Figure 38.5 Orangutan using the 'orangutan bridge' over the Rasang River, a tributary of the Kinabatangan River. Photo: Ajirun Osman/HUTAN-KOCP.

to develop tools that will help conservation biologists to use and master population genetics concepts (i.e. Conservation Genetic Resources for Effective Species Survival (CONGress), http://www.congressgenetics.eu). The incorporation of genetic data into species action plans has recently been advocated, but will require the above-mentioned difficulties to be overcome (Frankham 2009; Laikre 2010). Genetic data must be integrated with an understanding of landscape dynamics and area-based conservation actions to achieve successful decisions concerning areas, landscapes and species.

Conclusions

Nearly 15 years have passed since genetic samples were collected by Goossens *et al.* (2005) in 2001, and it has been more than half a decade since the publication of the Orangutan Action Plan (Sabah Wildlife Department 2011). During this time, much was achieved to advance the knowledge of the LKWS orangutan's population genetics. It certainly stands out as a major achievement to have the data incorporated into an official management plan. Nonetheless, the orangutan is a slow breeder and it will take time before deleterious genetic effects are detected in this population. Time is pressing, land conversion in the area is still ongoing and the population size is still declining (Alfred *et al.* 2010; Ancrenaz 2008). For some species on the brink of extinction (i.e. the Sumatran rhinoceros, Goossens *et al.* 2013) a 10-year wait might be an unaffordable luxury. Therefore, faster mechanisms for the incorporation of genetic data into management plans should be devised and scientists and policy makers should also make a compromise regarding the extent of genetic information really needed before expediting the successful and urgent protection of a species like the orangutan through restoration of habitat connectivity and other means already known to us.

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