation plan should clearly describe tasks that will meet specific commitments.

Regional control level planning should make use of local knowledge and seek contributions from local stakeholders including environmental management groups, waterway managers, enterprises and agencies and indigenous groups, local and district emergency management committees, and local governments. Business enterprises such as those linked to tourism where relevant may also be able to make contributions to the planning at the regional control level.

The key points in regional control implementation plans are similar to those in the state or territory implementation plan. However, they are specific to the designated regional control area and described in detail to support implementation operations.

The overall regional control implementation plan is likely to be supported by more focused operational plans. The designated area for each RCC will be subdivided into areas that reflect relatively discrete areas of field operations. These discrete areas are likely to be defined by features on waterways, water flow characteristics, carp populations and aggregations, natural features and areas of significant natural value such as lakes, and on-water recreational activities.

Each of these areas will have specific operational needs that will inform the operational tasks and methods for each area. For each of these specific areas there should be a specific operational plan (a sub plan of the regional control implementation plan).

7. Implementation preparation

Virus preparation will also need to be undertaken well before field operations. When legislative approvals permitting the virus's release from the bio-secure facility in which it is currently contained are complete, production of virus for biocontrol operations can begin. The Australian Pesticides and Veterinary Medicines Authority (APVMA) stipulates that virus production for biocontrol must meet quality-control standards similar to those required for animal-health vaccines. Appropriate lab facilities will be engaged to produce field-ready preparations of the desired CyHV-3 genotype from virus stock supplied by the Australian Centre for Disease Preparedness (ACDP).

Virus formulations will need to be transported from storage sites to authorised locations for deployment by trained and authorised deployment staff. Transport protocols will be required to ensure physical security and minimal reduction in titre. If carp are to be infected by direct injection (see Technical Paper 2 for further discussion), the dose for infection of each carp will need to be determined.

7.1 *Regional teams*

Regional crews will be allocated to virus deployment, surveillance and monitoring, and carcass management. Regional operations will consist of a regional control centre and forward command centres.

7.2 *Operational preparation*

Operational preparation includes the following activities (as a minimum):

- identifying locally appropriate tactics for virus deployment, disease surveillance, and carcass management and disposal,
- implementing a case management system (CMS) to inform decision making,
- identifying and procuring human and physical resourcing requirements, including building capacity to rapidly deploy additional resources if needed,
- engaging with, and, where appropriate, involving, key stakeholders and organisations in implementation and governance,
- identifying appropriate locations for regional control centres and forward command localities,
- trialling and evaluating management methods and tactics,
- training and capacity building,
- implementing public engagement and communication strategies and actions consistent with jurisdictional and national communications, and
- identifying ongoing management and monitoring that may be required during the adaptive management period.

7.3 *Communications and engagement*

Communications and engagement will be one of the first activities involved in implementing carp biocontrol. Communications and community engagement would ideally start approximately one year before field operations and continue during operations. Effective communication will be important given the high level of community interest associated with carp kills.

8. Field operations

Field operations would begin with virus deployment and surveillance, and include all subsequent actions undertaken to manage associated risks. Operations would be enacted in accordance with regional implementation plans and legislative approvals, and co-ordinated within states and territories and across jurisdictional boundaries where required.

Monitoring carp aggregations and environmental conditions would be the first field activities. Initial virus deployment, informed by monitoring, would follow when water temperatures increase sufficiently to enable effective carp virus infection. Thus, through most of carp's eastern Australian distribution, the total field operation season is expected to span the period from approximately July–March. The exact timing of virus deployment and disease outbreaks will differ between regions based primarily on water temperature and the onset of carp aggregating behaviour. In general, water temperatures will permit infection and disease earlier in northerly and low-elevation areas than in southerly and upland areas.

Secondary deployment could begin during the second year of initial deployment or be delayed to year 3. Field operations would conclude with a surveillance period to ensure that all risks have been managed.

8.1 *Regional control operational activities*

Operational implementation would be undertaken in accordance with each regional control implementation plan through each RCC and coordination of the RCCs by the relevant SCC.

The key operational activities managed from each RCC will include:

- Virus storage and distribution (virus production will be coordinated at national and state and territory levels),
- establishment of RCC and FCPs,
- surveillance, including monitoring of water parameters and carp aggregation behaviour, carp carcass accumulation, and ongoing field monitoring of operational outcomes,
- preparatory actions for virus deployment including installation of temporary infrastructure (booms, nets, cameras, etc.) and setting of permanent infrastructures such as wetland regulators,
- virus deployment,
- management of carcasses including removal and transport of carp carcasses,
- removal of carp from waterways in the absence of CyHV-3 (remove carp by existing methods to reduce biomass before virus deployment),
- disposal and / or utilisation of carp carcasses, and
- implementation of public and community engagement and communication strategies and actions consistent with jurisdictional and national communications.

A range of other activities in support of field operations will be undertaken at an RCC. These may include:

- implementation of systems of management including case management system (CMS) to inform situational awareness, resource management systems including resource tracking and costs for resources, records management system and health, budget management system and safety system,
- human and physical resourcing requirements, facilities and services, including plant and equipment, materials, and supplies necessary to undertake identified actions, including building capacity to call on additional resources if needed to manage particular situations,
- implementation of standard operating procedures guidelines and policies,

- engaging and where appropriate involving key stakeholders and organisations in implementation and governance, and
- evaluation of methods and tactics.

8.2 Regional control functions

The organisation of regional operations will follow ICS functions as described below.

Regional function

The regional control function is responsible for the overall management of RCC and operational activities for a specified regional area of responsibility.

Planning function

The Planning function is responsible for the collection, collation, confirmation, analysis, interpretation and dissemination of information. This includes written outputs such as situation reports, plans including resource plans, risk assessments and technical advice. The function acts as an information processing centre, by providing information that contributes to the shared situational awareness of all personnel involved with the control centre, and informs decision making.

The Planning function works closely with the Operations and Logistics functions in compiling and maintaining key outputs such as plans, resource plans and situation reports. Operational planning will focus on the field activities undertaken within discrete operational areas (sectors and divisions) within the area of responsibility for a RCC. The Planning function includes the following key areas of activity.

Resource planning is responsible for overall tracking (not real-time tracking), projecting or forecasting the resource requirements such as facilities, equipment, human, financial and supporting resources and services required to achieve the objectives. Resource planning works very closely with the Operations and Logistics functions.

Situation assessment is primarily responsible for acquisition and maintenance of shared situational awareness and sharing of that 'picture'. This function collects, collates and confirms implementation information and produces and disseminates current information about the developing situation, including the production of regular situation reports for use with the RCC and for agreed external distribution.

Legal provides legal services and advice to ensure that implementation activities are conducted in accordance with relevant state, territory and/or Commonwealth and/or local government legislation. This may include but is not limited to:

- arranging legal instruments such as proclamations, delegations and orders,
- advising on the legality of proposed decisions and operational activities,
- providing legal advice on specific issues,
- briefing staff on their responsibilities regarding legal issues, and
- authorisation of personnel to enable them to conduct activities that necessitate legal powers.

Information Systems includes responsibility for the management of information management systems and for the production of the required outputs from the systems. The information management systems will be used across all functions in each RCC and also the SCC of the jurisdiction.

Mapping and GIS work closely with situation assessment and information systems to collate and interpret implementation-specific information, to produce appropriate products and outputs (e.g. maps, reports for use across the RCC including by field operations, planning, logistics and public information).

Operations function

The Operations function is responsible for the tasking and application of resources to achieve the regional control objectives as stated in the regional control implementation plan. The Operations function is responsible for managing and monitoring operational performance against the milestones and operational triggers for the regional control objectives.

The Operations function within a RCC has responsibility for the management and deployment of field teams, and where relevant, FCPs from which field teams work. Operations will include activities associated with virus storage and distribution, virus deployment, surveillance, and carcass collection and disposal.

Operations field personnel will be organised around teams for each of the tactics (e.g. surveillance, deployment). Operations activities will include:

- interaction with Planning to develop and update the regional control implementation plan including resourcing requirements, information requirements, operational risks and the development of operational sectors and divisions,
- source resources needed through Logistics to implement planned operational activities,
- manage and monitor implementation of operational activities, and
- ensure the health and safety of personnel including contractors involved in field operations and in the communities in which operations occur.

Logistics function

The logistics function is responsible for the acquisition, provision and maintenance of human resources and physical resources such as equipment, facilities, services and stores required to support achievement of the management and operational objectives set by the Regional Control function and the Regional Control Implementation Plan.

Logistics must have systems for tracking status—e.g. en-route, available, unserviceable, on site—of each category of and each resource together with relevant information such as cost for each resource (per unit resource and overall cost per tasking).

Logistics must ensure a records management system is in place for all electronic and hard copy information. This system should be established from the first day of activity by a control centre.

The logistics systems enable the tracking of progress against the budget allocations for a RCC.

Public information function

The Public Information function is responsible for the management of information to and from the local communities and stakeholders within a given RCC. This includes local communities including Indigenous communities and groups and the general public, people potentially affected by field operations, local businesses and the local media.

This function is responsible for internal outputs such as the Public Information Plan (to support the overall plan for the RCC) and outputs such as senior officer briefings, media releases, social media updates, draft replies to complaints and community updates that may include community meetings. The function takes a lead role with the call centre or equivalent (e.g. social media).

The function at the regional control level works in close collaboration with the same function at the SCC of their jurisdiction.

8.3 Strategy and tactics

Surveillance and monitoring

Each RCC would manage surveillance and monitoring for their designated area of responsibility. Surveillance and monitoring would commence in conjunction with the activation of a full RCC and in advance of any deployment of the carp virus. These field activities collect information to inform planning for virus deployment and clean up and disposal of carp carcasses.

Surveillance and monitoring will continue throughout virus deployment and carcass management operations to collect information that informs ongoing planning, decision making around tasks and progress toward the objectives for each area of the waterway (e.g. progress with carp deaths by site). Surveillance and monitoring would likely continue until regional control aims and objectives are achieved.

Surveillance, including monitoring of water parameters such as temperature and flow, and information collection regarding carp aggregation(s) and movements, hazards, specific landholder support, infrastructure locations, locations for boom or similar deployment, and access points to waterways, will inform planning for field operations.

In preparation for deployment and subsequent carcass management, surveillance may undertake tasks such as pre-emptive deployment of booms and nets. Progressively these types of actions would be undertaken by the carcass-management teams. Surveillance teams of a RCC are likely to be operating at the same time as deployment teams and carcass management teams.

Surveillance methods may include a combination of activities such as:

- interviews with landholders, land managers and waterway managers,
- reconnaissance by field teams on land and water,
- aerial reconnaissance using drones and/or rotary aircraft,
- cameras of different types, (e.g. existing cameras on waterways and those used by wildlife researchers, strategically placed on waterways),
- liaison with local communities including indigenous communities, and
- use of imagery from various library sources.

Information collected by surveillance should be collated in an information management system(s) such as a Case Management System (CMS) that allows analysis, interrogation and presentation of the information in different formats e.g. maps.

Virus deployment

The most effective virus deployment strategy will target as many aggregations as possible within each carp sub-population over a relatively narrow time period when carp aggregating behaviour and permissive water temperatures for CyHV-3 infection and disease coincide (Technical Paper 2). This window will generally occur between September and November (spring and early summer), with local variation depending on latitude and elevation.

Outbreaks of the disease caused by CyHV-3 will be influenced by carp seasonal movements (Technical Paper 2). Adult carp move to access suitable spawning habitat in early spring, forming large aggregations immediately prior to spawning. These aggregations provide the opportunity for large numbers of carp to have physical contact with each other and in so doing initiate outbreaks of the disease caused by CyHV-3. Following virus deployment, disease is expected to gradually move through aggregations over three to four weeks in spring when the water will be within the permissive range for CyHV-3 infection and transmission.

It is critically important that sufficient CyHV-3 is deployed into each targeted carp sub-population and their larger connected population (meta-population) to ensure ongoing transmission of the virus in subsequent years.

The priority carp sub-populations to target include:

- those that are part of the same connected system to mitigate possible development of herd immunity (Technical Paper 2),
- those in which carp population density is high (i.e. above approximately 150 kg/ha), and
- those in which highly successful carp reproduction provides a source for population growth ('hotspots')

A targeted virus-deployment approach is necessary as it would probably not be possible to deploy CyHV-3 in sufficient concentrations across all carp sub-populations simultaneously to achieve initial knockdown and ongoing carp suppression. The implementation plan at state or territory level should outline the priority areas targeted for virus deployment. Each regional control implementation plan should describe in detail each area within the area of responsibility that will be targeted for deployment, and outline a proposed schedule based on predictions of the environmental conditions (including water temperatures) required for virus deployment.

Strategy for CyHV-3 deployment

Each state implementation plan will need to detail the approach across each state or territory including a preliminary or indicative schedule for virus deployment into aggregations within sub-populations. Schedules should include detailed breakdowns into targeted areas for each regulated system. The breakdown into targeted areas will reflect the allocation of each designated area for each RCC. Each regional control implementation plan should include specific information regarding scheduling and timing, surveillance and monitoring to assess aggregations and water parameters including temperature and flow.

Planning for deployment as part of each regional control implementation will need to encompass:

- local carp aggregating behaviour,
- potential aggregation sites, including those created by natural or man-made features,
- opportunities to create aggregation sites by using booms (or similar equipment) and/or alterations to water level and/or opportunities to attract carp to an area (e.g. baiting),
- predicted biomass along the waterway and especially areas of high biomass, impact,
- access points for field teams to reach known or potential aggregation points or areas of high carp concentration so carp can be caught (if needed) and exposed to the virus to initiate outbreaks,
- waterway features including weirs, fords etc and/or water parameters such as cool inflows that may influence aggregation opportunities and/or negatively affect opportunities for carp virus infection and disease, and
- waterway hazards for field teams that may affect their ability to deploy the virus and undertake related tasks.

Each RCT will need to develop a specific plan or mini-plan for each of the identified areas of operations within their waterways. The context of each area will necessitate different approaches to CyHV-3 deployment.

Carp carcass management

Carp carcass management will be necessary to address potential direct risks to water quality, areas of natural environmental value, social amenity, infrastructure and indirect effects such as the risk to tourism and recreational activities.

Each state and territory implementation plan should include risk-management measures at the strategic level. Each regional control implementation plan will detail very specific management measures and actions to address the potential risks for carp carcasses. As with virus deployment, specific plans may be required for each area of a waterway where operations will take place.

Carcass-management tactics will need to be closely coordinated with virus deployment. High biomass areas of carp aggregation may result in high localised carcass densities. Planning for deployment should be linked to planning for carcass management. Planning for carcass management will also require a sound understanding of the criteria used to plan virus deployment.

In addition to information relating to the waterway and water parameters, information will be needed on locally available options for disposal of carp carcasses. Carcass disposal options need to be assessed when planning carcass collection. Collection methods for carp carcasses are described below, with guidance on selecting a disposal method.

Carcass management should not automatically equate to carcass collection and disposal. Susceptible carp within any given sub-population will not all die at the same time. The carp carcass biomass is likely to appear over one to two weeks (as the virus gradually infects and kills susceptible carp) rather than just a couple of days. This relatively gradual progression of disease through sub-populations provides opportunities to manage risks including those to water quality. Options to inform the tactics for carcass management in regional control implementation plans and as described in the NCCP are described below.

Manipulating movement and distribution of live carp before CyHV-3 release:

- manipulating river flow and water level, including the use of permanent infrastructure (e.g. weirs, wetland regulators) to promote aggregation and concentration of carp in targeted sub-populations into low risk locations,
- manually removing carp (e.g. by netting or electrofishing) from targeted sub-populations in areas where the virus will not be effective (e.g. downstream of large dams where water temperature will be below the permissive range due to cold water releases), and
- manually removing carp from targeted sub-populations in areas where carp density and habitat traits pose risks to water quality.

Movement and distribution of infected live carp:

- using permanent and temporary infrastructure (e.g. floating booms and nets) to restrict movement of infected live carp into areas or habitat types where water-quality impacts are more likely to occur and/or have serious consequences, and
- using permanent and temporary infrastructure to contain infected live carp in areas or habitat types where water-quality impacts are less likely to occur and/or have serious consequences.

Movement and distribution of carp carcasses and nutrients:

- using regulated water flows and permanent infrastructure to assist the flushing of carp carcasses and nutrients,
- using regulated flow conditions and permanent and temporary infrastructure to intercept and remove carp carcasses at strategic locations (noting that river managers will not always be able to manipulate flows specifically to suit carp carcass management),

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- using regulated water flows and permanent and temporary infrastructure to divert carp carcasses away from locations where water-quality impacts are more likely to occur and/or have serious consequences, and
- using permanent and temporary infrastructure to contain carp carcasses in situ at locations where water-quality impacts are less likely to occur and/or have serious consequences.

Clean up and disposal of carp carcasses:

- physically remove (clean up) carp carcasses from locations where their accumulation cannot be avoided and water-quality impacts are more likely to occur, and
- physically remove (clean up) carp carcasses at upstream strategic locations to mitigate downstream impacts.

Manipulating movement and distribution of live carp before CyHV-3 deployment:

- manipulating river flow and water level, where possible, including the use of permanent infrastructure (e.g. weirs, wetland regulators) to promote aggregation and concentration of carp in targeted sub-populations,
- Manually removing carp (e.g. by netting or electrofishing) from targeted sub-populations in areas where biocontrol using the carp virus will not be effective (e.g. downstream of large dams where water temperature will be below the permissive range due to cold water releases), and
- Manually removing carp from targeted sub-populations in areas where carp density and habitat traits pose risks to water quality, or in other areas where strategically effective.

Movement and distribution of infected live carp:

- using permanent and temporary infrastructure (e.g. floating booms and nets) to restrict movement of infected live carp into areas or habitat types where water-quality impacts are more likely to occur and/or have serious consequences, and
- using permanent and temporary infrastructure to contain infected live carp in areas or habitat types where water-quality impacts are less likely to occur and/or have serious consequences.

Movement and distribution of carp carcasses and nutrients:

- using regulated water flows and permanent infrastructure to assist the flushing of carp carcasses and nutrients,
- using regulated flow conditions and permanent and temporary infrastructure to intercept and remove carp carcasses at strategic locations,
- using regulated water flows and permanent and temporary infrastructure to divert carp carcasses away from locations where water-quality impacts are more likely to occur and/or have serious consequences, and
- using permanent and temporary infrastructure to contain carp carcasses in situ at locations where water-quality impacts are less likely to occur and/or have serious consequences.

Strategic removal and disposal of carp carcasses:

- Physically remove carp carcasses from locations where their accumulation cannot be avoided and water-quality impacts are more likely to occur and/or have serious consequences (noting that physical removal will be difficult in some areas and habitat types), and physically remove carp carcasses from strategic locations (e.g. where carcass accumulation and/or ease of access facilitates collection, mitigating downstream impacts).

Mitigating impacts of decomposing carp carcasses:

- Aeration of waterways, flushing of cyanobacterial blooms, and native fish breeding and restocking plans (micro-endemic species focus—noting that this approach could also address potential prey switching impacts, as discussed in NCCP research project 15).

Removal of carp carcasses

Carp carcasses will need to be removed from some waterways when predetermined thresholds for carp carcasses are exceeded and/or when removal is triggered by the need to manage risks posed by carcasses (such as negative impacts on infrastructure and/or social amenity and/or the natural environment). Scaling up for carp carcass removal will be informed by the timing of carp aggregation formation and/or surveillance aimed at detecting a carcass presence and increase in carcass numbers. Resourcing will need to be in place well ahead of biocontrol operations. Surge capacity should also be in place to cope with an increased need to remove carcasses. The resources for carp removal whilst initially allocated to a targeted area of a waterway may move to other areas of the waterway within the designated area of an RCC.

Resourcing should allow for the advancing decomposition of carcasses post death. A dead carp will initial fall to the bottom upon death, and subject to prevailing water conditions may take two to three days before floating to the surface. Once on the surface, the underside of the carcass will deteriorate markedly compared to the exposed side.

A number of methods could be used to physically remove carp carcasses from waterways and/or adjoining land. Methods may include the one or more of the following options. A combination of options is likely for any one waterway and areas along a waterway. Additional measures such as the use of booms, management of water flow and heights and local conditions (e.g. prevailing wind) can be used to support the deployment of one or more of these methods.

Collection of carp carcasses from boats and/or land adjacent to waterways

This method requires each carp carcass to be picked up by hand or scoop net. The majority of carp carcasses collected by this method will be from on-water, although some could be collected from land and/or shallow water adjacent to waterways.

Where vehicle access is possible, carcasses on land along a waterway and on adjoining land could be collected by land-based teams including some wearing waders. Land-based teams could be supported by small plant such as loaders where there is the need to remove the carcasses. This method is labour intensive with a low return on effort. Where a waterway presents hazards such as multiple snags, tree stumps and tree stags that will restrict the use of even a shallow-draft flat-bottom boat, teams of kayaks and canoes can be used to reach areas that would otherwise not be accessible. The canoes and kayaks could be supported by rotary aircraft. The aircraft can be used to deliver the crews and their equipment to the otherwise inaccessible sites. The aircraft could be used to extract loaded bulk bags or biohazard bags where the decision is made to remove the carcasses from the site. Small watercraft such as kayaks and canoes and small flat-bottom boats are also well suited to use in areas of high environmental value where larger boats may disturb the environment. Collected carcasses could be placed in containers such as bulk bags and/or hazardous waste bags that support bulk handling for unloading and transport (handle each carcass once).

Boat Trawl

This method will support the collection of a relatively large number of carp carcasses that will need to be removed from the trawl nets. Carcasses will usually need to be removed from the net(s) by hand. For some locations the net trawl could be worked from a land base, and vehicles and/or plant used to recover the net(s). This approach is similar to the beach-hauling method used by commercial fishers working from beaches.

Nets—Drop and Seine

The deployment of nets is largely as for boat trawl. This method could enable collection of relatively large numbers of carp carcasses provided the waterway features allow deployment of nets. Man-made structures across waterways may also provide opportunities to use nets.

Vacuum Collectors

Large mobile vacuum units have increasingly been used for a wide range of applications since their introduction about 20 years ago. Such units may be useful for collecting carp carcasses at sites where carp have aggregated and/or become confined by man-made or natural features. Depending on the technology used, the method may avoid the need for additional handling to load for transport of the carcasses.

Mechanical Collectors

Mechanical collection of various materials from waterways has become increasingly common over the past two decades. Mechanical harvesters are used to remove unwanted aquatic weeds from waterways. The harvesters collect and load on-water with minimal labour requirements. There are currently relatively few aquatic weed harvesters in Australia.

Similarly, collectors that gather floating garbage from waterways have become common in some cities globally. These platforms allow for manoeuvring of the craft in relatively confined areas to scavenge and load floating waste of all shapes and sizes. The collection craft loads the scavenged waste to enable relatively easy unloading for transport. The more recent versions of these craft are able to operate independently of the need for a person on board and include algorithms that support the screening and separation of the collected materials.

Use of heavy plant

Heavy plant such as excavators are able to collect and load large quantities of carp carcasses in a relatively short time. The plant could be very effective in areas where carp have been confined by man-made or natural features and/or where water levels have been manipulated to concentrate carp in a designated area. This approach has been used by commercial carp fishers in Australia.

This method would be applicable where the carp have been attracted to a confined area using artificial feeding or in an area where there is a freshwater inflow that will attract carp. The heavy plant can be used once the carp are confined to a defined area.

The use of heavy plant may not be restricted to use from land. An excavator using a suitable bucket attachment and operating from a floating platform should be able to scrim and gather carp carcasses. The use of an excavator on water has been used by various aquatic-based industries in Australia.

Selection of carcass management methods

The selection of methods to physically remove carp carcasses should be on a case-by-case basis for each area of a waterway. Each waterway will present different opportunities and challenges for each method. Decision-support tools for selecting carp carcass collection and transport methods, supported by a risk assessment, could be undertaken during planning.

Factors associated with compliance with legislation, codes and licences should be addressed during state and territory implementation planning. Compliance with these requirements should be finalised before implementation operations commence at regional control level. Factors to inform a decision about a suitable carcass management strategy or methods include the following.

Predicted biomass of carp carcasses

The weight of carp carcasses will have a relationship to the starting carp biomass. Predictions of carp carcass weights should include consideration of local conditions such as water flow rates, which are known to influence carp abundance. A stated trigger point (e.g. weight of carcasses per volume or area of water) can be used to inform the decision to collect carcasses to the greatest extent possible throughout a waterway or in a targeted manner focusing only on key risk areas.

The presence of dead carp alone may not necessarily trigger a need for a mass collection method(s). The outcome of the carcass collection is to reduce the biomass below approximately 150kg/ha. In some instances, such as where social amenity risks occur, most carcasses will need collection regardless of the carcass density/biomass.

The potential condition of the carp carcasses will also demand consideration when planning collection efforts. Carcass condition will vary, reflecting time elapsed since the carp died and exposure of the carcass to the prevailing conditions including water flow and temperature, and weather.

Threat to the operability of infrastructure and/or water quality

An assessment of threats to infrastructure from predicted carp-carcass biomass could inform decisions around collection methods and supporting actions. Local mitigation activities can be developed and used by one or more infrastructure managers to manage infrastructure threats in support of any method of collection.

Social amenity

The presence of carp carcasses in some areas of waterways may affect local social amenity. Reduced local amenity is more likely in populated areas near waterways and areas frequented by recreational users such as tourists. Targeted collection methods supported by community engagement activities may reduce the need for more widespread carcass collection.

Cost to deploy a method and return on investment

The costs for each method are not equal. Likewise, in the short-term, return on investment is unlikely to be equal for each method. Manual collection may be satisfactory for small, targeted sites in terms of cost and return on investment. On waterways where numerous sites require carcass management activities, manual clean-up is unlikely to be sufficient as a stand-alone approach. Mechanised clean-up methods will generally be more effective and efficient—with return on investment for mechanisation needing to spread across more than just one targeted site or single use.

Resource availability

The successful execution of each collection method will depend on availability of resources when needed, and both capability of the method and the capacity of the method. The ability to have the right resource in the right place at the right time and with sufficient capacity will underpin the successful adoption of each method. Competition for resources may arise within and between RCCs, and similarly between states and territory.

Waterway features

Validated during the preparatory surveillance, information on waterway features such as hazards, flow rates, aggregation sites, ability to manipulate water flows and levels, infrastructure, and access are likely to support adoption of some collection methods and work against other collection methods.

Potential impact on non-target species

The ability of a collection method to target carp carcasses and minimise potential collateral damage on non-target native species may be a consideration for an area(s) of a waterway.

Forecast weather

The effectiveness of field operations may depend on weather conditions. Weather conditions may affect the ability to complete one or more collection techniques and/or affect the timing of collection activities. For example, very hot weather may point toward mechanisation in preference to manual collection. Heavy rainfall may likewise affect carcass distribution (by increasing river flow and runoff) and influence the suitability of one or more collection methods.

Unloading and transport access

On-water collection methods will need efficient unloading of collected carp carcasses for transport to a disposal site(s). Bulk handling of carcasses at the point of collection should support good materials handling practices.

Transport of carp carcasses should be relatively straightforward provided there is good access for the loading of carcasses. The risks around the transport of carcasses are understood by the waste management industry and biosecurity emergency responses. Existing practices can be utilised.

Health and Safety risks

The selection of a method(s) for removal of carp carcasses should aim to use the method(s) with the lowest health and safety risks for the personnel executing the method, any personnel associated with further processing and/or disposal and the community.

Disposal of carp carcasses

Disposal of carp carcasses should be undertaken in parallel with carcass collection. Carcass disposal options are numerous, but the availability of disposal methods will vary from area to area. Ready access to one or more disposal options that can be integrated with carcass collection is likely to be a factor in selection of collection methods.

Potential disposal options for carp carcasses may include

- deep burial using existing approved landfill site,
- deep burial using new greenfield site and construction,
- above-ground burial using existing approved landfill site,
- above-ground burial using new greenfield site and construction,
- rendering at commercial facility,
- industrial disposal (e.g. power station),
- incineration at commercial facility,
- composting using existing approved facility or site,
- composting using greenfield or new site,
- leave lying on ground (nil treatment except remove from water), may be varied by ploughing/discing into ground,
- burning with solid fuel such as wood,
- burning with fuel such as coal, and
- commercial use (e.g. carp fertiliser).

The outcomes for some options may be enhanced by additional treatments. For example, increasing the surface area of carcass biomass by chipping or equivalent may enhance the outcomes from composting.

Selection of methods to dispose of carp carcasses

Carcass disposal methods should be selected on a case-by-case basis. An appreciation or similar decision-support tool and risk assessment should inform the decision to select disposal methods. Potential factors for selection of a disposal option(s) may include:

- existing availability and access to disposal option(s) and the need to develop greenfield options,
- predicted biomass of carp carcasses over time for disposal,
- cost including the immediate costs such as cost per tonne for use of existing facilities, construction costs for greenfield sites, and on-going long-term costs such as ground-water monitoring,
- local environmental affects that may be both positive and negative (this does not take account of long term affects such as contribution to climate change),
- lead time for preparation of the option,
- legislative requirements and approvals,
- resource needs and availability,
- risks including those around workplace health and safety, and
- social factors such as amenity and community support.

Table 1 shows the potential interactions between factors that may influence the choice of a disposal option and each disposal option. From the table it can be seen the use of already available options such as those with existing facilities and sites deliver better outcomes than constructing and/or

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developing new facilities. Capacity or the ability to handle the predicted carcass biomass for an option as well as available capability must be validated as part of planning before implementation operations. There should be capacity to process the predicted carcass biomass over time, not just a single point in time.

Table 1 Interaction between disposal options and factors influencing the decision to select an option

Factors	Cost to Prepare and Manage	Long term Costs e.g. Monitoring	Environmental impact	Ease of Construction and Use	Preparation Time	Legislative Requirements	WHS Risks	Resource Needs
Disposal Options								
Deep burial—new construction	★	★	★	★	★	★	★★	★
Deep burial—existing approved landfill site	★★★★	★★★	★★★★	★★★★	★★★★★	★★★★★	★★★★	★★★★
Above ground burial—new construction	★★★	★★★	★★★	★★★	★★★★	★★★	★★★	★★★
Above ground burial—existing approved landfill site	★★★★	★★★	★★★	★★★★	★★★★★	★★★	★★★★	★★★★
Rendering at commercial facility	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Industrial disposal e.g. power station	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Incineration at commercial facility	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Composting—new site	★★★	★★★★	★★★★	★★★	★★★★	★★★	★★★	★★★
Composting—existing site	★★★★	★★★★	★★★★	★★★★	★★★★★	★★★★★	★★★★	★★★★★
Leave lying on ground (nil treatment except remove from water)	★★★★★	★★★★	★★★	★★★★★	★★★★	★★★	★★★★	★★★★★
Burning with solid fuel such as wood	★★	★★★★★	★★★	★★★	★★	★★★	★★★	★★★
Burning with fuel such as coal	★★	★★★★★	★★★★	★★★	★★★	★★★	★★★	★★★
Commercial use e.g. carp fertilizer	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★

★ one star means a poor outcome comparatively with other options (e.g. one star for environmental impact means high environmental impact).

★ ★ ★ ★ ★ five stars means best outcome comparatively with other options (e.g. five stars for cost means a low-cost option).

9. Resourcing

Resource planning at state and territory level and regional-control level should establish the resource requirements to complete all tasks at both levels. This planning should include surge capacity at regional-control level. A resource plan would detail the resources required by tactic, when the resources are needed, their source or provider, capability and capacity. This information will likely be needed well in advance of field operations to identify contractors to complete much of those operations.

States and territories will need to liaise closely during implementation planning to develop a shared understanding of resource needs and sources of resources to ensure some resources that may be rate-limiting such as weed harvesters used for carcass collection are used to the best national advantage.

More than one FCC is likely to be operating in a state and territory at one time, and field operations are likely to be simultaneous. Capacity, capability and availability of key resources should take account of the simultaneous operations resource needs.

9.1 *Personnel and facilities—SCC*

The majority of the people in the roles of the key ICS functions are likely to be from government agencies—either from the lead agency of the state and territory or from a number of supporting agencies in the state or territory.

With the SCC operating for at least three years and a fourth year very likely, it would be preferable that each key role of an SCC be filled by the same person for the duration of the NCCP implementation to give continuity from planning to implementation.

The SCC will need adequate facilities to accommodate the onsite function managers and the supporting personnel. The location of the SCC will be determined by each state and territory.

9.2 *Personnel and facilities—RCC*

Personnel operating at the regional level are likely to be mostly non-government staff. Key functional managers may be government staff but this may not be necessary in some states and the ACT (the only territory likely to be involved in carp biocontrol if it proceeds). Depending on the scale of regional operations each RCC is likely to have 15+/-5 personnel working within it once fully operational (excludes field operations personnel).

The skills and knowledge necessary to take on the manager and supervisor roles in an RCC will be significant. Similarly, some roles will require specific knowledge, skills and qualifications e.g. community engagement, GIS and mapping.

The use of local people in an RCC should be encouraged. Local people will have valuable knowledge and, following the main biocontrol implementation phase, may be able to continue with follow-up or supporting activities (e.g. ecological restoration initiatives designed to maximise the environmental benefits of carp reductions).

How personnel are engaged to work in an RCC will be up to the state or territory. The personnel could be employed, provided through an employment agency, or be part of a contract to deliver a service. Each RCC should be located within their designated area of responsibility and typically would be in a regional centre that can provide adequate resources including personnel and facilities for field operations.

9.3 *Personnel—RCC field operations*

Field operations will require significant numbers of personnel to undertake surveillance, virus deployment, carcass collection and disposal. Staffing requirements will vary between RCCs and should be determined as part of the planning for implementation for each RCC.

Whilst there will be the usual options such as to employ each person and/or source through an employment agency, an alternative approach would be to contract out the whole task. The successful contractor would supply the personnel as well as other resources to complete the tasks as specified.

Consideration should be given to accessing and using local service providers and enterprises. These may include but are not limited to commercial and licenced fishers and Indigenous groups with an association to the designated area(s) of operations. Local knowledge possessed by these groups will be invaluable during both planning and field operations. Overall costs are also usually lower for locals.

The engagement of community volunteers should be managed carefully. Community volunteers who are sometimes referred to as spontaneous volunteers should be engaged in accordance with state and territory policies including those associated with health and safety, licencing requirements such as for operating boats and compensation arrangements. The engagement of community volunteers should not be automatic.

9.4 *Resources other than personnel*

The responsibility for provision of resources such as services, stores, consumables and equipment for personnel implementing carp biocontrol will rest with each state and territory. Procedures will usually include a list of resources needed to complete the task. Procedures should inform resource inventories.

The time available for implementation planning provides the opportunity to develop a very detailed inventory of services, stores, consumables and equipment that will be needed for the regional control operations. Developing this inventory will provide the opportunity to identify suppliers and contractors well ahead of when the resources will be required for implementation at regional-control level. Surge capacity should be built into the inventory.

10. Policies and Procedures

Implementing a carp biocontrol program would require access to and use of many government agency policies that provide the framework and arrangements for everyday government activities. Many of the existing policies will be directly applicable to the NCCP whilst others may need some variation to ensure applicability. The need for new or additional policies may be relatively small. Each policy must be compliant where relevant with the relevant legislation and/or equivalent such as legal agreement.

Policies relevant to implementing carp biocontrol may be from more than one government agency (e.g. water, environment and primary industries including fisheries). In some situations, local government policies may also be locally applicable (e.g. waste disposal).

Each policy may be part of a larger framework such as a quality management system. New and/or varied policies should be integrated into the relevant system.

Where a contractor(s) is engaged to complete full or part activities to implement carp biocontrol, the contractor should demonstrate they have appropriate policies and/or procedures for their designated activities.

10.1 Administrative/corporate policies

Some examples of government administrative policies and business rules that are likely to be directly applicable to implementing carp biocontrol are

- government agency values (code of ethics/conduct or equivalent),
- employment including recruitment and contracting, and engagement conditions including engaging personnel from employment agencies,
- industrial agreements and arrangements including conditions of employment, entitlements, hours of work, leave, accommodation,
- work health and safety and well-being,
- information security—management/use of private information,
- authorities/delegation—financial and non-financial,
- equity and diversity including management of cultural/Indigenous matters,
- financial reporting and budget management,
- procurement/contracting/service acquisition and agreements,
- access to government agency information network(s),
- privacy/release of public information,
- customer service,
- risk management,
- fraud,
- prosecution, and
- use/application of relevant legislation.

Some government agencies have variations to their policies to accommodate any potential change in context. For example, there are policies relating to accommodation during emergency responses that are additional to the everyday policies relating to accommodation. The policies with such variations may be applicable to biocontrol implementation subject to the conditions described in the relevant policy. This does not mean that carp biocontrol implementation should be interpreted as an emergency situation; rather the context may be the equivalent to that described in the relevant policy.

10.2 Operational policies

Field and related activities of biocontrol implementation would need to comply with a wide range of government-agency policies that are likely to be specifically relevant to carp-control operations. Operational policy topics relevant to the NCCP operations may include

- operating on waterways or similar including use of watercraft/boats,
- pest animal management,
- protected/threatened animals including permitted activities and required permits,
- animal welfare,
- destruction of animals,
- use of aircraft including rotary, fixed wing and drones,
- use of community/spontaneous volunteers,
- use of government agency resources by non-government agency staff e.g. vehicles,
- authorities/authorised officers under specified legislation,
- environmental management including for fish habitat and conservation,
- waste disposal and management including the need for relevant licences,
- compliance and enforcement including but not limited to fisheries,
- biosecurity including reporting of suspected pests/diseases, minimising spread of pests/diseases, and entry/exit to premises with a classified status and or subject to regulatory instruments,
- chemical use and handling,

- provisions such as licences or permits for fishing and the taking of fish from waterways, management of by-catch, and
- transport and handling of materials such as dangerous goods.

A validation activity will need to be undertaken to show whether a relevant policy(s) can be applied to carp-biocontrol operations without change or whether variations will be required to make the policy(s) applicable, (and conversely, to ensure that carp-control operations comply with the relevant policy(s)). Private enterprises within the area of responsibility of a RCC may also have policies that will apply to any operational activities on the enterprise (e.g. biosecurity requirements, conditions of entry to enterprise).

10.3 Potential new policy(s) for implementation of carp biocontrol

Potential additional/new policies to that are likely to be specific to the implementation of carp biocontrol may include

- Governance and management arrangements for the Plan that include membership details of national-level groups and the requirement(s) of the state or territory lead agency.
- Policies associated with the use of CyHV-3 as a control agent including
 - deployment of CyHV-3 in waterways,
 - exposure of managed or pet carp to CyHV-3,
 - policy to support any changes to legislation to allow the use of the CyHV-3 for control of carp, and flow-on requirements from the registration of CyHV-3 for pest control, and
 - potential penalties or equivalent for unauthorised movement and/or use of CyHV-3 and/or any vaccine against CyHV-3.
- Policy(s) for investigating reports of CyHV-3 in non-target species and/or in non-target waterways or enterprises (e.g. in aquaria).
- Policy on the collection and/or use/re-use and/or disposal of carp carcasses from waterways (during the period covered by carp-control operations, and following their implementation).

10.4 Procedures, guides and supporting documents such as risk assessments

Procedures and operational guidelines usually outline the resources, safety and health requirements and actions to complete a specific task. The information in the procedure provides sufficient information to allow completion of the task by a person(s) who has been trained and/or is qualified for that specific task. A procedure or guideline provides the basis for consistency and predictability in completing a task. Procedures form a good basis for contracting or outsourcing a task.

Each procedure should be integrated into an overall system of management. There may be more than one procedure in a management system (e.g. for a Case Management System (CMS) there may be procedures for collection of the information in the field, entry and authorisation of information into the CMS software, and a procedure for running a report(s)).

Each procedure should be validated for applicability to the relevant context and as part of the management system. The system should include monitoring and review. Audit and compliance checks to check compliance with the procedure should be part of monitoring and evaluation. Procedures may be supported by other documents such as risk assessments, safe work method statements, work instruction(s) and industry standards and/or codes such as those for personnel protective equipment.

10.5 Administrative procedures

The everyday government-agency administrative procedures that may be applicable with few or no changes may include

- Induction into the workforce including code of conduct. Induction processes will need to include contractors and employment agency personnel.
- Normal government agency procedures for actions such as procurement, acquisition and management of resources (stores, equipment, services, facilities and personnel) and disposal.
- Recruitment and contracting of personnel (both government staff and non-government agency personnel).
- Specific working arrangement requirements—time sheets, travel, leave etc for government agency staff and employment agency personnel.
- Health and safety procedures including access to first aid and mental health/well-being services.
- Emergency procedures—in facilities and in the field.
- Incident reporting for work health and safety and damage to assets including vehicles.
- Application of delegations—financial and non-financial
- For employment agency personnel/contractors, specific working arrangements—time sheets, travel, leave, workers' compensation, supply of PPE/uniform.

10.6 Field operations procedures

Procedures that are likely to be present and may be applicable to implementing field operations with few or no modification(s) may include

- biosecurity procedures such as those for managing risks associated with spread of pest/disease/weeds (moving between and/or onto and/or from premises),
- decontamination—cleansing and disinfection of personnel, and/or equipment,
- legal instrument preparation, issuing and management,
- launch and recovery of watercraft or boats,
- working on water and/or operating watercraft or boats,
- disposal of sharps and other infectious or biohazardous materials,
- collection and transport of biological materials and samples,
- medical plan—emergency response arrangements for people,
- monitoring location of field personnel—including in remote and isolated areas,
- critical Incident Support System (CISS),
- property visits for surveillance and/or destruction and/or disposal (including collection),
- collection of information by surveillance/call centre (information collection and collation),
- allocation of status to a property of interest,
- working with/around heavy plant,
- working in/around aircraft—rotary and fixed wing,
- surveying for fish in waterways, and
- communications and media at local and jurisdiction levels.

Many of these procedures should have supporting documentation such as risk assessments. These supporting documents are of equal importance to the procedure itself, with some being required by legislation as well as supporting effective delivery of the procedure.

10.7 Procedures and supporting documentation to be modified for carp biocontrol

Procedures that are likely to exist and will require variation(s) and change(s) to contextualise for use in carp-biocontrol operations may include

- carcass loading and transport (currently present for livestock e.g. cattle and chickens),
- carcass disposal by various methods including burial (either deep and/or above ground and composting—examples available for livestock e.g. cattle and chickens),
- deployment of booms and nets or equivalent on/in water (examples available for research applications),
- use of field operations forms and the actual forms such as those for surveillance,
- collecting and maintaining fish from the wild, and
- Community engagement.

10.8 Procedures and supporting documentation specific to carp biocontrol

Procedures that are likely to be needed for operations and for which there may be no readily available equivalents may include

- induction into specific roles/activities of carp-biocontrol implementation (could be adapted from the biosecurity emergency response induction packages),
- most aspects of the use of CyHV-3 including inoculation of the virus into carp to be released into a waterway (may be adapted from a laboratory procedure),
- transport and storage of CyHV-3 to/from the field (and between supplier and field),
- sample collection from wild-caught carp,
- transport of samples collected in the field (could be adapted from laboratory manuals),
- Heavy-plant use on/near water (only if applicable),
- carcass disposal method(s) specific to carp biocontrol,
- call centre Question and Answer including processing of response,
- working in/on the water for collection of carp carcasses, and
- loading and unloading of carp carcasses from on-water (i.e. from vessels etc).

11. Manuals to support implementation

AIIMS ICS 2017 manual

This manual is not readily available on an external-facing web site. Most jurisdiction have a copy(s) of this manual. Agencies with responsibilities for incident management will hold a copy(s).

Some state and territory agencies may have their own version of ICS that will have been varied to accommodate the local context. Overall these versions with variations are still recognisable as AIIMS ICS.

BIMS 2012

The manual for BIMS can be found at:

<https://www.agriculture.gov.au/biosecurity-trade/policy/partnerships/nbc/nbepeg/bims>

Control centres management manual (parts 1 and 2) AUSVETPLAN

This manual provides a management structure for state- and territory-level (SCC) and local (regional RCC–LCC in this manual) levels and an information flow system. The content of the manual aligns with both ICS and BIMS, except it has been contextualised for emergency animal diseases.

The manual under Management Manuals can be found at

<https://www.animalhealthaustralia.com.au/our-publications/ausvetplan-manuals-and-documents/>

Operations manuals AUSVETPLAN

Manuals covering disposal and decontamination that may be useful at the regional-control level for field operations are part of the AUSVETPLAN library.

These manuals can be found under Operations at

<https://www.animalhealthaustralia.com.au/our-publications/ausvetplan-manuals-and-documents/>

State and territory operational procedures

Different agencies in states and territories maintain libraries of operational procedures and related documents. These documents cover a wide range of topics from coordination and control centre activities through to field activities. Each agency is likely to maintain its own library (e.g. environment agency, water agency, primary industries and/or fisheries).

Some of the agency libraries are accessible to the public through websites (e.g. NSW Department of Primary Industries), whilst others are inward-facing only and authorised access must be granted for use.

12. Glossary

Appreciation	An appreciation is a systematic approach to selection of options. It is a logical process of deduction, the aim of which is to determine, from information (confirmed or assumed), the best or better course of action or option to take in a given context.
AUSVETPLAN	Australian Veterinary Emergency Plan. A series of technical response plans that describe the proposed Australian approach to an emergency animal disease incident. The documents provide guidance based on sound analysis, linking policy, strategies, implementation, coordination and emergency-management plans.
Decontamination	Includes all stages of cleaning and disinfection.
Disinfectant	A chemical used to destroy disease agents outside a living animal.
Disinfection	The application, after thorough cleansing, of procedures intended to destroy the infectious or parasitic agents of diseases, including zoonoses; applies to premises, vehicles and different objects that may have been directly or indirectly contaminated.
Disposal	Sanitary removal of carcasses, materials and wastes by approved disposal method.
Environment	Has the same meaning as in section 528 of the <i>Environment Protection and Biodiversity Conservation Act 1999</i> (Commonwealth) and state or territory legislation.
Epidemiological investigation	In the context of the NCCP, an investigation to identify and qualify the efficacy (as a biocontrol agent) and risk factors associated with Cyprinid herpesvirus 3 (CyHV-3).
Exotic fauna/feral animals (fish)	Animal species that have been introduced to Australia by human beings either deliberately or unintentionally, especially since European colonisation.
Fomites	Inanimate objects (e.g. equipment, boots, clothing, vehicles, crates, packaging) that can carry Cyprinid herpesvirus 3 (CyHV-3) and may spread the virus to susceptible carp through mechanical transmission.
Forward command post (FCP)	A field operations centre, subsidiary to a regional control centre.
Human infrastructure	The man-made surroundings, including buildings, weirs, dams, utilities infrastructure, roads, fixtures, parks, transport corridors, as well as the housing and residential areas, commercial centres, pipelines and utilities, that can influence the natural environment.

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Impact	<p>In the context of the NCCP, 'impact' generally refers to the effects of the disease caused by CyHV-3 on</p> <ul style="list-style-type: none"> the environment or an ecosystem, including terrestrial, inland waters and marine environments, social amenity including negative impacts on human infrastructure or human health, including from zoonoses; and/or the economy, including negative impacts on human, animal or plant life, or health and relevant abiotic aspects of primary production and/or business.
In-contact animals (fish)	Animals (fish) that have had close contact with infected animals, such as non-infected animals in the same group as infected animals.
Incubation period	The period that elapses between the introduction of a pathogen into the animal and the first clinical signs of disease.
Regional control centre (RCC)	An operations centre responsible for the command and control of field operations in a defined area of a waterway, catchment or river.
Monitoring	Routine collection of data including by surveillance.
Movement control	Restrictions placed on the movement of animals, people and other things to prevent the spread of Cyprinid herpesvirus 3 (CyHV-3).
National Implementation Group (NIG)	The committee tasked with developing a national, strategic approach to managing the national implementation of the release of Cyprinid herpesvirus 3 (CyHV-3) for carp biocontrol.
Native wildlife	Animals occurring naturally in Australian ecosystems, or, in some instances, those that were brought to Australia by human beings in the ancient past.
Operational procedures	Detailed instructions for carrying out specific disease-control activities, such as disposal, destruction, decontamination and valuation.
Outbreak	In relation to disease means a local proliferation of disease cases. In the context of the NCCP, the term 'outbreak' is generally used with specific reference to the disease caused in European Carp or common carp, <i>Cyprinus carpio</i> , by Cyprinid herpesvirus 3 (CyHV-3).
Pre-existing cost-sharing arrangement	<p>In relation to an emergency response to a disease means:</p> <ul style="list-style-type: none"> the Government and Livestock Industry Cost-sharing Deed in Respect of Emergency Animal Disease Responses; and/or national arrangements in the health sector.
Public benefit	Occurs if Australian communities receive significant benefit from one or more NCCP activities regardless of whether the benefit is economic, non-economic, environmental or intangible.
Quarantine	Legal restrictions imposed on a place or a tract of land by the serving of a notice limiting access or egress of specified animals, persons or things.
Standard Operating Procedure (SOP)	A procedure that details the warnings, resources and actions or tasks necessary to undertake the procedure by a person with the relevant training and or experience.
Social amenity	Any tangible or intangible resources developed or provided by humans or nature such as dwellings and parks, or views and outlooks.
State or territory Coordination Centre (SCC)	The operations centre that directs and coordinates the regional control operations to be undertaken in that state or territory.
Surveillance	The systematic monitoring, over time, of an area and carp population(s) to collect data and information to inform planning and operations.

Susceptible animals	European Carp or common carp, <i>Cyprinus carpio</i> , that can be infected with Cyprinid herpesvirus 3 (CyHV-3).
Tracing	The process of locating animals, persons or items that may be implicated in the spread of Cyprinid herpesvirus 3 (CyHV-3), so that appropriate action can be taken.

12.1 Abbreviations

AIIMS	Australian Interagency Incident Management System
BIMS	Biosecurity Incident Management System
CISS	Critical Incident Support System
CMS	Case Management System
FCP	Forward Command Post
ICS	Incident Control System
NCCP	National Carp Control Plan
NIG	National Implementation Group
RCC	Regional Control Centre
RCT	Regional Control Team
SCC	State Coordination Centre
SCG	State Coordination Group

Appendix 1. Content for State/Territory Carp Biocontrol Implementation Plans

A. Situation

- Overview of strategic situation with carp in state or territory—catchments infested, current and predicted climate conditions including seasonal occurrence of optimum conditions for deployment of CyHV-3, information on flows in regulated waterways to be targeted for deployment
- Include maps, diagrams, graphs and pictures

B. Strategic overview for actioning the NCCP

- Outline and overview of the activities at the state or territory coordination level to prepare for the state-wide deployment of CyHV-3 and management of regional control operations through the RCCs.
- A timeline may be used to show the scheduling of activities over the 1–2-year period to develop and validate the engagement of agencies, arrangements, regulatory frameworks, policies and procedures and systems, etc necessary to ensure the timely delivery of implementation operations through the RCCs once activated.
- This section does not include the operational detail that will be found in each regional control implementation plan.

C. Strategic risk assessment

- Strategic risks and proposed management strategies for each risk.
- Risks should consider compliance with legislative requirements.

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- The strategic risk-management measures described may include development of policies and/or procedures that provide guidance for operational activities (e.g. guidance on when carp carcasses can be left in situ or must be removed). The content of such measures should be consistent across states and territories. The actual measures do not need to be described here in detail.
 - The risks at the regional-control level will be assessed and managed at the regional-control level with guidance by state and territory policies and procedures.
- D. Aim and objectives with strategy(s) and tactics**
- The state or territory overall strategic intent of the implementation of carp biocontrol is stated.
 - The state or territory Objectives that will support the delivery of the strategic intent.
 - The objectives should reflect implementation objectives described in the NCCP. These are
 - widespread reduction and long-term suppression of carp populations, targeted at high-density sub-populations and spawning hotspots and their connected systems,
 - management of environmental risks and no significant impacts on MNES,
 - management of risks to water quality for town water supply, stock and domestic water needs, irrigation, and cultural and recreational purposes, and
 - effective and efficient management of CyHV-3 deployment and carcass management.
 - If not otherwise shown, performance indicators or targets or milestones should be included to support monitoring of progress toward each objective, and inform decision points during implementation.
 - Performance indicators may include operational outcomes such removal of observed carp carcasses from areas of social amenity within a specified period (noting carp may keep appearing over time).
 - Triggers may include consideration of decisions or actions where milestones are not being met.
- E. Execution (operational activities) may include following activities that may be described in more detail in a supporting plan for each or a combination of the following activities:**
- Legal arrangements including any potential changes or amendments needed to support implementation, and relevant instruments.
 - CyHV-3 production and storage pre-distribution, distribution to RCC, storage and use at RCC, records management.
 - CyHV-3 state-wide deployment strategy including specific measures.
 - Information-handling systems (e.g. case-management systems for collection and collation of information).
 - Resource-management system including resource tracking and cost management.
 - Finance and budget management system(s).
 - Surveillance and monitoring at state or territory level. Given the actual surveillance will be at regional level, this provision need consist only of an overview of surveillance measures.
 - Identification and diagnostics subject to jurisdictional policies and procedures.
 - Management of CyHV-3 movement.
 - Management of risks for koi hobbyists and businesses.
 - On-water activities including surveillance and carcass collection.
 - Carcass transport and disposal.
 - Contractor engagement.

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- Administrative arrangements for staff, other agency personnel and contractors.
- F. Resourcing—staff, personnel, contractors, partners**
 - SCC personnel including whole of government participation,
 - RCC functions (for multiple RCCs),
 - field activities by each RCC, and
 - contingency and surge capacity for each RCC.
- G. Administration and financial-management arrangements**
- H. Communications, community engagement and media**
 - Strategic details and activities during the period of the strategic planning and subsequently once one or more RCCs are activated.
 - Could reference Communications Community Engagement and Media Plan.
- I. Governance and management**
 - Coordination and control including at the whole-of-government level in the state or territory, and regional control and state or territory coordination structures and location.
 - Whole of Government stakeholders
 - Partner and stakeholder participation
 - National level representation
 - Basis for authorities to act
- J. Performance indicators and milestones**
 - These should cover all activities associated with implementation and not just field activities e.g. communications and media, production of CyHV-3
 - Includes any review point(s) or triggers
- K. Budget**
 - Development and management of indicative total budget—detailed showing normal costs (in kind) and additional specific implementation costs for each functional area
 - Will need to demonstrate how costs are determined
 - Budget report format
 - Detailed tables supported by graphs

Appendix 2—Regional control implementation plan content

A. Situation

- An overview of the distribution, status, biomass, aggregations, etc of carp in the designated area of responsibility.
- Current climate and waterway conditions and parameters.
- Risk areas—infrastructure, environment including areas of significant environmental value, potential ecological impacts, social amenity.
- Operational subdivisions of the designated area of responsibility (discrete areas of operations).
- Maps, graphs and tables are encouraged.

B. Strategic intent and objectives

- These are specific for the designated area of responsibility but reflect those of the state or territory implementation plan.

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- Performance indicators, milestones and targets should be included to support monitoring toward the objectives and inform decision points.

C. Risks and management measures

- Details on risks and management measures specific to the designated regional control area and the implementation activities in that area.
- Risk assessment and management measures should consider the compounding effect of risks at this level.
- Specific risks will include those associated with actual deployment of CyHV-3, field operations including surveillance, carcass management, and community engagement.

D. Execution

- Details specific tasks, taskings and actions to deliver on the strategies and tactics.
- The taskings should detail what will be done, by who, where, and when (not how).
- Surge capacity should be referenced here. What are the arrangements for resourcing beyond the scheduled taskings?

E. Logistics and administration

- Details the arrangements for provision of logistics and administration support to the RCC (internal logistics) and field operations (external logistics).
- Budget-management information is often included here.

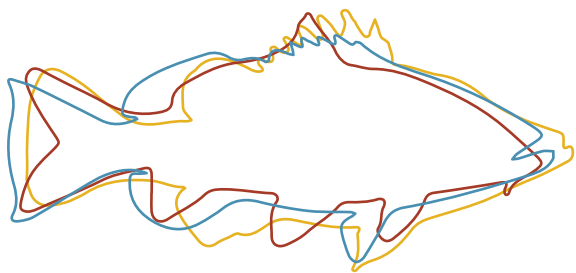
F. Control and communication

- Presents the management structure for the RCC to show who is in what role, and which roles have the authority to authorise taskings and activities.
- Shows how the designated area of responsibility could be divided into management units (sectors and divisions). Details for FCPs should also be included here.
- May also include information on pathways and details for communication within the RCC, FCPs and field roles.

G. Safety

- Safety and health systems and measures specific to regional control must be clearly defined.
- All personnel and staff should be fully informed and have ready access to the part of the system that is relevant to their role.

END



NATIONAL CARP CONTROL PLAN

The National Carp Control Plan is managed by the
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