Buffalo fly: an increasing biosecurity risk under a changing climate

A warmer climate is likely to increase the occurrence and extend the distribution of buffalo flies in some areas of NSW. This poses threats to the State's beef and dairy industries.

Developing industry-informed climate planning information

Climate change is altering the biosecurity risks for many agricultural commodities across NSW. Primary producers need evidence-based information about the changing climate, and the risks and opportunities it may bring.

Through its Vulnerability Assessment Project, the NSW Department of Primary Industries is increasing the resilience of our primary industries by providing information and data to help the sector better plan for, and respond to, climate change. The project has determined climate change impacts for extensive livestock, broadacre cropping, marine fisheries, forestry, horticulture and viticulture, and important cross-cutting biosecurity risks to inform sound planning, risk management and adaptation decisions.

Buffalo fly in NSW

Buffalo fly (*Haematobia exigua*) is an introduced small biting parasitic fly that primarily affects cattle and buffalo. The flies occur mainly in northern Australia, including north-eastern NSW.

Buffalo flies cost the Australian beef cattle industry an estimated $99 million annually[1]. Adult flies live on cattle and feed on their blood by lacerating the skin. The flies can feed up to 40 times a day, causing irritation, allergies and sores that can reduce the productivity of heavily infested cattle.

Buffalo flies are endemic (occur permanently) in the northeast of NSW (Figure 1, yellow area). In these areas, the flies are an ever-present pest, especially from November to April when their numbers swell due to warmer weather.

In winter, the flies survive in low numbers in sheltered, moist and hilly areas that are less likely to be affected by frost.

During spring and summer, fly numbers increase and they spread from the endemic regions. Buffalo flies only occur in the seasonal regions (Figure 1, grey area) in some months and years, depending on weather conditions. During the wet years of 2010–11, buffalo flies occurred as far south as Maitland and as far west as Bourke.

[1] Lane J, Jubb T, Shephard R, Webb-Ware J and Fordyce G. (2015) Priority list of endemic diseases for the red meat industries. Project Report. Meat & Livestock Australia Limited.

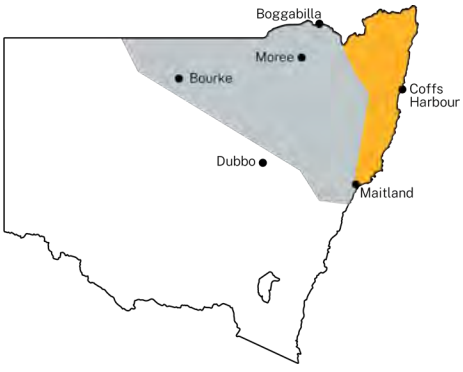

Figure 1. Endemic (yellow) and seasonal (grey) distribution of buffalo flies across NSW. Bourke, Dubbo and Maitland represent the edges of the seasonal distribution.

Climate and buffalo flies

Overall, the impacts of buffalo fly in NSW are projected to increase in autumn, spring and winter in 2050. Changes in climate suitability are likely to occur across the egg, larvae and pupae stages of the life cycle.

Climate risks likely to increase the occurrence and distribution of buffalo flies include:

Warmer temperatures and **fewer frosts** will reduce the dieback of flies during colder months, increasing their occurrence and allowing them to spread further.

Climate impacts: what to expect

Egg

- **Increased climate suitability** in the endemic and seasonal regions from September to May (*low to high confidence*), and from June to August for the endemic region only.
- **Maintained historical climate suitability** in the seasonal region from June to August.

Larvae

- **Increased climate suitability** in the endemic and seasonal regions from September to June (*low to high confidence*), and in July and August for the endemic region only.
- **Decreased climate suitability** in the endemic and seasonal regions from November to March (*low to high confidence*).

Pupae

- **Increased climate suitability** in the endemic and seasonal regions from September to May (*low to high confidence*) and June to August for the endemic region only.
- **Decreased climate suitability** in the endemic and seasonal regions from November to March (*low to high confidence*).

Impact on key NSW primary industries

A moderate increase in climate suitability to the south and west of the current endemic and seasonal regions for buffalo fly during the spring months may lead to a new and significant impact on the beef and dairy industries in areas not currently affected. Some breeds of cattle in the southern regions of Australia, such as *Bos taurus*, are more susceptible to buffalo fly than other breeds, such as *Bos indicus*. Production loss for dairy cattle due to buffalo fly is greater than for beef cattle, as irrigated pastures used in the dairy industry create more suitable conditions for buffalo fly.

Due to cooler temperatures in southern NSW, there are generally fewer flies than in the north. Southern cattle industries may need education on the increasing risk of buffalo fly if a warmer future facilitates a southward spread. Southern industries can utilise and benefit from the management practices used in the north of the state to manage buffalo flies.

Methodology and data

Climate projections were sourced from Climate Change in Australia's 'Application Ready Data'. This dataset is comprised of projections from an ensemble of 8 global climate models, each presenting a plausible future climate. The models differ in their projections, giving rise to uncertainty in our modelling. Low confidence in the projected changes due to differences between the models is noted in the text. Care should be taken when interpreting these results.

The Vulnerability Assessment Project is intended to highlight potential industry-or regional-level changes. Intermediate and high emissions scenarios were used in the assessments (RCP4.5 and RCP8.5), but these are not the only future scenarios possible. The inclusion of climate variables important to each biosecurity risk was based on published research, expert knowledge and data quality and availability.

FOR MORE INFORMATION

Please get in touch with vulnerability.assessment@dpi.nsw.gov.au

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