



**Wildlife Health**  
Australia

26 June 2019

Antimicrobial Resistance Section  
Health Protection Policy Branch | Office of Health Protection  
Australian Government Department of Health

Dear Sir or Madam,

**WILDLIFE HEALTH AUSTRALIA (WHA) SUBMISSION: AUSTRALIA'S ANTIMICROBIAL RESISTANCE STRATEGY – 2020 AND BEYOND CONSULTATION PAPER**

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Please find attached a submission regarding native wildlife, antimicrobial resistance (AMR) and Australia's Antimicrobial Resistance Strategy (the Strategy) – 2020 and beyond Consultation Paper.

It is truly remarkable the overall progress that has been made in this area, and those responsible need to be congratulated. It is also extremely encouraging to see feedback being received by ASTAG and the intent of the Consultation Paper emphasising the need to include consideration of environment and wildlife in future strategies. The environment forms another compartment that could play a role in AMR, and although its significance in relation to AMR development and transmission is not well understood, we hope that the AMR Team will act on this feedback and continue to progress inclusion of this important area utilising a One Health approach. **For wildlife, it is our view that the next phase of the strategy needs to focus on national coordination and linkage to ensure that line of sight is provided from the wildlife compartment to decision and policy makers.** This will ensure that the wildlife space aligns with, and can contribute to, progression of national priorities and delivery of the future Strategy.

There are a number of areas where WHA could help and we are happy to discuss this submission with you face to face should you feel it would assist. Thank you for the opportunity to comment and good luck with this important work.

Best Wishes,

Rupert Woods AM  
CEO, WHA

## WILDLIFE HEALTH AUSTRALIA (WHA) SUBMISSION: AUSTRALIA'S ANTIMICROBIAL RESISTANCE STRATEGY – 2020 AND BEYOND CONSULTATION PAPER – QUESTIONS FOR CONSIDERATION

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We address the questions for consideration in the order in which they appear in the Consultation Paper and focus on our area of expertise: wildlife health. Additional information regarding wildlife, environment, AMR and WHA's possible future role are presented in attachment 1.

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**1. Are there other focus areas beyond environment, food and other antimicrobials which should also be included in the next Strategy?**

Not that we can think of. It is very encouraging to see the inclusion of environment in the thinking of ASTAG and the AMR Team.

**2. Do you agree with the overarching framework considered by ASTAG (Figure 1)? Please explain your answer.**

Yes. This is an excellent framework. AMR is an extraordinarily complex area. The proposed framework is simple, clear and logical and conceptualises what is important really well. Its value is that it can be immediately understood by stakeholders, uses plain English and will be a very good outreach and communication tool (a "Plan on a page"). As activities become more and more complex this schematic will act as a way of bringing all parties back to understanding what is important and where they, and these various activities fit in: great work.

**3. How do we best incorporate environment into the next AMR Strategy, which will extend over the next 20 years?**

For incorporation of wildlife, the two most important things that can be done are to ensure that we have:

- a. Formal linkage with ASTAG and;
- b. national coordination of wildlife activities.

**4. What are the current challenges to incorporate the environment into the next Strategy?**

The main challenge for incorporation of wildlife is the lack of national coordination of wildlife activities and linkage with ASTAG.

**5. Are you aware of any organisations or experts that would be relevant to AMR and the environment context?**

Yes, for the wildlife component. Wildlife Health Australia supports Australian governments and others in providing linkage and national coordination of wildlife health activities involving non-government stakeholders

(<https://www.wildlifehealthaustralia.com.au/Home.aspx>). We maintain a watching brief on AMR and Australian wildlife and track the activities and outputs of those wildlife health researchers with an interest in this area. About Wildlife Health Australia and where it might assist are presented in attachment 1.

## 6. What do you consider the priority areas for action in relation to AMR and the environment?

For wildlife the priority areas are linkage and coordination into the bigger animal and human health systems. This can be addressed by:

- a. formal linkage and or representation on ASTAG, and;
- b. national coordination of activities for the space.

Other priority activities include:

- c. The formation of a small focus group to provide input on wildlife to ASTAG, keep key people in touch and aligned with priority outputs required, and work through and progress priorities and opportunities to align with and support the Strategy.
- d. The overall approach for wildlife should be one of integration i.e. not to set up a separate system for wildlife but to integrate consideration of wildlife and environment across the objectives and areas of the Strategy. The focus should be determining the role (if any) of wildlife in risk management for human health and trade and market access.

The main area where wildlife could possibly contribute in risk management is around surveillance, use of wildlife as sentinels, and provision of information and intelligence from the field.

The over goal should be to determine what's there (what sort of resistance)? Why is it there? Where is it going? What is the role of wildlife, the implications (so what/should we be concerned?), and, what, if anything should we be doing about it?

- e. A focus on a number of questions could help:
  - i. What's important for AMR and wildlife?

There are four interrelated areas:

- ii. Understanding the ecology of resistant bacteria in wildlife (are there key species we should worry about?)
- iii. Impacts to the wildlife host / environment (how are we driving AMR in wildlife?)
- iv. Understanding human and agricultural risk from environmental cycling (wildlife to humans and agricultural areas). This is dependent on understanding environmental cycling and wildlife's part in that
- v. Education and stewardship of wildlife carers (immediate management of one group of risk producers).

**7. Are there any existing programs/projects/policies that could provide an ‘entry point’ for deeper environmental impact?**

For wildlife yes. In 2002 the Australian government initiated the formation of Wildlife Health Australia, the national coordinating body for wildlife health in Australia. Core business is wildlife health surveillance to support trade, human health and biodiversity. Wildlife Health Australia maintains the national database of wildlife health information, eWHIS, and captures information *ad hoc* on AMR in wildlife. Wildlife Health Australia also maintains a watching brief on AMR activities for the wildlife space. Wildlife Health Australia’s strength is its One Health focus and ability to engage and access information and intelligence from multiple stakeholder groups across government and non-government. Many of the non-government stakeholders may have information that is of importance to government but that might not normally flow through the usual government reporting channels. Expansion of Wildlife Health Australia’s brief to include a formal role in coordination and provision of information and intelligence to ASTAG and the AMR Team would be a logical way to better utilise this structure to help. See attachment 1 for more information.

**8. Does the Vision remain appropriate for the next longer-term Strategy?**

Yes.

**9. Is a Vision and a Goal still required? If both are required, does the Goal remain appropriate, or if not, what are your suggestions for a revised goal?**

Yes, and yes. A vision unites: a goal gives us something more specific to measure against.

**10. What does success look like for Australia in responding to the threat of AMR?**

For the wildlife component:

- A representative on ASTAG
- National coordination and linkage to provide ASTAG, our ACVO, CMO, CEBO and the AMR Team line of sight to this compartment
- An agreed framework and process for capture and the rapid and timely reporting and provision of information and intelligence generated on wildlife health and AMR to ASTAG, the AMT Team, ACVO, CMO and other stakeholders and decision makers
- Research and surveillance priorities identified, agreed, actioned and coordinated.

## Questions 11 – 13: Regarding the Strategy objectives:

**Objective One: Increase awareness and understanding of antimicrobial resistance, its implications and actions to combat it, through effective communication, education and training.**

### Questions for Consideration

For wildlife:

- For your organisation/sector, please describe your achievements, challenges and what you see as your next steps.
  - **Production of a fact sheet on AMR and wildlife** which has been circulated to our 700 individual members and 80 or so organisations that we work with as well as our focus groups as well as being made publicly available on our website ([https://wildlifehealthaustralia.com.au/Portals/0/Documents/FactSheets/Multiple\\_groups/Antimicrobial\\_Resistance\\_and\\_Australian\\_Wildlife.pdf](https://wildlifehealthaustralia.com.au/Portals/0/Documents/FactSheets/Multiple_groups/Antimicrobial_Resistance_and_Australian_Wildlife.pdf)). This sheet is updated as new information becomes available.
  - Inclusion of AMR and considerations for use of antimicrobial agents in wildlife in a **national set of wildlife biosecurity guidelines** which have also been circulated to our members as well as key wildlife carer groups ([https://wildlifehealthaustralia.com.au/Portals/0/Documents/ProgramProjects/National\\_Wildlife\\_Biosecurity\\_Guidelines.PDF](https://wildlifehealthaustralia.com.au/Portals/0/Documents/ProgramProjects/National_Wildlife_Biosecurity_Guidelines.PDF)). We have also been attending conferences to make frontline wildlife people aware of these guidelines e.g. veterinarians, zoologists, biologists.

Our main challenge is trying to fit this in along with all the other things that are asked of us. We are currently reviewing our activities for the future. A useful next step for us would be to commence discussions with the AMR Team about the role of our organisation in assisting and how this might be facilitated for the wildlife space.

- Is the objective still appropriate for Australia's next AMR Strategy for 2020 and beyond?

Yes.

- Are the current Priority Areas for Action under each Objective still relevant for 2020 and beyond?

Yes.

**Objective Two: Implement effective antimicrobial stewardship practices across human health and animal care settings to ensure the appropriate and judicious prescribing, dispensing and administering of antimicrobials**

For wildlife:

- For your organisation/sector, please describe your achievements, challenges and what you see as your next steps.

Where possible we have attempted to ensure that the information we produce cross-references and is consistent with the current Strategy (Fact sheet, Biosecurity Guidelines - Above).

A useful next step for wildlife and our area would be to work with the Australian Veterinary Association in targeting wildlife carers and veterinarians who see wildlife and use antibiotics in their practices to facilitate appropriate stewardship.

- Is the objective still appropriate for Australia's next AMR Strategy for 2020 and beyond?

Yes.

- Are the current Priority Areas for Action under each Objective still relevant for 2020 and beyond? If not, what else would you include?

Yes.

### **Objective Three: Develop nationally coordinated One Health surveillance of antimicrobial resistance and antimicrobial usage.**

For wildlife:

- For your organisation/sector, please describe your achievements, challenges and what you see as your next steps.

We have commenced capture of information on AMR in the National Wildlife Health Information System, eWHIS. The main challenge is our inability to devote more time and resources to anything other than *ad hoc* capture and reporting. The next step would be to seek resources to enable an assessment of the ability of the system to be modified to suit the needs of the Strategy for data capture and make these changes to the database should this be required. Targeted surveillance may be a long way off, but an agreement on fields and alignment of the national database with Strategy needs would at the least allow what data are captured to be better held for if and when they might be needed.

Seeking resources to facilitate provision of data by stakeholders to the national system, collation and reporting, would also be a useful next step.

- Is the objective still appropriate for Australia's next AMR Strategy for 2020 and beyond?

Yes

- Are the current Priority Areas for Action under each Objective still relevant for 2020 and beyond?

Yes

**Objective Four: Improve infection prevention and control measures across human health and animal care settings to help prevent infections and the spread of resistance.**

For wildlife:

- For your organisation/sector, please describe your achievements, challenges and what you see as your next steps.

A challenge in the wildlife space is the off-label use of antimicrobials. This is an issue best addressed through our stewardship objectives (above). Wildlife carers, and front-line wildlife health works are important groups for us.

- Is the objective still appropriate for Australia's next AMR Strategy for 2020 and beyond? If not, how would you refine it? Please consider the ASTAG consultation outcomes in your answer.

Yes

- Are the current Priority Areas for Action under each Objective still relevant for 2020 and beyond? If not, what else would you include?

Yes. It is encouraging to see the intention to include wildlife hospitals as part of possible future accreditation to ensure best practice IPC is implemented. We would strongly support this inclusion. Wildlife Health Australia could assist if resourced to do so.

**Objective Five: Agree a national research agenda and promote investment in the discovery and development of new products and approaches to prevent, detect and contain antimicrobial resistance.**

For wildlife:

- For your organisation/sector, please describe your achievements, challenges and what you see as your next steps.

A challenge for wildlife is our inability to coordinate national research activities and the sharing of information on AMR. National coordination of wildlife health activities is, however, resource intensive. A useful next step would be to recognise the value that increased engagement with the wildlife space would bring, support investment in coordination and bringing this area into the system. The immediate goal should be to integrate wildlife into national research priorities and develop an agenda that supports the Strategy. One potential approach has been presented above (6). The overall objective is to determine what role, if any, wildlife play in AMR, what might be the opportunity and what should be done about this. Other activities involving wildlife do not need to stop and it is important that a logical and considered approach is applied to the research area. (See also 6 above.)

- Is the objective still appropriate for Australia's next AMR Strategy for 2020 and beyond? If not, how would you refine it?

Yes.

- Are the current Priority Areas for Action under each Objective still relevant for 2020 and beyond?

Yes.

**Objective Six: Strengthen international partnerships and collaboration on regional and global efforts to respond to antimicrobial resistance.**

For wildlife:

- For your organisation/sector, please describe your achievements, challenges and what you see as your next steps.

Outputs on wildlife and AMR produced by Wildlife Health Australia (Objective 1 - above) have been shared with the OIE Working Group on Wildlife and Regional Wildlife Health Focal Points informed of their production and availability. Wildlife Health Australia meets regularly and informally with our counterparts in QADS member countries to discuss issues of mutual interest for wildlife. We have little influence over individual member countries activities; however, we could bring a suggestion to the OIE Working Group on Wildlife to include AMR awareness into the next cycle of Focal Point training should our National Focal Point consider this to be useful. The National Biosecurity Guidelines could be re-badged and distributed to OIE member countries to support biosecurity and appropriate use of antimicrobials in wildlife.

- Is the objective still appropriate for Australia's next AMR Strategy for 2020 and beyond? If not, how would you refine it?

Yes.

- Are the current Priority Areas for Action under each Objective still relevant for 2020 and beyond?

Yes.

**Objective Seven: Establish and support clear governance arrangements at the local, jurisdictional, national and international levels to ensure leadership, engagement and accountability for actions to combat antimicrobial resistance.**

For wildlife:

- For your organisation/sector, please describe your achievements, challenges and what you see as your next steps.

Unfortunately, though well positioned to do so, we have very few resources to dedicate to this area of the strategy. Should resourcing become available, a small focus group could be set up to coordinate and progress these types of activities for the wildlife space. In the meantime, we will continue to maintain contact and support as best we can those responsible for the Strategy in the animal health area.

- Is the objective still appropriate for Australia's next AMR Strategy for 2020 and beyond?

Yes.

- Are the current Priority Areas for Action under each Objective still relevant for 2020 and beyond?

Yes.

**14. Are there other sectors that need to be considered as part of the next strategy?**

Not that we can think of. The area is so large and complex and with limited resources, we need to be careful that we do not disproportionately focus on small areas to the detriment of the sectors and big-ticket items that will give us best return on our investment.

**15. What do you see as your sector's role and responsibilities in Australia's response to AMR?**

As the coordinating body for wildlife health in Australia, we feel we have a responsibility to lead this area for our sector. We are very well placed to do this, however, we have few resources which hampers our ability to contribute. We will continue to try to help where we can.

## **1. Stocktake of Activities**

Only activities carried out directly by Wildlife Health Australia are included below. We maintain a log of other activities in our space that can be provided if required.

<b>Objective 1: Increase awareness and understanding of antimicrobial resistance, its implications and actions to combat it, through effective communication, education and training</b>					
<b>Activity</b>	<b>Responsibility – Lead</b>	<b>Key partners (include role)</b>	<b>Milestones</b>	<b>Expected Outcome/s</b>	<b>Links with other Strategy Objectives</b>
<i>Priority Action Area 1.1 – Strengthen consumer awareness initiatives to improve understanding of antimicrobial resistance and the importance of using antibiotics appropriately</i>					
<i>Priority Action Area 1.2 – Increase support for human and animal health professionals in reinforcing key messages with patients and clients</i>					
Production of fact sheets and incorporation of stewardship into national biosecurity guidelines	Wildlife Health Australia	Veterinarians, wildlife carers, front line wildlife workers including those in zoos, field workers and researchers - enablers		Improved understanding of risk and issues. Improved stewardship.	
<i>Priority Action Area 1.3 – Strengthen communication and education initiatives for health professionals and team members</i>					
<i>Priority Action Area 1.4 – Develop a stakeholder engagement and communication plan to support whole-of-society awareness of, and participation in, implementation of the Strategy</i>					

**Objective 2:** Implement effective antimicrobial stewardship practices across human health and animal care settings to ensure the appropriate and judicious prescribing, dispensing and administering of antimicrobials

Activity	Responsibility – Lead	Key partners (include role)	Milestones	Expected Outcome/s	Links with other Strategy Objectives
<i>Priority Action Area 2.1 - Ensure that tailored, evidence-based antibiotic prescribing guidelines are available for all sectors</i>					
<i>Priority Action Area 2.2 – Ensure the availability of evidence-based, best practice and nationally consistent approaches to AMS across human health and animal health sectors</i>					
<i>Priority Action Area 2.3 – Develop tailored, evidence-based resources to support the implementation of AMS programmes</i>					
<i>Priority Action Area 2.4 – Review existing accreditation and quality assurance programmes to ensure they appropriately support and encourage compliance with best practice AMS approaches</i>					
<i>Priority Action Area 2.5 – Strengthen existing measures to better support appropriate and judicious use of antibiotics</i>					

**Objective 3: Develop nationally coordinated One Health surveillance of antimicrobial resistance and antimicrobial usage**

Activity	Responsibility – Lead	Key partners (include role)	Milestones	Expected Outcome/s	Links with other Strategy Objectives
<i>Priority Action Area 3.1 – Establish the foundations for national One Health Surveillance</i>					
<i>Priority Action Area 3.2 – Agree the objectives of surveillance for each sector, ensuring they align with the overarching objectives for the national One Health surveillance system</i>					
<i>Priority Action Area 3.3 – Develop lists of priority organisms and associated antimicrobials for national reporting</i>					
<i>Priority Action Area 3.4 – Agree and implement a uniform standard for laboratory testing methods for resistance susceptibility</i>					
<i>Priority Action Area 3.5 – Improve human health surveillance</i>					
<i>Priority Action Area 3.6 – Improve animal health and agriculture surveillance</i>					
Ad hoc capture of information on AMR now requested from surveillance partners	Wildlife Health Australia	About 80 agencies and organisations in Australia with an interest in wildlife health. Australian government departments		Eventually we would like to see wildlife incorporated into larger surveillance efforts. Potential outputs of value to the Strategy	

**Objective 3: Develop nationally coordinated One Health surveillance of antimicrobial resistance and antimicrobial usage**

Activity	Responsibility – Lead	Key partners (include role)	Milestones	Expected Outcome/s	Links with other Strategy Objectives
		of agriculture, the Zoo and Aquarium Association, sentinel veterinary and other clinics including university veterinary schools – provision of information		include data and reports, information and intelligence and national coordination leading to better understanding of the risk posed by the space and risk management/mitigation opportunities.	
<i>Priority Action Area 3.7 - Investigate requirements for surveillance in food</i>					

<b>Objective 4: Improve infection prevention and control measures across human health and animal care settings to help prevent infections and the spread of resistance</b>					
<b>Activity</b>	<b>Responsibility – Lead</b>	<b>Key partners (include role)</b>	<b>Milestones</b>	<b>Expected Outcome/s</b>	<b>Links with other Strategy Objectives</b>
<i>Priority Action Area 4.1 – Ensure availability of evidence-based, best-practice and nationally consistent standards for IPC across human health and animal care settings</i>					
<i>Priority Action Area 4.2 - Review existing accreditation and quality assurance programmes to ensure they appropriately support and encourage compliance with best practice IPC measures</i>					
<i>Priority Action Area 4.3 - Develop additional initiatives and resources to strengthen IPC in all human health care settings</i>					
<i>Priority Action Area 4.4 - Further develop initiatives and resources to strengthen IPC in the livestock industry</i>					
<i>Priority Action Area 4.5 - Further develop resources to strengthen IPC in veterinary practice</i>					
Production of National Wildlife Biosecurity Guidelines (which includes AMR and use of antibiotics)	Wildlife Health Australia	Veterinarians, wildlife carers, front line wildlife workers including those in zoos, field workers and researchers.		These guidelines are circulated and made available to those who work with wildlife in Australia. Improved biosecurity: decreased and	4.4 above for the wildlife sector

**Objective 4: Improve infection prevention and control measures across human health and animal care settings to help prevent infections and the spread of resistance**

Activity	Responsibility – Lead	Key partners (include role)	Milestones	Expected Outcome/s	Links with other Strategy Objectives
				more appropriate use of antimicrobials.	
<i>Priority Action Area 4.6 – Encourage continued increases in vaccination rates to prevent infections</i>					

**Objective 5: Agree a national research agenda and promote investment in the discovery and development of new products and approaches to prevent, detect and contain antimicrobial resistance**

Activity	Responsibility – Lead	Key partners (include role)	Milestones	Expected Outcome/s	Links with other Strategy objectives
<i>Priority Action Area 5.1 - Identify current gaps and agree national research and development priorities</i>					
Monitoring and logging activity in the wildlife space	Wildlife Health Australia	Wildlife Health Australia partner agencies and organisations and individuals. Their role is not formalised, though this would improve provision of information on their projects and priorities		Understanding of activity and key researchers in the space, which sets the foundation for better coordination of activities.	7 below
<i>Priority Action Area 5.2 – Coordinate national research activities and the sharing of information</i>					
Provision of information to DAWR and others when requested for the wildlife space	Wildlife Health Australia			Contributes to realisation of the Strategy by providing line of sight to this compartment such that we know what we know...know what we don't know...and know what we need to know.	

**Objective 5: Agree a national research agenda and promote investment in the discovery and development of new products and approaches to prevent, detect and contain antimicrobial resistance**

Activity	Responsibility – Lead	Key partners (include role)	Milestones	Expected Outcome/s	Links with other Strategy objectives
<i>Priority Action Area 5.3 – Explore opportunities to increase support for research and development, including incentives for greater private sector engagement</i>					
Provision of letters of support for research work on AMR in wildlife	Wildlife Health Australia	Australian universities - Investigators		Increased generation of information and intelligence from the field.	
<i>Priority Action Area 5.4 – Explore opportunities to support the translation of promising research findings into new products, policies and approaches</i>					

**Objective 6:** Strengthen international partnerships and collaboration on regional and global efforts to respond to antimicrobial resistance

Activity	Responsibility – Lead	Key partners (include role)	Milestones	Expected Outcome/s	Links with other Strategy objectives
<i>Priority Action Area 6.1 – Active engagement with multilateral organisations and relevant forums to contribute to global action on antimicrobial resistance</i>					
Provision of updates on activities in Australian wildlife to the international wildlife community	Wildlife Health Australia	OIE Working Group on Wildlife OIE Regional Focal Points		Increased profile for Australia and its efforts with AMR within the global wildlife health community and increased profile for AMR in wildlife. Action.	
<i>Priority Action Area 6.2 – Lead regional initiatives to increase capacity to respond to antimicrobial resistance</i>					
<i>Priority Action Area 6.3 – Learn from international best practice</i>					
<i>Priority Action Area 6.4 – Participate in international surveillance initiatives</i>					
<i>Priority Action Area 6.5 – Establish closer ties with international collaborations to link Australia’s national research agenda with what is happening internationally</i>					

**Objective 6: Strengthen international partnerships and collaboration on regional and global efforts to respond to antimicrobial resistance**

Activity	Responsibility – Lead	Key partners (include role)	Milestones	Expected Outcome/s	Links with other Strategy objectives

**Objective 7: Establish and support clear governance arrangements at the local, jurisdictional, national and international levels to ensure leadership, engagement and accountability for actions to combat antimicrobial resistance**

Activity	Responsibility – Lead	Key partners (include role)	Milestones	Expected Outcome/s	Links with other Strategy objectives
<i>Priority Action Area 7.1 – Identify, establish and maintain linkages between implementation partners across all sectors</i>					
Monitoring and logging activity in the wildlife space	Wildlife Health Australia	Wildlife Health Australia partner agencies and organisations and individuals. Their role is not formalised, though this would improve provision of information on their projects and priorities		Understanding of activity and key researchers in the space, which sets the foundation for better coordination of activities.	5

**Objective 7: Establish and support clear governance arrangements at the local, jurisdictional, national and international levels to ensure leadership, engagement and accountability for actions to combat antimicrobial resistance**

Activity	Responsibility – Lead	Key partners (include role)	Milestones	Expected Outcome/s	Links with other Strategy objectives
<i>Priority Action Area 7.2 – Work with stakeholders to develop an Implementation Plan for the Strategy</i>					
Discussion with key wildlife stakeholders on how resources might be found to assist	Wildlife Health Australia	Australian universities		Better understanding, coordination and focus on priority areas as identified in the Strategy. Improved feedback from stakeholders into the Strategy.	
<i>Priority Action Area 7.3 – Establish baseline measures to inform monitoring and evaluation of the Strategy</i>					
<i>Priority Action Area 7.4 – Review regulation (legislated and other) relevant to antimicrobial resistance and antibiotic usage</i>					

## ATTACHMENT 1 – ADDITIONAL INFORMATION ON AMR, WILDLIFE AND HOW WILDLIFE HEALTH AUSTRALIA COULD HELP

### CURRENT KNOWLEDGE - ANTIMICROBIAL RESISTANCE, WILDLIFE AND PRODUCTION ANIMALS

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Radhouani et al (2014) refer to AMR as an “ecological problem”, demonstrating that wildlife can act as an environmental reservoir and also a “melting pot” for bacterial resistance. The existence of AMR in a range of wildlife species is well documented overseas, and in a limited number of published cases in Australia (e.g. Sherley et al, 2000; Chen et al, 2014). A scoping review of published research evaluated the role of wildlife in transmission of AMR to the food chain and found that 309 of 866 relevant primary research articles reported AMR in wildlife, with AMR transmission reported in 110 (Greig et al, 2014). Reported risk factors for transmission of AMR/bacteria from wildlife to food animals, environmental sources or humans included presence of wild birds, shared range, and contamination of water by wildlife.

Studies in Australia found “a low but widespread prevalence of anti-microbial resistance” in an analysis of 946 strains of Enterobacteriaceae isolates from wild Australian mammals from 1993-1997 (Sherley et al, 2000). The isolates came from 77 species (14 families) collected from all jurisdictions of Australia. Chen et al (2014) found wallabies in a pristine environment and in a captive zoo situation in South Australia to be a significant reservoir of antibiotic resistance in a number of *Staphylococcus* species, with resistance to  $\beta$ -lactam antimicrobials in around a third of all isolates. Interestingly, multi-drug resistant staphylococci were found in free-ranging wallabies in a remote area without significant contact with humans or prior exposure to antibiotics. This finding is consistent with other studies, indicating the complex dynamics of AMR spread among wild populations (Radhouani et al, 2014).

As explained by Sherley et al (2000): “The prevalence of antibiotic resistance in environmental strains may be influenced by human antibiotic use in several ways: through the spread of resistant strains or their genes from human and agricultural systems, the evolution and selection of new resistant strains or the amplification of pre-existing resistant strains in the environment.” Wellington et al (2013) describe the reservoir of antibiotic resistance genes in the environment as a mix of naturally occurring resistance, those present in animal and human waste, and the selective effects of pollutants. Transfer of AMR between wildlife and humans and/or domestic animals could potentially occur through environmental contamination with human/animal waste, particularly in water.

As well as a potential environmental AMR reservoir to humans and domestic animals, the impact of AMR environmental contamination from treatment of livestock (Barton, 2012) should also be considered. The environment may be contaminated by veterinary antimicrobials via treatment of livestock on pasture or following application of manure from intensive livestock production. These may be cycled and re-cycled through soil, ground water, marine water, wild animals, crops, shellfish and livestock (Wellington et al, 2013).

Power et al (2013) also reported on the risk of introduction of AMR into the environment through species recovery programs, with integrons associated with clinical AMR found in 48% of faecal samples of brush-tailed rock-wallabies (*Petrogale penicillata*) in a captive breeding program, which were later released. Free-ranging wildlife populations have the potential to act as sentinels for environmental contamination and can therefore be a useful target for a surveillance program.

## THE IMPORTANCE OF CONSIDERING WILDLIFE AND THE ENVIRONMENT IN THE STRATEGY

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The potential role of environmental contamination in the transfer of AMR between wildlife, domestic animals and humans has been recognised (above and Greig et al, 2014; Guenther S et al, 2011; Radhouani et al, 2014; Wellington et al, 2013). Wildlife populations have the potential to act as reservoirs for antimicrobial resistance, however the dynamics of this process and the magnitude of the risk to agriculture is poorly understood.

Emerging pathogens from wildlife are growing in significance as free-ranging wildlife populations become increasingly urbanised, resulting in greater overlap of usage of the environment, and closer direct and indirect contact with humans and domestic animals. There may be a similar effect in relation to AMR.

## WILDLIFE PRIORITIES FOR AMR AND PRODUCTION ANIMALS

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For Wildlife, the priority is research to better understand how resistant bacteria move between wildlife, the environment, food producing animals (and humans) and the relative importance of these groups in the maintenance and dispersal of AMR. Surveillance and research for the production animal sector could include:

- investigation of the extent of AMR within the Australian free-ranging wildlife population, the environment and interaction and impact upon domestic animals
- usage of antimicrobials for the treatment of wildlife cases presenting to zoo hospitals, wildlife rehabilitation centres and private veterinary clinics and their impact upon AMR and its transmission to domestic animals and the environment.

An important question is whether surveillance is required in wild animal populations, what this might look like and whether the value proposition holds (i.e. that this would assist in identifying, articulating and managing the overall risk to production animals and people).

## REGARDING THE CONTRIBUTION THAT WHA MAY MAKE TO THE STRATEGY

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WHA coordinates a number of national wildlife disease surveillance programs, including the General Wildlife Disease Surveillance Program, the Zoo Based Wildlife Disease Surveillance Program, and the Sentinel Clinic Wildlife Disease Surveillance Program. WHA also coordinates a national Universities Focus Group, which represents universities conducting research in diseases of wildlife, a Bat Health Focus Group and a Zoo Animal Health Reference Group. WHA-coordinated surveillance programs operate at a national level, providing a link between organisations at a local and jurisdictional level, and between government and non-government organisations.

Wildlife health data captured through the surveillance programs coordinated by WHA are managed through a national web-based database known as eWHIS (the 'electronic Wildlife Health Information System'). The data in eWHIS are available to inform policy and management decisions by relevant authorities, for international reporting, and to protect Australia's trade, human health, livestock health and biodiversity. The surveillance programs and eWHIS database have the capacity to capture national data on the occurrence of AMR in free-ranging wildlife. Several cases of multi-resistant bacterial infections in free-ranging wildlife have already been reported through the Zoo Based Wildlife Disease Surveillance Program. This has prompted WHA to recognise the need to raise awareness of AMR in free-ranging animals and encourage further reporting.

WHA is the coordinating body for wildlife health in Australia and networks with a wide range of stakeholders including representatives from federal, state and territory conservation, agriculture and human health agencies and industries, wildlife health professionals, universities, zoos, private practitioners, wildlife carer groups, hunters and fishers, and diagnostic pathology services. WHA primarily does this through expert focus groups, surveillance programs, and a weekly email Digest that reaches over 750 subscribers with an interest in wildlife health. Establishing linkages with WHA and associated groups and stakeholders may assist in expanding the scope of the Strategy to address AMR issues associated with wildlife and the environment should the writing group chose to do so.

The current focus of WHA activities is in supporting biosecurity agencies in their efforts to better manage the adverse impacts of diseases with wildlife as part of their epidemiology on Australia's agricultural systems and production animals. For WHA to better support AMR activities, however, the input, resourcing and guidance of Health and Environment would be required.

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## ABOUT WILDLIFE HEALTH AUSTRALIA

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Wildlife Health Australia (WHA) is the coordinating body for wildlife health in Australia and operates nationally. The head office is located in Sydney, NSW.

WHA activities focus on the increasing risk of emergency and emerging diseases that can spill over from wild animals and impact on Australia's trade, human health, biodiversity and tourism. We provide a framework that allows Australia to better identify, assess, articulate and manage these risks. We provide the framework for Australia's general wildlife health surveillance system.

Our mission is to develop strong partnerships in order to better manage the adverse effects of wildlife diseases on Australia's animal health industries, human health, biodiversity, trade and tourism.

WHA directly supports the Animal Health Committee (AHC), Environment and Invasives Committee (EIC), Animal Health Australia (AHA), the Animal Health Policy Branch and the Office of the Chief Veterinary Officer (OCVO) and Chief Environmental Biosecurity Officer (CEBO) within the Australian Government Department of Agriculture and Water Resources (DAWR) and Australian governments in their efforts to better prepare and protect Australia against the adverse effects of wildlife diseases. It provides priorities in wildlife disease work, administers Australia's general wildlife disease surveillance system as well as facilitating and coordinating targeted projects. Wildlife health intelligence collected through the National Wildlife Health Information System (eWHIS: <http://www.wildlifehealthaustralia.com.au>) administered by WHA is provided to members of AHC and the Australian Government DAWR, and Departments of Health (DoH) and Environment and Energy (DoEE), on issues of potential national interest, potential emerging issues and significant disease outbreaks in wildlife. The information is provided in line with the agreed policy for data security. WHA supports the National Animal Health Information System (NAHIS) by provision of quarterly reporting and the Australian Chief Veterinary Officer by hosting the World Organization for Animal Health (OIE) Wildlife Health Focal Point. WHA also provides Australia's representative to the International Union for the Conservation of Nature Species Survival Commission Wildlife Health Specialist Group (IUCN SSC WHSG).

WHA is administered under good corporate governance principles. An elected management group, chaired by an appointment from DAWR, and including an AHC representative provides strategic direction and advice to a small team, which oversees the running of WHA. It is important to note that WHA involves almost every agency or organisation (both government and NGO) that has a stake or interest in animal and wildlife health issues in Australia. There are over 40 member organisations and more than 750 wildlife health professionals and others from around Australia and the rest of the world who have an interest in diseases with feral animals or wildlife as part of their ecology that may impact on Australia's trade, human health and biodiversity.

More information on WHA is available at: <http://www.wildlifehealthaustralia.com.au>.