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Supplementary material for

Policy failure and conservation paralysis for the critically endangered swift parrot

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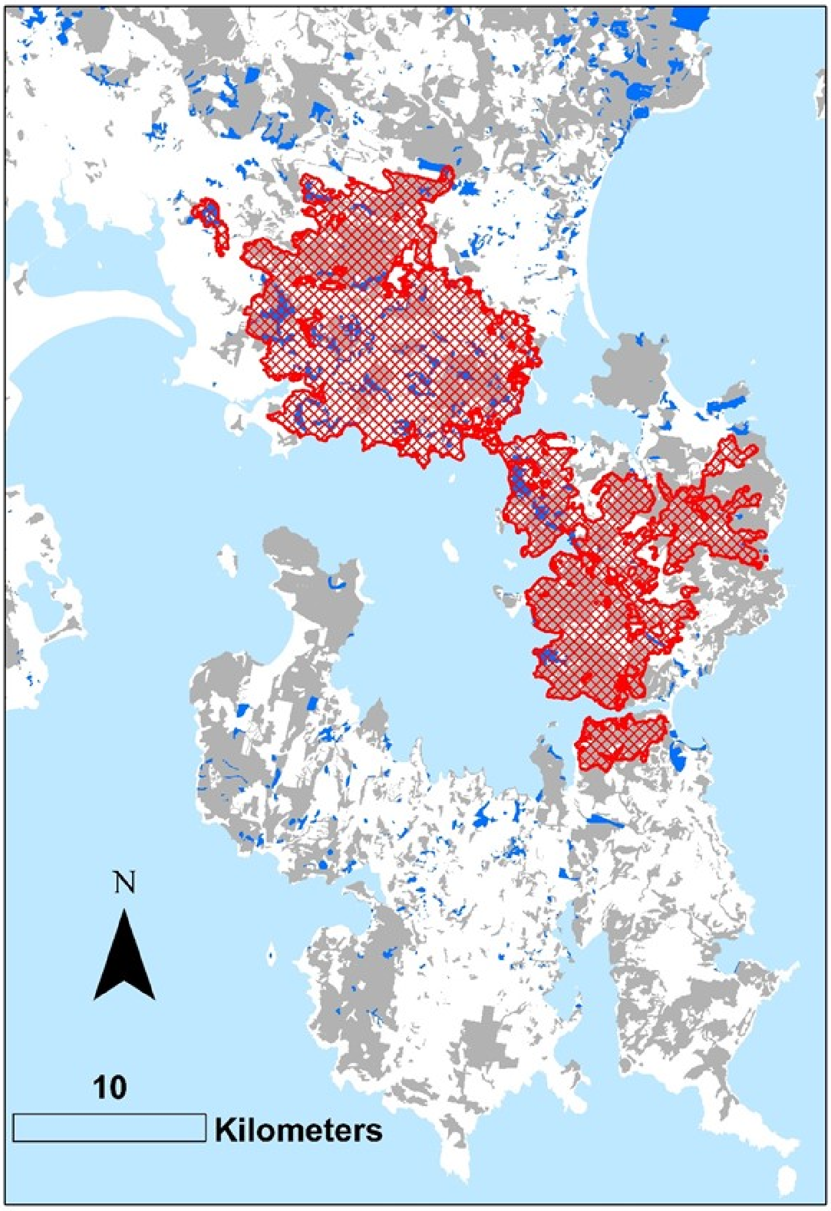

Figure S1. Extent of a large destructive wildfire in 2013 (hatched red), current mature forest they may support hollow bearing trees (grey), mapped swift parrot foraging habitat (blue). Tasmanian Fire Service. State Fire History. Available at: https://www.thelist.tas.gov.au

Text S1. Further limitations associated with identifying exact location of nest trees

In addition to the difficulties outlined in the manuscript, recording exact locations of nest trees can be problematic for several other reasons. For, example, an adult is observed landing in a forest patch, swift parrot chicks are heard being begging while being fed, then the adult flies away and the chicks are silent. This, and several other behavioural traits (e.g. copulating adults, adult female being fed by a male) identify the existence of a nest, but not the exact location (see Webb 2008; Webb *et al*. 2012; for further descriptions).

Text S2. Estimating forest loss/disturbance

We used TASVEG 3.0 to calculate the current and historical area of Eucalypt forest in the SPIBA. To quantify forest loss/disturbance we used the Global Forest Cover Change layer (Hansen *et al*. 2013) which identifies forest loss/disturbance from 2000 to 2016. Hansen *et al*. (2013) also provides a 'Forest Gain' layer which can be used to estimate loss over the preceding ~4 to 5 years. In the southern forests SPIBA, effectively all 'forest gain' is attributable to regenerating native forest or young Eucalypt plantation following clear-cut logging of native forest that occurred prior to 2001. To provide an indication of the extent of nesting habitat we used the Tasmanian RFA Forest Senescence Data Layer (Commonwealth of Australia and State of Tasmania 1996). To the best of our knowledge, this spatial layer provides the only historical information of the extent of potential 'hollow bearing' forest. Estimates of forest extent and loss were calculated using ArcMap 10.2.

Limitations of spatial data layers

The Tasmanian RFA Forest Senescence Data Layer (Commonwealth of Australia and State of Tasmania 1996) assessed tree-crown attributes using features described by Jacobs (1955) that are indicators of the presence of tree-hollows. A limitation of the layer is that some areas supporting senescent trees were not assessed including forest supporting low densities of old growth trees. Furthermore, because the layer was developed as 'the first cut' of the Tasmanian Regional Forest Agreement (RFA) Old Growth Layer. Because several types of disturbance excluded forest from being defined as 'Old Growth' under the RFA definition, some areas known to have experienced particular disturbances it may not have been assessed.

Therefore, we likely underestimate the initial extent and loss of these features in the landscape.

The Global Forest Cover Change layer captures intense wildfire (i.e. not a result of logging or land clearance), and the underlying ‘Forest Cover Layer’ from which change is measured often captures non-forest vegetation communities such as buttongrass moorlands (see far southwest Tasmania in Fig 1). These issues can be largely overcome using Tasmanian vegetation mapping (TASVEG 3.0) to identify forest communities, and inspecting the Tasmanian State Fire History (TFS 2016).

How forest loss/disturbance was estimated from the Forest Gain Layer supplied in the Global Forest Cover Change layer (Hansen et al. 2013).

The dominant land tenure in the southern forest SPIBA is public land (Figure S3), most which is state forest and logging is the dominant land use in the area. While the Global Forest Cover Change layer captures intense wildfire and other land clearance, in the Southern Forests SPIBA essentially all loss can be attributed to clear-cut logging on public land and additional forestry operations on private land. Similarly, the forest gain layer is attributable to regrowth of native forest or plantation timber following clear-cutting of native forest.

The State Fire History (TFS 2016) from 1996 to 2016 also showed little evidence of the Global Forest Cover Change layer capturing fire. This is because most fires in the southern forests SPIBA during this period were low intensity planned burns (many in buttongrass plains) or regeneration burns following clear-cut logging.

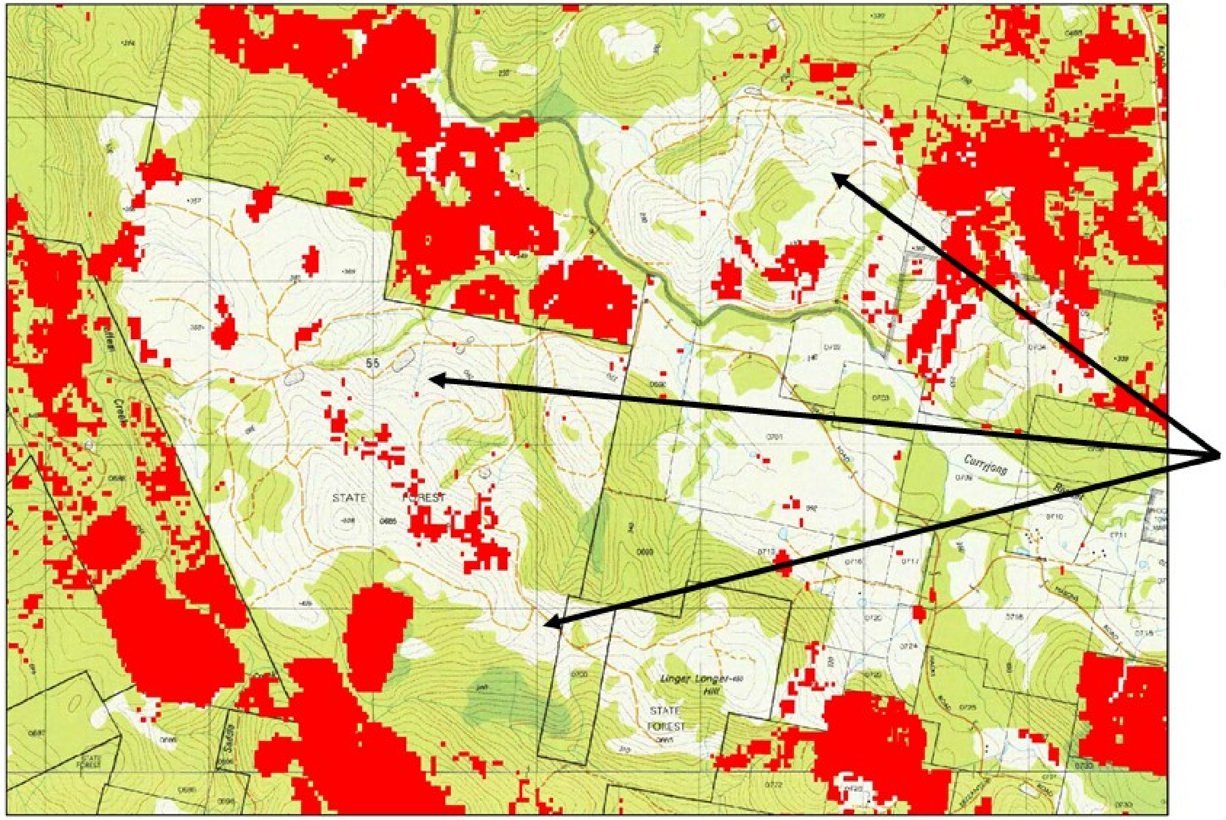

Figure S2a. Example of logging operations prior to ~1997 and not captured by the Global Forest Cover change layer – Nelson Tier region.

Red indicates Global Forest Cover change layer (Hansen et al. 2013).

White (or lighter) areas are identified as 'forestry operations' on Tasmanian 1:25,000 map sheets.

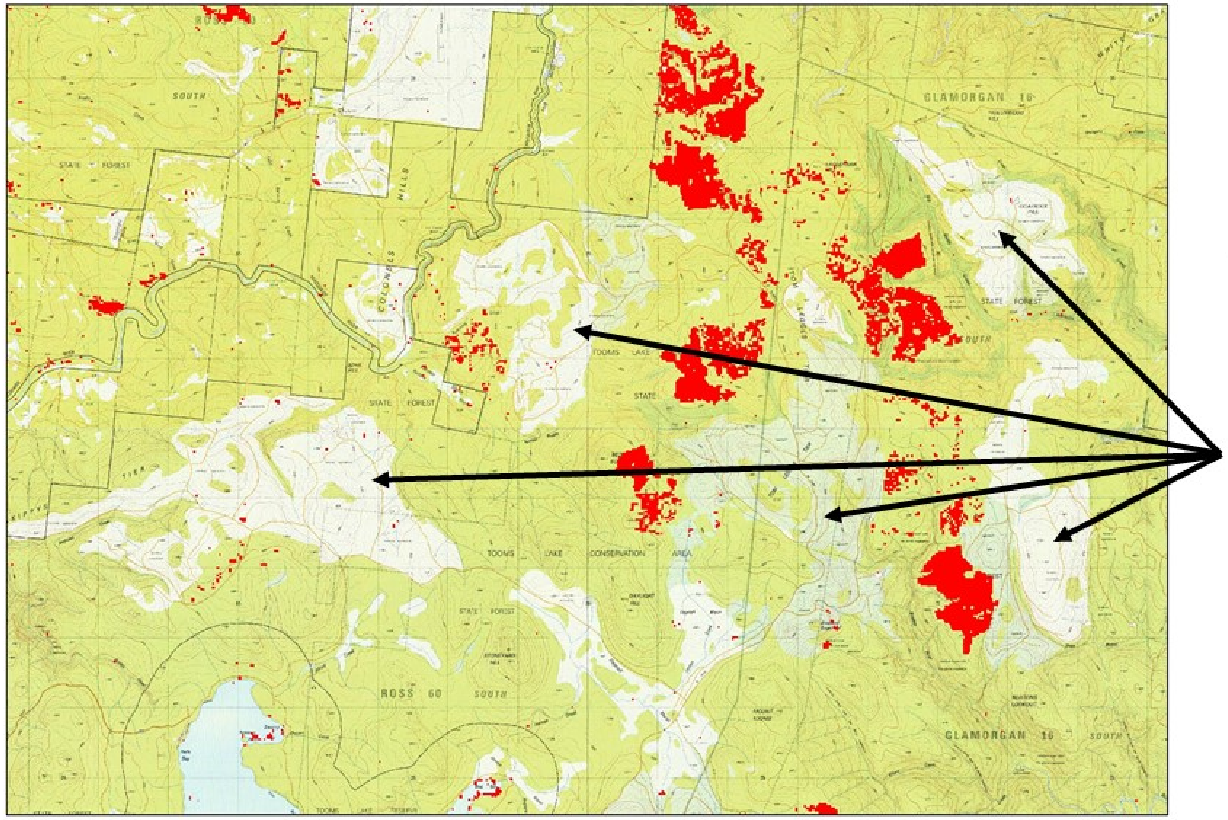

Figure S2b. Example of logging operations prior to ~1997 and not captured by the Global Forest Cover change layer – Tooms Lake region.

Red indicates Global Forest Cover change layer (Hansen et al. 2013).

White (or lighter) areas are identified as 'forestry operations' on Tasmanian 1:25,000 map sheets.