APPENDIX B.
BIODIVERSITY CHECKLIST

The Biodiversity Checklist summarizes the design actions within each module and application for separate biodiversity management and land use categories. Management categories are broadly defined as areas within Sensitive Ecosystem Development Permit Areas (SEDPA), which includes the Green Infrastructure Network and watercourses, and the urban matrix, which includes all lands outside of the GIN.

The Biodiversity Design Guidelines are intended for use across Surrey's landscape, with an initial focus on internal rollout (City lands). The City may consider additional strategies in the future to increase uptake of the Biodiversity Design Guidelines on private land. For example, incentivizing or requiring the use of the BDGs during the development permitting process. The City of Seattle Green Factor (SGF) could serve as a model for this type of initiative. The SGF is a score-based code (i.e., bylaw) requirement that increases the amount and improves the quality of landscaping in a new development, while also recognizing associated co-benefits (e.g., reduction of stormwater runoff). A minimum score must be achieved depending on the zoning of the property; however, the score can be achieved by selecting from a variety of different landscaping options (e.g., green roofs, native plants, etc.), with each option having a different credit depending on different factors such as area covered. Similarly, credits could be attached to specific biodiversity design guideline actions, with the aim of reaching specific biodiversity targets within a neighbourhood or planning area.

Additional information on the Seattle Green Factor can be found here.

Action	SEDPA		Urban Matrix				
	GIN	Streams (includes riparian area)	Parks	Single Family Residential	Multi-Family Residential	Commercial/ Industrial	Agricultural
Habitat Structures (Module 1)							
Nest box	x	x	x	x	x	x	x
Nest platform	x	x	x		x	x	x
Raptor perch	x	x	x			x	x
Bat box	x	x	x	x	x	x	x
Insect hotel			x	x	x	x	x
Wildlife tree	x	x	x	x	x	x	x
Downed wood	x	x	x	x	x	x	x
Brush/leaf pile	x	x	x	x	x	x	x
Exposed soil/sand piles	x	x	x	x		x	x
Riprap	x	x	x				x
Artificial hibernacula	x	x	x	x	x	x	x
Vernal Pool	x	x	x	x	x	x	x
Large wood	x	x					
Artificial ponds and water features			x	x	x	x	x
Bird bath			x	x	x	x	x
Bird feeder				x	x	x	x
Cat enclosure				x	x		x
Pollinator Garden			x	x	x	x	x
Light and Noise (Module 2)							
Bird-friendly lighting	x	x	x	x	x	x	x
Natural darkness	x	x	x	x	x	x	x
Directional and shielded lighting	x		x	x	x	x	x
Low mounted lighting	x		x	x	x	x	x
Vegetative Buffers	x	x	x	x	x	x	x
Earth berms			x	x	x	x	x
Low-height barriers			x	x	x	x	x
Artificial barriers	x		x	x	x	x	x
Road Ecology (Module 3)							
	x	x	x	x	x	x	x
One-way gates	x						
Wildlife crosswalks	x		x	x	x	x	x
Wildlife curbs	x		x	x	x	x	x
Diversionary Structures	x		x	x	x	x	x
Speed bumps	x		x	x	x	x	x
Signage	x		x	x	x	x	x
Medians	x		x		x		

Action	SEDPA		Urban Matrix				
	GIN	Streams (includes riparian area)	Parks	Single Family Residential	Multi-Family Residential	Commercial/Industrial	Agricultural
Speed reductions	x		x	x	x	x	x
Underpass (small)	x	x	x	x	x	x	x
Underpass (large)	x	x					
Underpass (multi-use)	x	x	x	x	x	x	x
Culvert (terrestrial)	x		x	x	x	x	x
Culvert (aquatic)	x	x	x	x	x	x	x
Underpass (aquatic)	X	x					
Canopy crossing	x						
Landscape bridge	X						
Drainage (Module 4)							
Constructed wetland			x		x	x	x
Wet detention pond					x	x	x
Biopond			x		x	x	x
Bioswale			x	x	x	x	x
Rain garden			x	x	x	x	
Absorbent landscapes			x	x	x	x	
Soil cells			x	x	x	x	
Green Roofs & Walls (Module 5)							
Intensive green roof			x		x	x	
Extensive green roof			x	x	x	x	
Vegetated mat			x	x	x	x	
Green facade			x	x	x	x	
Living wall			x	x	x	x	
Green retaining wall			x	x	x	x	x

Action	SEDPA		Urban Matrix				
	GIN	Streams (includes riparian area)	Parks	Single Family Residential	Multi-Family Residential	Commercial/ Industrial	Agricultural
Maintained Landscaping (Module 6)							
Narrow medians	x		x	x	x	x	
Wide Medians	x				x	x	
Boulevards	x		x	x	x	x	
Edge Interfaces	x			x	x	x	x
Utility Corridors	x		x		x	x	x
Trails (Module 7)							
Trail surfacing	x		x		x	x	
Foot bridges	x	x	x				
Elevated boardwalks	x	x	x				
Signage (Module 8)							
Interpretive signs	x	x	x	x	x	x	x
Standard warning sign	x		x		x	x	x
Enhanced warning sign	x		x			x	x
Temporal warning sign	x		x	x	x	x	x
Animal detection system	x		x		x	x	x

APPENDIX C.

This section includes a summary of important linkages between the Biodiversity Design Guidelines and the Biodiversity Conservation Strategy (BCS) such as species groupings, focal species and habitat types. Linkages between modules and species groupings are highlighted to emphasize important interrelationships.

SPECIES GROUPINGS AND BDG MODULES

Species Groupings	BDG Modules							
	Habitat Structures	Light and Noise	Road Ecology	Drainage	Green Roofs/Walls	Maintained Landscaping	Trails	Signage
Birds	x	x	x	x	x	x	x	x
Aerial Insectivores	x	x	x	x	x	x		
Raptors	x	x	x	x		x		x
Wetland Birds (e.g., bitterns, cranes, rails)		x	x	x				x
Seabirds (e.g., cormorants, gulls, terns)				x	x	x		
Shorebirds (e.g., sandpipers, plovers, oystercatcher, yellowlegs, killdeer)		x		x	x	x		x
Songbirds	x	x	x	x	x	x	x	
Wading Birds (e.g., herons, night-herons)		x	x	x				x
Waterfowl (e.g., coots, ducks, geese, grebes, loons, swans)	x	x	x	x		x	x	x
Woodpeckers/Sapsuckers	x	x				x		x
Mammals	x	x	x	x		x	x	x
Medium to Large Mammals		x	x	x		x	x	x
Semi-aquatic Mammals		x	x	x				
Small Mammals	x	x	x	x	x	x	x	
Bats	x	x	x	x	x	x	x	x
	x							
Herptiles (Reptiles/Amphibians)	x	x	x	x		x	x	x
Fish	x	x	x	x			x	x
Invertebrates	x	x		x	x	x		x
Aquatic Invertebrates	x	x		x				x
Terrestrial Invertebrates	x	x	x	x	x	x	x	x
Plants	x		x	x	x	x	x	x
Aquatic Plants	x		x	x		x	x	
Coastal Plants (e.g., estuary, beach)	x	x		x			x	x
Terrestrial Plants	x	x	x	x	x	x	x	x

SPECIES GROUPINGS AND HABITAT TYPES

Species Groupings	General Habitat Types	BCS Habitat Types
Birds		
Aerial Insectivores	Field (Open); Forest; Riparian	Herb and Shrub; Young deciduous forest; Young mixed forest; Young evergreen forest; Mature forest; Old growth forest;
Raptors	Field (Open); Forest: Riparian	Herb and Shrub; Young mixed forest; Young evergreen forest; Mature forest; Old growth forest; Riparian
Wetland Birds(e.g., bitterns, rails)	Wetland	Wetland marsh; wetland bog; Riparian
Seabirds (e.g., cormorants, gulls, terns)	Marine – Estuarine	Marine intertidal/estuarine marsh
Shorebirds (e.g., sandpipers, plovers, oystercatcher, yellowlegs, killdeer)	Marine – Estuarine	Marine intertidal/estuarine marsh
Songbirds	Field (Open); Forest; Riparian	Young deciduous forest; Young mixed forest; Young evergreen forest; Mature forest; Old growth forest; Wetland marsh; wetland bog
Wading Birds (e.g., herons, night-herons)	Wetland; Rivers and Lakes	Wetland marsh; Wetland bog; Lakes, ponds and ditch; River; Riparian
Waterfowl (e.g., coots, ducks, geese, grebes, loons, swans)	Wetland; Rivers and Lakes	Wetland marsh; Wetland bog; Lakes, ponds and ditch; River; Riparian
Woodpeckers/Sapsuckers	Forest (mature)	Mature forest; Old growth forest
Mammals		
Medium to Large Mammals	Field (Open); Forest; Wetland; Riparian	Herb and Shrub; Young deciduous forest; Young mixed forest; Young evergreen forest; Mature forest; Old growth forest; Wetland marsh; Wetland bog; Riparian
Semi-aquatic Mammals	Wetland; Rivers and Lakes; Riparian	Wetland marsh; wetland bog; Lakes, ponds and ditch; River; Riparian
Small Mammals	Field (Open); Forest; Wetland	Herb and Shrub; Young deciduous forest; Young mixed forest; Young evergreen forest; Mature forest; Old growth forest; Wetland marsh; wetland bog
Bats	Field (Open); Forest; Wetland	Herb and Shrub; Wetland marsh; wetland bog; Mature forest; Old growth forest

Species Groupings	General Habitat Types	BCS Habitat Types
Herptiles (Reptiles/Amphibians)	Field (Open); Forest; Wetland; Rivers and Lakes	Herb and Shrub; Young deciduous forest; Young mixed forest; Young evergreen forest; Mature forest; Old growth forest; Wetland marsh; wetland bog; Lakes, ponds and ditch; River; Riparian
Fish	Wetland; Rivers and Lakes; Riparian	Wetland marsh; wetland bog; Lakes, ponds and ditch; River; Riparian
Invertebrates		
Aquatic Invertebrates	Wetland; Rivers and Lakes	Wetland marsh; wetland bog; Lakes, ponds and ditch; River
Terrestrial Invertebrates	Field (Open); Forest; Riparian	Herb and Shrub; Young deciduous forest; Young mixed forest; Young evergreen forest; Mature forest; Old growth forest
Plants		
Aquatic Plants	Wetland; Rivers and Lakes	Wetland marsh; wetland bog; Lakes, ponds and ditch; River
Coastal Plants (e.g., estuary, beach)	Marine – Estuarine	Marine intertidal/estuarine marsh
Terrestrial Plants	Field (Open); Forest	Herb and Shrub; Young deciduous forest; Young mixed forest; Young evergreen forest; Mature forest; Old growth forest

SPECIES GROUPINGS AND FOCAL SPECIES

Species Groups/Indicator Species/SCC Species/Additional Focal Species

Species Grouping	BCS Indicator Species	Species of Conservation Concern	Additional Focal Species
Birds			
Aerial Insectivores		Barn Swallow	Vaux's Swift
Raptors	Red-tailed Hawk	Barn Owl Short-eared Owl	Accipiter spp. (Cooper's Hawk) Bald Eagle Great Horned Owl Gyrfalcon Northern Harrier Peregrine Falcon
Wetland Birds		American Bittern	Sora
Seabirds		Double-crested Cormorant	Bonaparte's Gull California Gull
Shorebirds		American Avocet	Greater Yellowlegs
Songbirds	Common Yellowthroat Dark-eyed Junco Pacific-slope Flycatcher Song Sparrow Spotted Towhee Swainson's Thrush Warbling Vireo Willow Flycatcher Yellow Warbler		American Robin Black-capped Chickadee Brown Creeper House Finch Lincoln's Sparrow Pacific Wren Red-eyed Vireo Savannah Sparrow Warbling Vireo Western Meadowlark
Wading Birds		Great Blue *Heron faninni ssp.* Green Heron	
Waterfowl	Hooded Merganser		Canada Goose Common Goldeneye Mallard Trumpeter Swan
Woodpeckers/Sapsuckers	Downy Woodpecker Northern Flicker		Pileated Woodpecker Red-breasted Sapsucker
Other		Band-tailed Pigeon	Belted Kingfisher Northwestern Crow

Species Grouping	BCS Indicator Species	Species of Conservation Concern	Additional Focal Species
Mammals			
Medium to Large Mammals	Black-tailed Deer		Bobcat Raccoon Striped Skunk
Semi-aquatic Mammals	Muskrat	Pacific Water Shrew (SCC)	Mink River Otter
Small Mammals	Douglas Squirrel Townsend's Vole		Humboldt's Flying Squirrel Long-tailed weasel, altifrontalis subspecies Shrew Mole Trowbridge's Shrew Vagrant Shrew
Bats			
Herptiles (Reptiles/Amphibians)	Northern Red-legged Frog Long-toed Salamander Northwestern Salamander Northern Pacific Treefrog	Northern Red-legged Frog Painted Turtle Western Toad	Garter Snake spp.
Fish	Coastal Cutthroat Trout Coho Salmon		Salish Sucker Western brook Lamprey Redside Shiner
Invertebrates			
Aquatic Invertebrates	Dragonflies		Stoneflies/Caddisflies
Terrestrial Invertebrates	Butterflies & Moths	Oregon Forestsnail Pacific Sideband	Bees, wasps and allies Beetles (e.g., ground, lady, meshwing) Gastropods (e.g., Northwest Hesperian, , Banana Slug)
Plants			

Species Grouping	BCS Indicator Species	Species of Conservation Concern	Additional Focal Species
Aquatic Plants			Slender Spike-rush Wapato Yellow Pond-lily Skunk Cabbage
Coastal Plants (e.g., estuary, beach)			Lyngbye's Sedge Silver burweed
Terrestrial Plants			Cooley's Hedgenettle Douglas Aster Nodding Onion Pacific Yew Red Columbine Red Huckleberry Western Trillium