

4.4.2 Potential Impacts on Biodiversity

Impacts during the construction and post-construction/ operational phases were separated for habitat, flora, and fauna, as detailed in **Section 4.5**. These impacts fall into two main categories: (1) direct impacts – affecting habitats and species located within the worksites; and (2) indirect impacts – affecting habitats and species outside the worksites but within the designated impact zones.

The direct impact zone is defined as the area within the indicative boundary of future development area, excluding Telok Blangah Hill Park (**Figure 4-18**). The indirect impact zone is defined as a 30 meter buffer extending from the boundary of the direct impact zone. This buffer distance assumes that edge effects, environmental changes in habitats directly adjacent to construction areas, are most significant within 30 meters of the disturbance (**Figure 4-18**).

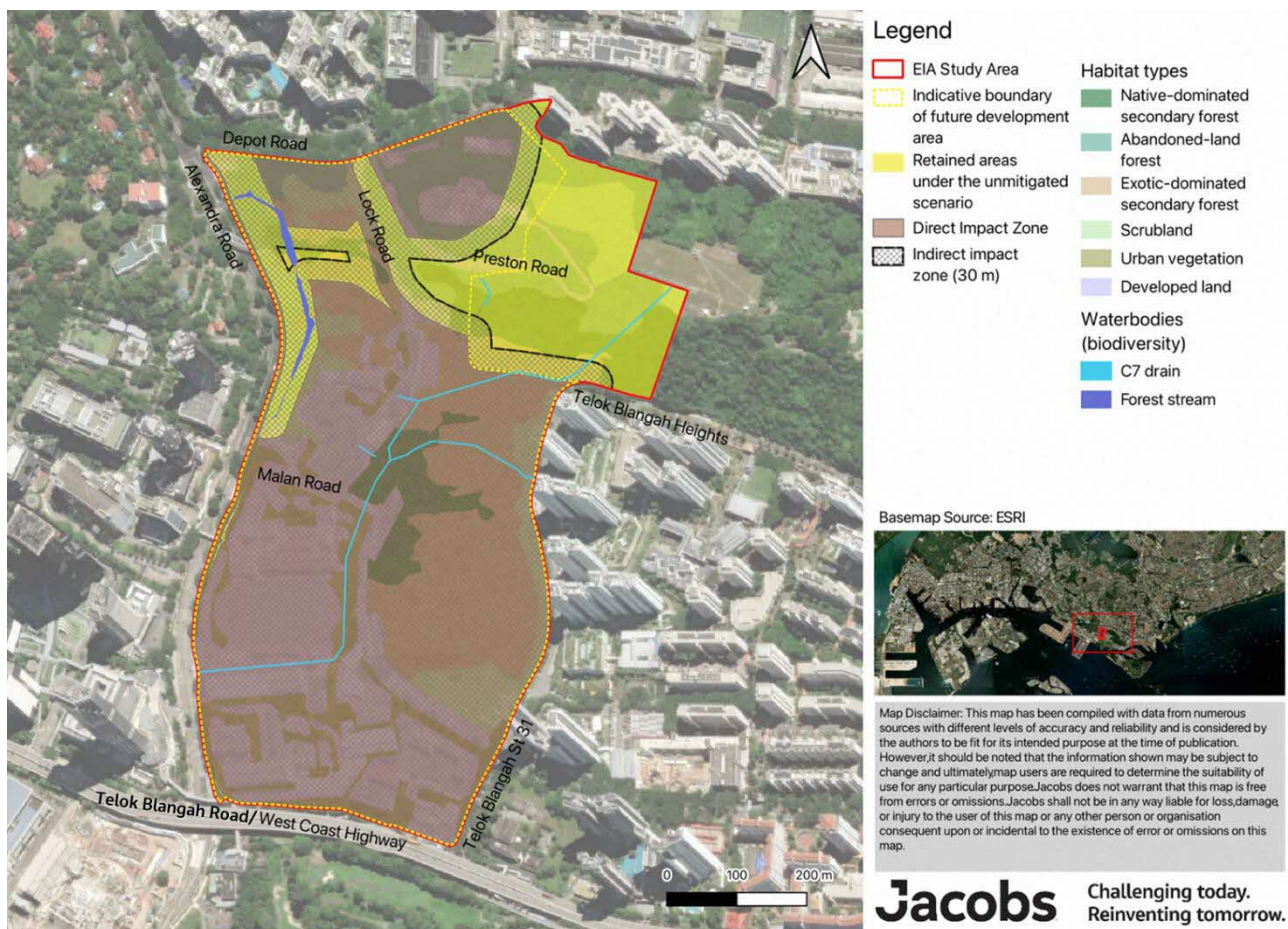


Figure 4-18: Direct and Indirect Impact Zones under the Unmitigated Scenario

Habitats and plants that fall within the impact zones of the future development were identified as biodiversity sensitive receptors (**Figure 4-19**). Fauna species that were recorded during the baseline study or deemed probable were also identified as biodiversity sensitive receptors.

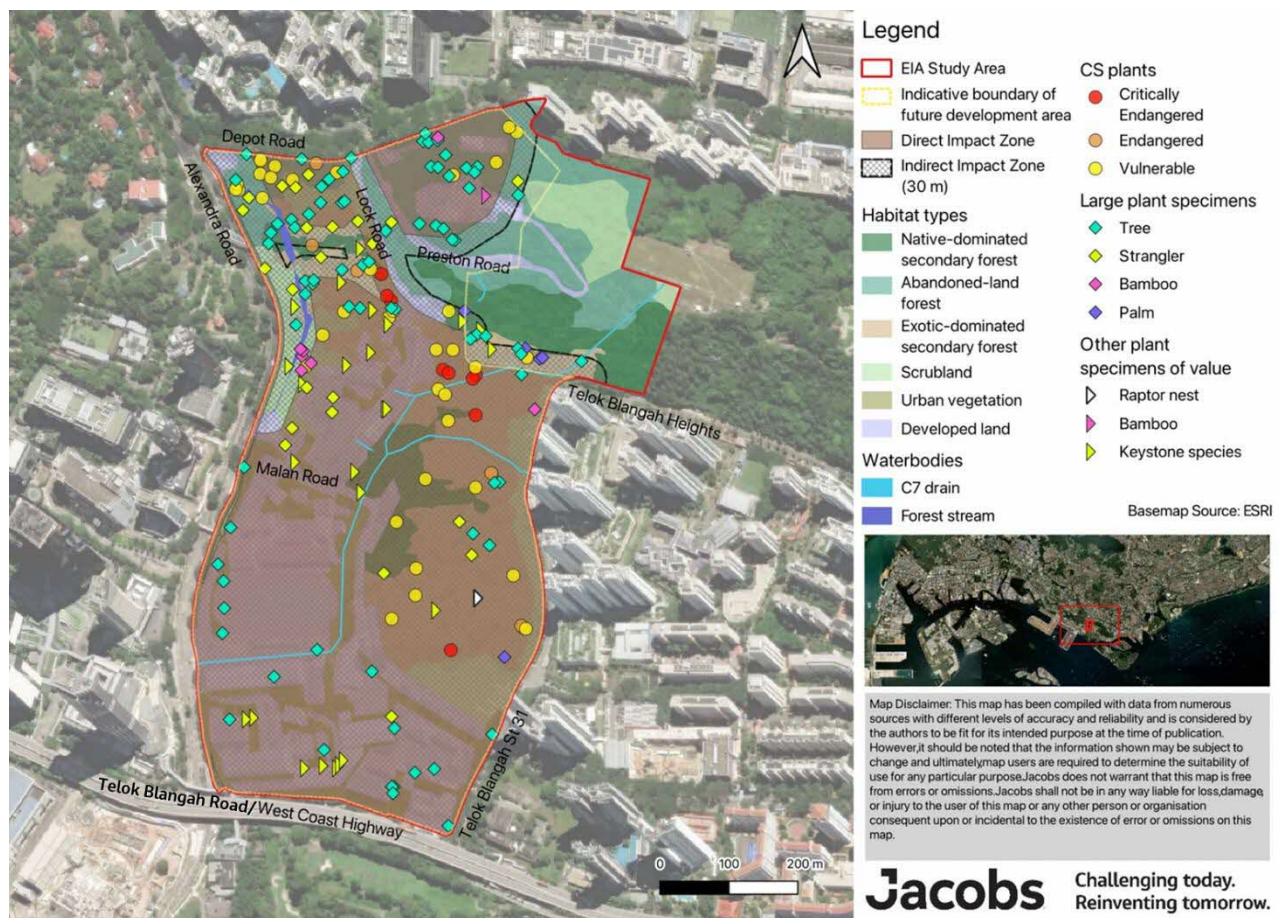


Figure 4-19: Habitat and Flora Receptors within the Direct and Indirect Impact Zones

4.4.3 Minimum Control Measures

Table 4-16 lists biodiversity-specific minimum controls commonly implemented in Singapore for similar construction and operational activities. These are assumed to be implemented for the impact assessment.

Table 4-16: Minimum Control Measures Assumed to be Implemented at the Construction and Operational Phases

Phase	Activities	Minimum Control Measures
Construction	General	- Install hoarding that is embedded at least 300 mm into the ground to delineate worksite. - Minimise fogging by implementing preventive measures for mosquito to remove sources of stagnant water or water-bearing receptacles (e.g., provide well-maintained pitched roof, clear discarded items daily, store materials appropriately, level up ground depression/ uneven surfaces, ensure effective drainage flow). - Practice due diligence in proper storage and handling of machinery to prevent release of chemicals, fuels or other potentially harmful materials. - Transfer of fuel shall be done over contaminant trays and mats to prevent spillage into the ground. - Ensure oil-containing equipment or machineries are inspected for leaks before being put into use.

Phase	Activities	Minimum Control Measures
		• Provide emergency spill kits on site in the event of any fuel spillages. The emergency response team shall also be competent in the use of these spill kits. • Chemical and fuel in drums, carboys, containers, etc shall be stored in a designated storage area within a building or covered shed with concrete floors and containment facilities to contain any leak or spillage. • A full containment should be provided for bulk storage oil tanks, including skid tanks. • Ensure all hazardous substances and chemical containers are labelled as per the Globally Harmonised System (GHS) requirement. • Ensure a chemical inventory is maintained to track the movement of all hazardous substance and chemicals. • Return the chemicals back to its designated storage areas when not in use. • Transfer of chemicals shall be done over contaminant trays and mats to prevent spillage into the ground. • All leaks and spillages in the storage area or construction site shall be collected and sent to a licensed toxic waste collector for proper disposal. • Ensure Toxic Industrial Waste (TIW) are stored in a designated storage area within a building or covered shed with concrete floors and containment facilities to contain any leak or spillage. • Maintain a TIW register, which is to be updated on a weekly basis. • TIW shall be collected regularly by a licensed TIW collector for off-site disposal. • Ensure leaks and spillages in the TIW storage area or construction site are collected and sent to a licensed toxic waste collector for proper disposal.
Construction	Vegetation clearance	• No felling or damaging of trees without prior approval under the Parks and Trees Act. • Set up Tree Protection Zones (TPZs) around trees or other plant specimens to be retained within the worksites, within which no construction works are allowed. This should be advised by certified arborists and in accordance with NParks' guidelines. • Conduct directional site clearance. • Conduct inspections of fauna prior to felling or removal of vegetation. This should be done by an ecologist who is able to identify wildlife and/ or active nesting structures, such as bird nests, tree hollows and/ or burrows, and bamboo clusters. • Implement soil erosion control measures prior to vegetation clearance. The ECM plan should be formulated by a Qualified Erosion Control Professional (QECF). • Use only fully biodegradable wildlife-friendly erosion control blankets (ECBs) to avoid trapping fossorial fauna such as snakes.
Construction	Earthworks and aboveground construction	• Implement soil erosion control measures. • Use only fully biodegradable wildlife-friendly ECBs to avoid trapping fossorial fauna such as snakes. • Proper storage of materials likely to leach harmful chemicals and fuel-powered equipment by storing them away from waterbodies and/or sensitive habitats. • Implement dust control measures. • Keep noise levels within approved limits, and to implement noise barriers where required.

Phase	Activities	Minimum Control Measures
Construction	Setting up of worksite, stockpiling	Locate facilities other than the proposed construction worksites (e.g., site offices, storage yards, rest areas, access route, etc.) within the worksite itself or on existing built-up areas/ agreed working spaces; ensure no clearing of additional habitats.
Post-construction/ Operation	General	- Minimise fogging by implementing preventive measures for mosquito to remove sources of stagnant water or water-bearing receptacles (e.g., provide well-maintained pitched roof, clear discarded items daily, store materials appropriately, level up ground depression/ uneven surfaces, ensure effective drainage flow). - No killing, trapping, taking or keeping any wildlife under the Wildlife Act.

4.4.4 Evaluation of Impact Significance

The Impact Assessment follows the RIAM method defined in **Section 3.3**.

For biodiversity receptors, **A2.2 Magnitude of Change** is calculated by multiplying two subcategories: **A2.2a Impact Intensity** and **A2.2b Impact Likelihood**. The scoring criteria for each subcategory (A2.2a and A2.2b) are shown in **Table 4-17**, and the conversion of the calculated score to the A2.2 Magnitude of Change (A2.2a × A2.2b) is shown in **Table 4-18**.

Table 4-17: Criteria of Scoring for A2.2a Impact Intensity and A2.2b Impact Likelihood for Biodiversity Receptors

Components of A2.2 Magnitude of Change for Biodiversity	Score/ General Criteria Considered	
A2.2a – Impact Intensity Impact intensity is defined by the characteristics of each receptor	3:	Major
	2:	Medium
	1:	Minor
	0:	No change/ status quo
A2.2b – Impact Likelihood Likelihood is defined largely based on extent of development works	4:	Almost certain/ continuous
	3:	Likely/ regular
	2:	Possible/ occasional
	1:	Less likely/ rare
	0:	Unlikely/ Remote

Table 4-18: A2.2 Magnitude of Change Scoring Categories based on Calculated Scores (A2.2a Impact Intensity × A2.2b Impact Likelihood)

A2.2 Magnitude of Change	A2.2 Score		Calculated Score Range (A2.2a × A2.2b)
Score scaling	3:	High impact/ changes	8-12
	2:	Medium impact/ changes	4-7
	1:	Low impact/ changes	1-3
	0:	No change/ status quo/ negligible	0

4.4.5 Construction Phase Impact

4.4.5.1 Habitat

The definitions for impact intensity and likelihood for habitat receptors are given in **Table 4-19** and **Table 4-20**. The values assigned for each criterion in RIAM as well as the resulting impact significance for all habitat receptors are provided in **Appendix 4I**.

Table 4-19: Definitions of Each Level of Impact Intensity for Impact Types During Construction Phase for Habitat Receptors

Impact Type	Negligible	Low	Medium	High
Loss of habitat	The habitat does not overlap with the worksites	< 10% of the habitat overlaps with the worksites	10–40% of the habitat overlaps with the worksites	> 40% of the habitat overlaps with the worksites Worksite overlaps with waterbody
Forest edge effects	<u>Terrestrial habitats</u> The habitat does not overlap with areas 30 m from the worksites <u>Aquatic habitats</u> The dominant terrestrial habitat adjacent to the aquatic habitat does not overlap with areas 30 m from the worksites	<u>Terrestrial habitats</u> < 10% of the habitat overlaps with areas 30 m from the worksites <u>Aquatic habitats</u> < 10% of the dominant terrestrial habitat adjacent to the aquatic habitat overlaps with areas 30 m from the worksites	<u>Terrestrial habitats</u> 10–40% of the habitat overlaps with areas 30 m from the worksites <u>Aquatic habitats</u> 10–40% of the dominant terrestrial habitat adjacent to the aquatic habitat overlaps with areas 30 m from the worksites	<u>Terrestrial habitats</u> > 40% of the habitat overlaps with areas 30 m from the worksites <u>Aquatic habitats</u> > 40% of the dominant terrestrial habitat adjacent to the aquatic habitat overlaps with areas 30 m from the worksites
Habitat degradation	<u>Terrestrial habitats</u> The habitat does not overlap with areas 30 m from the worksites <u>Aquatic habitats</u> No change in surface water quality	<u>Terrestrial habitats</u> < 10% of the habitat overlaps with areas 30 m from the worksites <u>Aquatic habitats</u> Some changes in surface water quality	<u>Terrestrial habitats</u> 10–40% of the habitat overlaps with areas 30 m from the worksites <u>Aquatic habitats</u> Considerable changes in surface water quality	<u>Terrestrial habitats</u> > 40% of the habitat overlaps with areas 30 m from the worksites <u>Aquatic habitats</u> Extensive changes in surface water quality

Table 4-20: Definitions of Each Level of Likelihood for all Impact Types During Construction for Habitat Receptors

Likelihood	Unlikely/ Remote	Less Likely/ Rare	Possible/ Occasional	Likely/ Regular	Almost Certain/ Continuous
Loss of habitat	The habitat does not overlap with the worksite	N.A.	N.A.	N.A.	The habitat overlaps with the worksite

Likelihood	Unlikely/ Remote	Less Likely/ Rare	Possible/ Occasional	Likely/ Regular	Almost Certain/ Continuous
Forest edge effects	The habitat does not overlap with the worksite	The worksites are small (e.g., trails, boardwalks) and/ or is not expected to change vegetation structure significantly to effect changes in microclimatic conditions (e.g., minimal tree or vegetation removal)	The worksites are of considerable size (e.g., single lane roads) and/ or is expected to change some vegetation structure significantly to effect changes in microclimatic condition (e.g., some tree or vegetation removal)	The worksites are large (e.g., buildings, multiple lane roads) and/ or is expected to change vegetation structure significantly to effect changes in microclimatic conditions (e.g., extensive tree or vegetation removal)	N.A.
Habitat degradation	N.A.	The likelihood of habitat degradation is presumed to be Less Likely for all habitat receptors, based on the assumption that all minimum controls are adequately and properly implemented	N.A.	N.A.	N.A.

Seven habitat types (i.e., all habitats excluding developed land) were assessed for the following impacts: (1) loss of habitat, (2) forest edge effects, and (3) habitat degradation. A summary of the results is given in **Table 4-21**, and the impacts with Slight Negative and above significance are briefly explained below.

Table 4-21: Summary of Construction Impacts to Habitat Receptors and Number of Habitat Types Affected

Impact Type	Major Negative	Moderate Negative	Minor Negative	Slight Negative	No Change
Loss of Habitat	1	3	3	0	0
Forest Edge Effects	0	0	3	0	4
Habitat Degradation	0	0	1	6	0

4.4.5.1.1 Loss of Habitat

Loss of habitat is defined as the direct removal of vegetation to create space for construction activities, as well as changes in waterbody due to backfilling, and/or changes in hydrology.

Vegetation clearance will occur in all terrestrial and aquatic habitat types: native-dominated secondary forest, abandoned-land forest, exotic-dominated secondary forest, scrubland/ grassland, urban vegetation, forest/ rural stream, and concrete drain/ canal. Based on the area of vegetation clearance, the impact intensity is "High" for exotic-dominated secondary forest, abandoned-land forest, scrubland/ grassland, urban vegetation, and concrete drain/ canal. The impact intensity is "Medium" for native-dominated secondary forest and abandoned-land forest. The impact intensity is "Low" for forest/ rural stream. The likelihood of occurrence is "Certain" for all habitat types. Overall, the impact significance of loss of habitat will be **Major Negative** for native-dominated secondary forest as it is of "High" ecological value. The impact significance will be **Moderate Negative** for abandoned-land forest, exotic-dominated secondary forest, and forest/ rural stream and **Minor Negative** for the remaining habitat types.

4.4.5.1.2 Forest Edge Effects

Forest edge effects refer to the changes in microclimatic conditions of forested habitats due to vegetation removal. This includes changes in the exposure of direct sunlight, temperature, humidity, wind exposure, etc. For aquatic habitats, the impact intensity will follow that of the dominant riparian vegetation.

Forest edge effects are "Likely" to occur in the native-dominated secondary forest, abandoned-land forest, and exotic-dominated secondary forest. Based on the proportion of each habitat type that falls within the 30 m impact zone adjacent to the proposed worksites, the impact intensity is "High" for exotic-dominated secondary forest and "Medium" for native-dominated secondary forest and abandoned-land forest. Overall, the impact significance is **Minor Negative** for these three habitat types.

4.4.5.1.3 Habitat Degradation

Habitat degradation refers to the disturbances to habitats as a result of construction activities (e.g., improper disposal of construction waste, accidental release of hazardous materials, etc.)

Habitat degradation is "Less Likely" to occur in all the terrestrial and aquatic habitat types, assuming all minimum controls are adequately and properly implemented (**Section 4.4.3**). Based on the proportion of each habitat type that falls within the 30 m impact zone adjacent to the proposed worksites, the impact intensity is "High" for all the habitat types except for native-dominated secondary forest, for which the impact intensity is "Medium". Overall, the impact significance of habitat degradation will be **Minor Negative** for native-dominated secondary forest as it is of "High" ecological value. The impact significance will be **Slight Negative** for the remaining habitat types.

The values assigned for each criterion in RIAM as well as the resulting impact significance for habitat receptors are provided in **Appendix 4I**.

4.4.5.2 Flora

The definitions for impact intensity and likelihood for flora species receptors are presented in **Table 4-22** and **Table 4-23**, respectively. The values assigned for each criterion in RIAM as well as the resulting impact significance for all flora receptors are provided in **Appendix 4J**.

The 29 flora species of high ecological value were assessed for the following impacts: (1) Mortality and (2) Decline in Plant Health and Survival. A summary of the impacts on flora receptors is given in **Table 4-24**, with the numbers indicating the number of species in each impact significance category.

Table 4-22: Impact Intensity During Construction Phase for Flora Receptors

Impact Type	Negligible	Low	Medium	High
Mortality	No plant specimens of this species are within the worksites	< 50% of all plant specimens of this species are within the worksites	≥ 50% of all plant specimens of this species are within the worksites	All plant specimens of this species are within the worksites
Decline in plant health and survival	No specimens of this species are within 30 m from the worksites	< 50% of all specimens of this species are within 30 m from the worksites	≥ 50% of all specimens of this species are within 30 m from the worksites	All specimens of this species are within 30 m from the worksites

Table 4-23: Impact Likelihood During Construction Phase for Flora Receptors

Likelihood	Mortality	Decline in Plant Health and Survival
Unlikely/ Remote	No plant specimens of this species are within the worksites	No formation of forest edges (i.e., construction activities are fully underground and/ or in existing built-up areas outside the forest) that changes the existing microclimate conditions
Less Likely/ Rare	Plants specimens of this species located in the worksite is less likely to be inflicted with mechanical injuries during construction	Formation of scrubland edges in scrubland areas only
Possible/ Occasional	No count data and/ or locations of specimens of this species is available, but specimens could possibly be within the worksites	Formation of some forest and scrubland edges in urban vegetation, scrubland and/ or forested areas
Likely/ Regular	N.A.	N.A.
Almost Certain/ Continuous	Plant specimens of this species located within the worksite are cleared	Formation of new forest edges (i.e., complete clearance within forested areas)

Table 4-24: Summary of Construction Impacts to Flora Receptors and Number of Species Affected

Impact Type	Major Negative	Moderate Negative	Minor Negative	No Change	N.A.
Mortality	12	3	6	8	0
Decline in Plant Health and Survival	0	6	3	14	18

4.4.5.2.1 Mortality

Mortality refers to the direct removal of vegetation to create space for construction activities.

Of the 29 species assessed during the construction phase pre-mitigation, 12 were assessed to an impact significance of **Major Negative** because of "Medium" and "High" impacts on mortality, combined with the threatened status of the taxon and an "Almost Certain" likelihood of clearance. These include all recorded specimens of the critically endangered *Antiaris toxicaria* and *Ficus sinuata*, and endangered *Symplocos adenophylla* and *Ficus apiocarpa*.

Three vulnerable species—*Endospermum peltatum*, *Goniphlebiium percussum*, and *Macaranga griffithiana*—were assessed to face an impact significance of **Moderate Negative**. Thirty-three per cent (33%) of *E. peltatum* and *M. griffithiana* and 50% of *G. percussum* specimens fall within the worksite, resulting in "Low" and "Medium" impact intensity on mortality, respectively.

Six keystone species of the genus *Ficus* were assessed to an impact significance of **Minor Negative** with "Low" to "High" impacts on mortality. The reduction in overall impact significance is attributed to the non-threatened status of the species, and reduced impact extent of clearance relative to species of conservation significance. Finally, eight species, *Archidendron contortum*, *Burmannia coelestis*, *Linostoma pauciflorum*, *Litsea cf. castanea*, *Litsea umbrellata*, *Olea brachiata*, *Pittosporum ridleyi*, and *Trema tomentosum*, were assessed to an impact significance of **No Change**, as all recorded specimens fall within the retained areas of Telok Blangah Hill Park.

4.4.5.2.2 Decline in Plant Health and Survival

Decline in plant health and survival may arise from changes in microclimatic conditions (i.e., dust, noise, light, temperature, and humidity), or changes in hydrology and/or surface water quality.

Six species were assessed to an impact significance of **Moderate Negative** with "Low" to "Medium" impact intensities. These include a single specimen of the endangered *Litsea cf. castanea*, which falls approximately 16m from the worksite, making it likely to face edge effects from forest clearance and a resultant possible decline in health during the construction phase.

Three keystone species – *Ficus benjamina*, *Ficus microcarpa* and *Ficus variegata* – were assessed to an impact significance of "**Minor Negative**". Nine specimens (82%) of *F. benjamina*, two specimens (40%) of *F. microcarpa*, and five specimens (36%) of *F. variegata* fall within 30m of the worksite, resulting in "Low" and "Medium" impact intensities, with "Possible/ Occasional" impact likelihood.

Six species – *Archidendron contortum*, *Goniophlebium percussum*, *Linostoma pauciflorum*, *Macaranga griffithiana*, *Pittosporum ridleyi*, and *Trema tomentosum* – were assessed to have an impact significance of **No Change**, as all recorded specimens fall more than 30 m from the worksite, and are not expected to face edge effects as a result of forest clearance.

Finally, the remaining 18 species were not assessed (impact significance of **N.A.**) for decline in health and survival as they are presumed to be cleared pre-mitigation, and therefore not on site during the construction phase.

4.4.5.3 Fauna

The definitions for impact intensity and likelihood for fauna species receptors of conservation significance are presented in **Table 4-25** and **Table 4-26**, respectively.

Table 4-25: Definitions of Level of Impact Intensity for all Impact Types During Construction Phase for Fauna Species

Impact Type	Negligible	Low	Medium	High
Loss of/ reduction in habitats and food sources	Loss of/ reduction in habitats and food sources	Loss of/ reduction in habitats and food sources	Loss of/ reduction in habitats and food sources	Loss of/ reduction in habitats and food sources

Impact Type	Negligible	Low	Medium	High
Accidental injury or mortality	Species with negligible susceptibility to accidental injury/ mortality from construction activities (large vehicles, excavation, piling, etc.) and roadkills	Species with low susceptibility to accidental injury/ mortality from construction activities (large vehicles, excavation, piling, etc.) and roadkills: Volant species (e.g., odonates, butterflies, highly volant birds, most bats)	Species that are mobile but possibly susceptible to accidental injury/ mortality from construction activities (large vehicles, excavation, piling, etc.) and roadkills: - Less volant birds - All amphibians - Some mammals (e.g., squirrels, shrews)	Species with high susceptibility to accidental injury/ mortality from construction activities (large vehicles, excavation, piling, etc.) and roadkills: - Reptiles - Some mammals (e.g., Sunda pangolin, Long-tailed macaque, Smooth-coated otter)
Human-wildlife conflict	Species that are not perceived as nuisance or threats by construction personnel: - Odonates - Butterflies - Most birds - Bats - Amphibians	Species that are possibly perceived as both nuisance and threats by construction personnel, less tolerant of human presence and urban environments: Some reptiles	Species that are typically perceived as nuisance and possibly as threats by construction personnel, highly tolerant of human presence and urban environments, and frequently implicated in human-wildlife conflict: - Smooth-coated otter - Aculeate hymenopterans	Species that are typically perceived as both nuisance and threats by construction personnel, highly tolerant of human presence and urban environments, and are frequently implicated in human-wildlife conflict: - Long-tailed macaque - Some snakes
Loss of/ reduction in of ecological connectivity for fauna movement (within region)	Not dependent on connected habitats for dispersal and able to traverse urban infrastructure	Slightly dependent on connected habitats for dispersal and adaptable to traverse urban infrastructures if needed	Dependent on connected habitats for dispersal	Highly dependent on connected habitats for dispersal
Light disturbance	Species that are not sensitive to changes in light levels: aculeate hymenopterans, most aquatic species	Species that are slightly sensitive to changes in light levels: odonates, butterflies	Species that are sensitive to changes in light levels: diurnal birds, reptiles, and mammals	Species that are highly sensitive to changes in light levels: nocturnal, crepuscular fauna
Human disturbance	Species that are not sensitive to human presence	Species that are slightly sensitive to human presence	Species that are sensitive to human presence	Species that are extremely sensitive to human presence, and nesting birds

Table 4-26: Definitions of Each Level of Likelihood for all Impact Types During Construction Phase for Fauna Species Receptors

Likelihood	Definition
Unlikely/ Remote	Impact is not expected to happen during the construction phase.
Less Likely/ Rare	Impact is not likely to happen during the construction phase.
Possible/ Occasional	Impact could possibly happen or known to occur during the construction phase.
Likely/ Regular	Impact is a common occurrence during the construction phase.
Almost Certain/ Continuous	Impact is a continual or repeated process during the construction phase.

Five construction phase impact types were identified and assessed for the pre-mitigated fauna receptors: (1) Loss of/ reduction in habitats and food sources; (2) loss of/ reduction of ecological connectivity for fauna movement; (3) accidental injury or mortality; (4) light disturbance; (5) human-wildlife conflict; and (6) human disturbance.

A total of 83 species of high ecological value were assessed. The impact significance ranged from **No Change** to **Major Negative** with minimum control measures in place. The more substantial impact arising from each impact type are briefly explained below. A summary of all the impact on fauna receptors is given in **Table 4-27**, with the numbers indicating the number of species in each impact significance category.

The list of species evaluated, and values assigned for each criterion in RIAM are provided in **Appendix 4K**.

Table 4-27: Summary of Construction Impacts to Fauna Receptors and Number of Species Affected

Impact Type	Major Negative	Moderate Negative	Minor Negative	No Change
Loss of/ reduction in habitats and food sources	60	23	0	0
Loss/ reduction of ecological connectivity for fauna movement	0	63	0	20
Accidental injury or mortality	2	10	34	37
Light disturbance	0	46	37	0
Human-wildlife conflict	0	2	4	77
Human disturbance	0	0	83	0

4.4.5.3.1 Loss of/ Reduction in Habitats and Food Sources

The loss of/ reduction in habitats and food sources for fauna arise from the direct removal of vegetation, nests or roost sites to create space for construction activities.

Under the unmitigated scenario, Telok Blangah Hill Park is retained while complete site clearance is assumed for the rest of the indicative boundary of future development area. This results in **Major Negative** impact for 61 species due to the "High" intensity and "Almost certain/ continuous" likelihood of habitat loss and reduction in food sources.

The retention of most of the forest stream as part of Telok Blangah Hill Park reduces the intensity of impacts on aquatic species. A **Moderate Negative** impact is expected for the remaining 23 species, primarily aquatic fauna. These include water-associated birds such as yellow bittern, great egret, and buffy fish owl, as well as odonates and reptiles like the Asian softshell turtle.

4.4.5.3.2 Loss/ Reduction of Ecological Connectivity for Fauna Movement

This assessment considers the potential loss or reduction of ecological connectivity for fauna movement within the EIA Study Area as well as with the surrounding parks (i.e. Telok Blangah Hill Park beyond the EIA Study Area; Berlayar Creek and Labrador Nature Reserve).

Moderate Negative impact is expected for 63 species, generally forest-associated species that are dependent on connected habitats for dispersal. These include forest-associated birds such as the Straw-headed bulbul, Thick-billed green pigeon, and Square-tailed drongo-cuckoo; forest butterflies such as the Singapore fourline blue and Grand imperial; mammals like the Sunda pangolin, which is particularly vulnerable to roadkill during forest-to-forest movement, and reptiles such as snake species.

No Change is expected for the remaining 20 species that do not require connected habitats for dispersal and are capable of traversing urban infrastructure. These include the Long-tailed macaque, Smooth-coated otter, urban-adapted or migratory bird species, and a few butterfly species that utilise scrubland and streetscapes.

4.4.5.3.3 Accidental Injury or Mortality

Accidental injury or mortality may arise from construction activities, such as collisions with machinery, entrapments in construction materials (e.g., non-biodegradable erosion control blankets) and structures (such as exposed pits or drains).

Major Negative impact is expected for two species of Bamboo bats, which roost in bamboo nodes and are highly susceptible to injury and mortality during bamboo clearance. **Moderate Negative** impact is expected for 10 species, including snakes, mammals such as Sunda pangolin and Smooth-coated otter, and ground-dwelling birds such as crakes. These species are susceptible to injury as they are ground-dwelling and inhabit dense ground vegetation and grasses. As a result, they tend to be less visible to machinery operator and are less likely to disperse quickly from clearing activities compared to more mobile and/or volant fauna.

Minor Negative impact is expected for 34 bird species, and **No Change** is expected for the one odonate and 36 butterfly species, as their flight capability allows them to readily disperse and therefore experience lower risk of mortality and injury during construction.

4.4.5.3.4 Light Disturbance

The increase in light levels from construction activities may cause disturbance to wildlife. **Moderate Negative** impact is expected for 46 species, including nocturnal animals such as bats, herpetofauna, and mammals, which are highly sensitive to artificial lighting which can disrupt their foraging and navigation behaviours. Birds are also affected due to their sensitivity to light, which can disrupt their roosting behaviour.

Minor Negative impact is expected for one odonate and 36 butterfly species.