

5 Planned management actions

Planned Council actions to reduce impacts associated with flying-foxes in the Northern Beaches are outlined in Table 6. The actions align with legislation (Section 1.3), camp assessments (Section 3), and consultation with Council. Implementation of management actions must be considerate of approvals potentially required, site values, and in accordance with measures to avoid impacts (Appendix 5). Evaluation measures are provided for each action which will be used to evaluate action progress and success. Details of how the Plan and actions below will be implemented are in Section 6 .

Table 6 Planned management actions

Strategy	Action	Details	Applicable locations	Approvals required	Timeframe / Progress	Evaluation measure
Level 1 management						
Community engagement and awareness	Ensure clear and up-to-date information available regarding legislation and human and animal health	Ensure the community is aware of legislation around flying-foxes, and that management affecting flying-foxes is illegal without relevant approvals. Education should be delivered in the form of events, online material, hardcopy brochures, or in-situ signage (see below for more detail), and should include up-to-date health information, impact mitigation options available at a property level (e.g. odour-neutralising gel pots and noise attenuation fencing), and legislative responsibilities. One-on-one engagement may be required for primary-affect residents.	LGA-wide	No	Short-term and ongoing	Education program; community informed and engaged.
	Keep community informed of flying-fox numbers, monitoring trials and up-coming management	Engagement platforms including Facebook, websites, media release and digital/hard copy mail (e.g. brochures, fact sheets) will be utilised to maintain awareness and keep the community updated and informed.	LGA-wide	No	Short-term and ongoing	Up-to-date information readily available for the community.
	Provide in-situ flying-fox information at camps	Update/install interpretive signage at publicly accessible camps. Signs will convey key flying-fox information, including basic ecology and behaviour, and should aim to dispel common health misconceptions associated with flying-foxes.	Update signage at Balgowlah camp Install signage at Warriewood	No	Short-term	Flying-fox information available for community in-situ.

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	Create interpretive QR code walk with platform	Create an interpretive walk along the existing walkway through the Warriewood camp for the community to observe and learn about flying-foxes in an engaging and informative way. QR codes may be provided along the walkway to engage the community and provide key flying-fox information. A viewing platform overlooking the main waterbody below the camp may be built and incorporated into the walk as a way to showcase the flying-fox camp. Platform construction should be timed in winter when the camp is naturally empty.	Warriewood camp	Development approvals may be required for platform construction	Long-term	Community able to engage with the flying-fox camp in a positive manner, while also being provided with up-to-date information.
Impact mitigation	Establish Community Assistance Program and offer property modification /service subsidies	Investigate a Community Assistance Program that offers distance-scaled subsidies program for communities affected by flying-fox camps. Subsidies may cover property modification and/or services to manage impacts associated with flying-foxes (see Appendix 4 for further information). Note, subsidies have previously been offered to residents adjacent to Balgowlah and Avalon, which has assisted in reducing conflict.	Avalon, Balgowlah, and Warriewood camps	No	Long-term and ongoing	Community Assistance Program investigated and implemented. Subsidies offered to residents where feasible.
	Routine camp maintenance	Manage weeds, particularly vines to protect the canopy and woody weeds to ongoing health of mid-storey vegetation. This is particularly important in the core areas of habitat to maintain buffers and avoid flying-foxes being forced to edges closer to private properties. All weed control will be done carefully to avoid disturbing flying-foxes, and using a staged approach to avoid impacting habitat values or temporarily reducing heat refugia.	Avalon camp, Balgowlah camp – e.g. controlling <i>Ipomoea indica</i>	Authorised under the COP	Ongoing	Reduced weed density and health of canopy and mid-storey vegetation improved and maintained.
	Maintain water flow and quality	Maintain water flow below the camp to allow flying-foxes access to pool areas when rainfall is sufficient to belly-dip during hot weather. Water flow will be maintained by regularly monitoring and removing obstructions, when necessary (e.g. fallen branches and debris following storms), regularly cleaning gross pollutant traps (GPTs) (e.g. at Balgowlah camp), and removing dense wetland weeds (e.g. Salvinia at Warriewood camp). Regular GPT cleaning at Balgowlah camp will be undertaken every 1-2 months (using a truck with a mechanical arm), with a full clean (using truck and vacuum to remove debris) undertaken twice per year (or once every two months when	Balgowlah and Warriewood camp	No	Short-term and ongoing	Water flow maintained below camps.

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		below average rainfall). Standard measures to mitigate impacts to flying-foxes during GPT cleaning are outlined in Appendix 5.				
	Emergency tree removal	<p>In some cases, emergency roost tree removal may be required at short notice to remove dead/damaged trees that are a hazard to humans, flying-foxes, infrastructure and/or adjacent properties. In such cases, wherever possible works will be undertaken at night if the camp is occupied and after flying-foxes have vacated the camp.</p> <p>Where emergency removal of a non-roost tree is required, Council should also aim to delay works until flying-foxes have vacated the camp. However, works may be required urgently to ensure human safety, in which case they may be done during the day provided: no flying-foxes are roosting in the tree or within 10 m of the tree being removed (in adjacent vegetation), no risk of heat stress event ($> 38^{\circ}\text{C}$), minimal signs of stress prior to and during tree works (monitored by ecologist), camp not at full capacity (i.e. to ensure sufficient refugia area for flying-foxes to shift away from tree removal works).</p> <p>Tree removal will be limited to the minimum amount needed to reduce risks. A licenced wildlife carer and/or ecologist will be on site for the duration of the proposed works. Where possible, native habitat trees should be planted to replace the loss of flying-fox roosting habitat.</p>	Primarily Avalon and Balgowlah camps, Warriewood if needed	Authorised under the COP, approvals may be required under other legislation for protected vegetation / other ecological values.	As required	Emergency tree removal undertaken safely to minimise potential impacts to humans, flying-foxes, and properties.
	Track maintenance	Maintain walking/access tracks to flying-fox camps to ensure community amenity values are retained. Track maintenance may involve cleaning tracks with high-pressure hoses, repairing damaged sections, mowing (e.g. at Avalon), and trimming understorey and/or overhanging vegetation.	Avalon, Balgowlah, and Warriewood camps	Authorised under the COP	Short-term and ongoing	Safe access to public areas maintained in/around camps.
	Alternative habitat creation	Protect/improve/restore low conflict roost habitat to avoid future conflict.	LGA-wide	No	Long-term	Low conflict camps protected, alternative habitat locations identified and potential to restore habitat investigated.

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	Revegetation of existing camp habitat	Restore and protect roosting habitat in low conflict areas of camps (e.g. centre portions of Balgowlah and Avalon camps) to encourage flying-foxes to roost further away from residential dwellings. Plant species will be selected to encourage flying-fox roosting, such as rainforest species that provide dense mid-storey vegetation cover and ground cover to achieve a favourable microclimate. Restoration must consider the need for adequate mid-storey vegetation as heat refugia.	Avalon, Balgowlah, and Warriewood camps	Authorised under the COP	Long-term	Improved camp habitat, resulting in positive conservation and welfare outcomes for flying-foxes and reduced impacts on residents (assuming revegetation encourages flying-foxes to roost away from boundaries).
	Odour reducing / masking plants	Boundaries between flying-fox camps and residents can be densely planted with plants that produce fragrant flowers in order to create an odour barrier/buffer to reduce odour impacts. This option may be currently suitable at Balgowlah and Avalon camps, where residents are negatively impacted by flying-fox odour.	Avalon and Balgowlah camps	No	Long-term	Reduced odour impacts for residents living adjacent to flying-fox camps.
	Camp monitoring	Ensure regular (at least quarterly) monitoring of all active flying-fox camps within the Northern Beaches LGA as part of the NFFMP, including records of camp spatial extents.	Avalon, Balgowlah, and Warriewood camps	No	Ongoing	Regular monitoring undertaken at all Northern Beaches camps as part of the NFFMP and data used to inform conservation and management.
Conservation	Maintain high welfare standards during routine camp maintenance	Ensure all management actions are considerate of flying-fox habitat and welfare requirements, including mid-storey for protection during extreme weather, weed treatment and removal and appropriate mowing regimes when flightless young are present.	Avalon, Balgowlah, and Warriewood camps	Routine camp maintenance authorised under the COP	Ongoing	All camps to have mid-storey vegetation for protection during extreme weather and flying-fox welfare is maintained during works.
Avoiding future conflict,	Protocols to	Collaborate with wildlife rescue and care organisations to monitor potential heat stress events (HSE) during predicted	LGA-wide	No	Short-term and	Heat Stress Response Plan

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conservation	manage incidents	hot weather. Develop a Heat Stress Response Plan that outlines information on the factors that contribute to HSEs, how to monitor flying-fox stress, the importance of having a camp-specific response plan, personnel roles in attending to HSEs, active spraying of flying-foxes, recovery and response to mortalities, as well as the importance of collecting data on HSEs.			ongoing	developed. Ongoing communication with wildlife rescue and care organisations.
	Support flying-fox carers	Support the ongoing rescue, care, and conservation efforts of local wildlife carers, particularly during flying-fox influxes in the LGA and HSEs.	LGA-wide	No	Ongoing	Strong relationship between flying-fox carers and Council.
	Environmental Impact Statement (EIS) submission for the Beaches Link Tunnel State project	Council will encourage further consideration of potential impacts to flying-foxes and camp habitat associated with the project, and appropriate project mitigation measures.	Balgowlah camp	No	ASAP	Engaged with regulators and project where relevant.
Avoiding future conflict	Support research	Support research, particularly projects which will assist in understanding local flying-fox movements and ways to mitigate impacts on the community. A priority area of research is to better understand foraging resources in the area to allow proactive management and preparation for future influxes.	LGA-wide	No	Long-term and ongoing	Council up-to-date on contemporary research and relevant outcomes used to inform management at the three camps.
	Appropriate land use planning	Measures to avoid future conflict between camps and the community will be considered when assessing development applications. Identify potential buffers areas to zone as flying-fox management areas to mitigate impacts to residents. Consider habitat protection measures (zoning, Biodiversity Agreements) for flying-fox camps.	Avalon, Balgowlah, and Warriewood camps	No	Long-term	Flying-fox camp management areas incorporated into planning instruments.
Level 2 management						
Impact mitigation	Maintain existing buffers through vegetation management (trimming/removal)	Maintain existing buffers between residents and flying-foxes at Balgowlah through selective vegetation management (particularly along eastern and south-eastern boundaries) and Avalon (particularly bordering 29 Therry St and 17 Net Rd). Maintenance works may include trimming trees overhanging buffers, mowing, weed removal, and pineapple	Balgowlah and Avalon camps	Authorised under the COP, approvals may be required under other legislation for protected		Existing buffers are maintained.

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		pruning (at Avalon camp)		vegetation / other ecological values. Trimming/tree removal to create a buffer of <u>up to 30 m</u> is authorised under the COP, though certain restrictions must be adhered to (see Part 2, Section 6 of COP).		
	Investigate canopy-mounted sprinklers	Investigate installing canopy-mounted sprinklers (CMS) at the Balgowlah camp to potentially increase the buffer between residents and the flying-fox camp as the centre of the camp is restored. Residents should be consulted prior to installation to ensure this management option is suitable, considering operational costs are generally covered by residents.	Balgowlah camp	Approvals required for vegetation works associated with installing CMS.	Investigate and implement if deemed suitable – long-term	Increased buffer between residents and flying-fox camp, resulting in decrease negative impacts/conflict.
	Odour neutralising trial	Investigate potential for outdoor-odour neutralising trial (ONT) at Avalon and Balgowlah to mitigate odour impacts to adjacent residents. Untested and innovative trials may constitute Level 2 actions so licence from DPE required. Advise Warriewood Square management about the potential for odour neutralising technology/filtration on air-conditioning units, or potential for management to relocate intake away from the camp.	Avalon and Balgowlah camp	May require licence under the BC Act	Short-term	If considered feasible, trial undertaken.
Level 3 Management						
Impact mitigation	Nudging	Nudging may be considered if Level 1 and 2 management options have been exhausted and risk has not been sufficiently mitigated. Level 3 management options require state and potentially federal approval, and will be dependent on sufficient Council resources being available.	Not currently suitable at any camp	Requires licence under the BC Act	N/A	N/A
	Dispersal	Dispersal may be considered if Level 1 and 2 management	Not	Requires	N/A	N/A

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		options have been exhausted and risk has not been sufficiently mitigated. Level 3 management options require state and potentially federal approval, and will be dependent on sufficient Council resources being available.	currently suitable at any camp	licence under the BC Act		