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SUMMARY

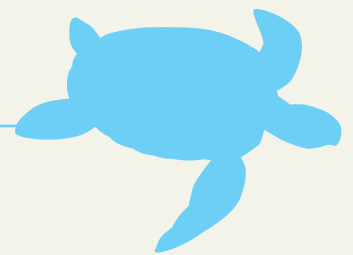
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Australia



# A Toxic Tide

## Great Barrier Reef Turtles at Risk from Human Pollutants

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*In June 2012, more than 100 green turtles washed up dead or dying in Upstart Bay, on the northern Great Barrier Reef (GBR). The world was in shock. Some of these seemingly well-nourished turtles were apparently suffering nerve damage. A few more turtles showing similar symptoms then followed in 2013 and 2014, with no known cause found.*

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One theory proposed at the time was that the turtles had been exposed to toxic chemicals from run-off. To understand if chemicals were posing a risk to the lives of our precious green sea turtles, the River-to-Reef-to-Turtle (RRT) project was born.

Partners in WWF-Australia's RRT project have spent the past four years studying what chemical pollutants exist on the GBR and what health impacts they have on wildlife, using green turtles as a case study.

Despite efforts by various state and federal governments to improve poor water quality, the health effects observed in coastal turtles have, for the first time, provided a (tentative) link between adverse water quality and the health of one of the iconic animals of the GBR ecosystem.

35 rivers covering 424,000 sq km flow into the GBR, transporting sediment, nutrients and chemicals from farming and urban activities. Poor water quality, caused by these land-based activities, is considered the second biggest threat to the health of the Great Barrier Reef and its corals after climate change. However, very

little is known about the impacts that pollutants have on the Reef's beautiful and important wildlife.

Green turtles have been proven to be good 'indicators' of the quality or health of the Reef. During the study WWF-Australia and its partners tested chemical contaminants and the effects they were having on green turtles in coastal areas. The GBR's water, sediment, seagrass, turtle blood and shell were all tested at the same time at three different sites. These results were integrated to test whether land-based contaminants adversely impacted the health of resident green turtle populations, and if symptoms seen at the mass stranding in Upstart Bay turtles were due to severe exposure to contaminants.

Scientists used revolutionary new ways to quantify which chemicals were present and how chemicals are having a negative health effect on green turtles. In an Australian first, scientists developed new experimental methods, including growing green turtle skin cells to test how chemicals washing into the Great Barrier Reef are impacting these protected species.



## To help protect our GBR and turtles from the impacts of poor water quality, WWF-Australia and its partners recommend:

### Recommendation 1

Chemical contaminants should be rapidly assessed in all major bays and estuaries of the GBR, using the new methods and technologies developed, to help identify 'hotspots' and prioritise action and investment;

### Recommendation 2

A wider range of contaminants (including metals) should be included in routine monitoring of the GBR environment, to address the emerging issue of chemical contamination and health impacts;

### Recommendation 3

Turtle health biomonitoring should be included in routine monitoring of GBR wildlife to further understand the hazard, exposure and risk posed by specific contaminants on the turtles future health, reproduction and survival, and be developed as an indicator (or tool) to detect future environmental chemical change, and;

### Recommendation 4

Investing in land, riverine and wetland restoration for those bays and estuaries identified as a major sources of chemical pollution.



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*“The RRT focused on developing new methodologies, tools and approaches to test the links between water quality and green turtle health”* – Christine Madden Hof, Marine Species Project Manager.

Thanks to these innovative methods and the RRT project, scientists have been able to prove that poor water quality is negatively impacting the health of Australia’s iconic green sea turtle.

The RRT study found that (coastal) green turtles close to urban, industrial and agricultural activities showed signs of poorer health than turtles found in more remote areas. Coastal turtles were inclined to have a higher white blood cell count, inflammation and liver disease, (benign) tumours on their skin, and eye lesions.

Marine turtles have roamed the world’s oceans for more than 100 million years and are an integral part of our Reef. But sadly, combined with the other threats

they face, the odds are now stacked against them.

Thanks to this research we now know a lot more than we did about the effects of pollution on the GBR and its marine wildlife. The RRT project highlights that we may be missing a crucial piece of the puzzle

- the sheer number and type of chemicals that are contaminating our GBR. We need to ensure we act upon these findings by expanding our scope of water quality and wildlife monitoring, invest in priority catchment restoration and rehabilitation, and tighten our controls on water pollution.

We’re calling on government to enforce laws to stop outdated high polluting practices, and overhaul its current monitoring approach to

reduce the cocktail of chemicals entering the GBR, so the Reef and turtles get the clean water, good food, and the healthy home they need.

**“Turtles need clean water, good food and a healthy home to thrive.”**

Christine Madden Hof, Marine Species Project Manager

**Acknowledgements:** We are grateful to the Rivers to Reef to Turtles project partners for their dedication to this project and acknowledge the contributions made. We also thank the partners and volunteers for field work support. For further information visit: [www.wwf.org.au/RRT](http://www.wwf.org.au/RRT)