



September 30, 2013

Project No: 13-1126

New Monaco Enterprise Corp.
340 Machleary Street
Nanaimo, BC V9R 2G9

Subject: Biophysical Inventory and Environmental Sensitivity Analysis Update for the Proposed New Monaco Resort Development, Peachland, BC

1.0 INTRODUCTION

Ecoscape Environmental Consultants Ltd. (Ecoscape) has been retained by New Monaco Enterprise Corporation (New Monaco) to update and refine the biophysical inventories and Environmental Sensitivity Analysis (ESA) for a proposed resort development within an approximately 50.5 ha property at 3599 Highway 97 South, in Peachland, BC (Property). The refined analysis and mapping was used to provide recommendations and mitigation strategies for the development. The Property is generally characterized by open coniferous woodland and grassland communities that provide habitat for a number of wildlife species. Inventories focused on potentially occurring at risk or endangered species and identified sensitive ecosystems. This letter report is an addendum to the environmental assessment previously completed by Ecoscape in 2007 to provide direction and guidance to the development planning and site specific mitigation to reduce or eliminate potential impacts.

2.0 PURPOSE AND OBJECTIVES

This letter report is meant to address previously identified gaps in the original assessment and to refine the biophysical inventories, given the proposed resort development. As such, the work addressed the following objectives:

- Conduct refined biophysical inventories with a focus on at risk bird species, rare ecosystems, and other sensitive features;
- Address potential issues related to connectivity of the Property in relation to adjacent, undeveloped lands, with particular focus on avian species; and
- Provide ecological land use planning concepts and recommendations to integrate into the resort development plan.



3.0 BIOPHYSICAL INVENTORY

Field inventories were completed in spring of 2013 to build upon previous inventories completed in 2007 and to address potential data gaps associated with the development plans. The inventories were also used to confirm and refine ecosystem classification and the presence of at risk species and rare, unique, or critical habitats.

3.1 Birds

Bird surveys were conducted using stratified, unlimited radius point counts with other incidental species detections recorded as observed. Surveys were conducted in the early morning to coincide with dawn chorus and to maximize the number of potential species detections. Surveys specific to raptors, owls, and waterfowl were not completed. The following bird species list should not be considered exhaustive and may not include all of the potential species that utilize habitats within the Property regularly or seasonally. As such, the lack of wildlife detections is not necessarily indicative of absence of the species.

Surveys were conducted on June 11 and 13, 2013. During the avian surveys, 41 different species were observed. Other incidental observations during previous assessments have been included in a complete list of occurrence records to date (Table 1). Each species' provincial status and general habitat association has been included for reference.



Table 3. Summary of bird species and habitat associations within the Property.

Common Name	Latin Name	BC Status ¹	COSEWIC Listing ²	Habitat Association
American goldfinch	<i>Carduelis tristis</i>			All Types
American robin	<i>Turdus migratorius</i>			All Types
black-billed magpie	<i>Pica pica</i>			All Types
black-headed grosbeak	<i>Pheucticus melanocephalus</i>			Broadleaf/Riparian
Bullock's oriole	<i>Icterus bullockii</i>			All Types
brown-headed cowbird	<i>Molothrus ater</i>			All Types
California quail	<i>Callipepla californica</i>			All Types
Cassin's finch	<i>Carpodacus cassinii</i>			Coniferous Forest
cedar waxwing	<i>Bombycilla cedrorum</i>			Coniferous Forest
chipping sparrow	<i>Spizella passerina</i>			Forest/Shrubland
Clark's nutcracker	<i>Nucifraga columbiana</i>			Forest/Shrubland
common nighthawk	<i>Chordeiles minor</i>		T (Apr 2007)	Shrubland/Grassland
common raven	<i>Corvus corax</i>			All Types
eastern kingbird	<i>Tyrannus tyrannus</i>			Shrubland/Grassland
evening grosbeak	<i>Coccothraustes vespertinus</i>			Broadleaf/Riparian
hairy woodpecker	<i>Picoides villosus</i>			Coniferous Forest
Hammond's flycatcher	<i>Empidonax hammondii</i>			Coniferous Forest
house finch	<i>Carpodacus mexicanus</i>			Rural
house wren	<i>Troglodytes aedon</i>			Mixed Forest
mourning dove	<i>Zenaida macroura</i>			Rural
Nashville warbler	<i>Vermivora ruficapilla</i>			Broadleaf/Riparian
northern flicker	<i>Colaptes auratus</i>			Mixed Forest
northern rough-winged swallow	<i>Stelgidopteryx serripennis</i>			Forest/Shrubland
osprey	<i>Pandion haliaetus</i>			Mixed Forest/Lake
pine siskin	<i>Carduelis pinus</i>			Coniferous Forest
pygmy nuthatch	<i>Sitta pygmaea</i>			Coniferous Forest
red crossbill	<i>Loxia curvirostra</i>			Coniferous Forest
red-tailed hawk	<i>Buteo jamaicensis</i>			Forest/Shrubland
rock wren	<i>Salpinctes obsoletus</i>			Rock Outcrop/Cliff
rufous hummingbird	<i>Selasphorus rufus</i>			Mixed Forest
Say's phoebe	<i>Sayornis saya</i>			Shrubland/Grassland
spotted towhee	<i>Pipilo maculatus</i>			Broadleaf/Riparian
Townsend's solitaire	<i>Myadestes townsendi</i>			Coniferous Forest
violet-green swallow	<i>Tachycineta thalassina</i>			Forest/Shrubland
warbling vireo	<i>Vireo gilvus</i>			Broadleaf/Riparian
western bluebird	<i>Sialia mexicanus</i>			Shrubland/Grassland
western tanager	<i>Piranga ludoviciana</i>			Coniferous Forest
western wood-pewee	<i>Contopus sordidulus</i>			Coniferous Forest
white-breasted nuthatch	<i>Sitta carolinensis</i>			Coniferous Forest
Wilson's warbler	<i>Wilsonia pusilla</i>			Broadleaf/Riparian
yellow-rumped warbler	<i>Dendroica coronata</i>			Mixed Forest

¹ Source: <http://www.env.gov.bc.ca/cdc/>. Blue: Of special concern. ² Source: <http://www.cosewic.gc.ca/>

3.2 Environmentally Sensitive Areas

Environmentally Sensitive Area (ESA) analyses were completed during the previous environmental studies. The original ESA ratings were determined by Ecoscape (2007) with adjustments made in 2011 to reflect the results of follow-up surveys. At that time, it was recommended that Polygon 18 be changed from 'High' to 'Moderate' environmental sensitivity.



This was due to the findings that rock outcrop habitats previously identified were determined to be marginally suitable for reptile denning and overwintering.

The 'Very High' ESA are associated with the Drought Creek corridor and other riparian and ravine communities (Polygons 3, 6, 7, and 16). Adjacent young to mature ponderosa pine communities received a High rating reflected by the watercourse, associated riparian communities, and mature pine woodland. Other areas considered to have 'High' sensitivity ratings include mature ponderosa pine woodland, sparsely vegetated ecosystems (cliffs, bedrock outcrops, and talus) and riparian and broadleaf sites.

Moderately sensitive areas include young woodland stands with intermittent clearings and adjacent disturbance from agricultural or other rural activities. Low value sites are generally characterized by anthropogenic influence (e.g., hay fields and orchards).

4.0 ENVIRONMENTAL CONSIDERATIONS

Important environmental considerations to maintain ecological integrity, protect at risk wildlife and conserve sensitive ecosystems are described below.

4.1 Wildlife

At risk bird species observed within the Property were limited to common nighthawk, which was observed after flushing from the ground. Evidence of nesting could not be found and the bird observed did not return to the site during the assessment. Ecosystems occurring throughout the Property provide suitable breeding habitat for a number of sensitive species, including flammulated owl (*Otus flammeolus*), Lewis's woodpecker (*Melanerpes lewis*), and olive-sided flycatcher (*Contopus cooperi*), among others. The preservation of the Very High ESA value areas and other key habitat features such as veteran trees and snags, will help maintain habitat quality for these species. Other mitigation measures and best management practices related to bird species are described below.

4.2 Habitat Fragmentation

Habitat fragmentation as a result of development affects numerous ecological processes across multiple spatial and temporal scales, including changes in abiotic regimes, shifts in habitat use, altered population dynamics of species, and changes in species compositions (Bond *et al.* 2003). Fragmentation of habitats can ultimately result in displacement or the local extirpation (i.e., extinction at a local scale) of species. The Property is currently in a fragmented state as a result of highways and other developments that interrupt the connectivity with adjacent natural lands. However, the Property may still provide 'stepping stone' habitat for species between the lake and upland habitats north of the Property.



4.3 Habitat Loss

The loss of rare, sensitive, and at risk habitats from construction activities must be carefully considered prior to development. Habitat loss has a cumulative effect on wildlife species and ecological communities which may lead to negative effects to identified species at risk. Within the Property this includes the riparian corridor associated with Drought Creek and adjacent ecosystems.

4.4 Wildlife Mortality

Construction activities have the potential to cause direct harm to wildlife. In particular, small wildlife species that are less motile or that tend to seek refuge in snags, coarse woody debris, or within rock outcrops, talus, or other natural debris, are vulnerable as they are less likely to vacate the property prior to construction activities taking place. All wildlife, including bird and small mammal nests that occur along the ground, in live and dead trees, or within rock crevices, are protected by the provincial *Wildlife Act* and federal *Migratory Birds Convention Act*. Raptor and heron nests that are used over numerous breeding seasons are protected whether they are active or not.

4.5 Wildlife Disturbance and Displacement

The noise, vibrations, and pollution associated with construction activities have the potential to disrupt important wildlife activities including migrating, foraging, and breeding. Timing and proximity to environmentally sensitive areas that are more likely to support sensitive species are important considerations to reduce impacts to wildlife during both the construction and occupation stages of the development.

5.0 RECOMMENDATIONS AND MITIGATION

The Property represents a patch of moderate to high-value woodland and grassland habitats that are becoming increasingly rare in the Okanagan. In spite of the anthropogenic disturbances, it is important to retain connectivity and the current level of ecological integrity to conserve the inherent values for wildlife and people alike. Management considerations and mitigation measures are described below:

5.1 Conservation and Connectivity

The Property represents a large expanse of mixed woodland and grassland with old field and rural habitats. There are several sensitive ecosystems within the Property that provide habitat for similarly rare species and these features should be considered during the resort planning and development to sustain representative biodiversity and ecological communities. Other management considerations are described below



- Corridors and linkages were previously identified to maintain connectivity between upland areas and the lake. Currently, a 2 m diameter corrugated steel pipe culvert provides access to the Property from natural lands across the Highway 97C right of way. However, there is no designated crossing at Highway 97. If possible, the existing corridor linkages should be maintained or enhanced to allow wildlife to move and disperse unimpeded and to prevent isolation and fragmentation of habitats.
- Maintaining the integrity and connectivity of the Very High ESA value habitats should be a priority. These communities are highly sensitive to disturbance and provide critical habitat for a number of at risk wildlife species. In general, the retention target in these areas is 100% (i.e., no development). In order to protect the identified Very High ESA areas, development and access must be avoided or appropriately mitigated. Where construction and development are proposed in association with these areas (e.g., road crossings), site specific mitigation measures should be implemented to address potential impacts.
- The design and construction of retaining walls should avoid encroachment of High value or sensitive ecosystems, such as the Drought Creek corridor (Polygon 16). If encroachment on these areas does occur, compensation should be undertaken elsewhere within the Property at a 1:1 ratio. Compensation may be undertaken in the form of enhancement or restoration of existing degraded areas (e.g., weeding, planting, cleaning of litter or debris) or construction of new suitable habitats such as wetlands (described below).
- Wetland features should be integrated into the development designs at an early stage. The locations and complexities of the constructed wetlands will provide compensation for the development footprint, provide stormwater retention, as well as wildlife habitat and 'stepping stones' for migration. Wetlands should also incorporate a diversity of suitable aquatic or hydrophilic plant species that are native to the region and suitable for local conditions.
- Landscape designs should integrate 'bird friendly' concepts, including using native tree and shrub species that provide forage, perching, nesting, and/or refuge. A diversity of species that are suitable for the climate, topography, soils, and ecology should be incorporated into the plans. Additional information is available at:
http://www.massaudubon.org/Nature_Connection/wildlife/index.php?subject=Birds:%20Attracting&id=11



5.2 Wildlife

Recommendations pertaining to wildlife are generally related to conservation of wildlife species documented to occur within the Property, their associated habitats, and planning considerations for the proposed development.

- If clearing activities are conducted during the identified avian nesting period (i.e., March 15 to August 15), pre-clearing surveys should be conducted by a qualified environmental professional (QEP) to identify critical habitat features, nests, burrows, dens, etc. Surveys should also focus on raptor and heron nests, stick nests, and snags and cavities that may be used over multiple years or year-round (i.e., winter resident and hibernating species). Section 34 of the *Wildlife Act* protects all birds and their eggs, and Section 34 (c) protects their nests while they are occupied by a bird or egg.
- If raptor and heron nests are identified during planning and development, provincial Best Management Practices should be followed to buffer the nest site and prevent disturbance, whether the nest is active or not. Other identified critical perching or roosting habitat features should also be protected with established buffers.
- Avoidance of cliff and talus habitat will help protect important nesting areas for sensitive and at risk bird species potentially occurring within the Property, such as swifts, swallows, and wrens.
- Domestic cats are known to have significant negative effects on resident bird populations. Cats and other domestic animals have the potential to harass and prey upon native wildlife, as well as transmit disease and compete for other resources. Cats may also impact other sensitive species including small mammals, amphibians, and invertebrates. Future residents should be educated about the potentially harmful effects cats may have on native wildlife populations.
- Surveys for bats have not been conducted. However, the suitable roosting and hibernacula habitat (e.g., cliff, talus, and rock outcrop) as well as suitable foraging areas should be considered during development planning.
- In general, the development planning should attempt to avoid rock outcrops, talus, cliffs, and other rocky and sparsely vegetated sites that are suitable for important life history stages for the sensitive species. Coarse woody debris and large rocks should be conserved where possible. Wetland, riparian, and other aquatic habitats should be avoided to conserve the critical habitat they provide to reptile and amphibian species.
- The development design should incorporate, where feasible, exclusion fencing (e.g., drift fence) or customized crossings (e.g., box culverts, bridges) at key corridors and



habitat linkages where road crossings may lead to wildlife mortalities or reduced migration potential.

5.3 Vegetation and Soils

Protection of existing ecosystems, including vegetation and soils, is generally much more efficient than ecosystem enhancement and restoration following construction. The following mitigation measures are meant to protect natural ecosystems and reduce the need for restoration.

- Veteran trees and snags are scattered throughout the Property. These trees should be conserved where possible for the important nesting, denning, and perching habitat features they provide. The retention of snags must be conducted with public safety in mind. Fallen trees and other coarse woody debris should also be retained where possible for the important habitat and nutrients they provide to the forest ecosystems.
- Topsoil removed or disturbed during construction activities should be stockpiled to be used in restoration areas elsewhere within the Property. Similarly, live vegetation occurring within areas planned for construction or other disturbance should be salvaged where possible for restoration areas. In general, the development design should attempt to minimize the overall footprint to the greatest extent possible. Cuts and fills, compaction, and other impermeable surfaces should be minimized.
- Impacts from invasive species include the displacement or competitive exclusion of native species. Prevention of the establishment of non-native weeds can be achieved by limiting disturbance to soils and native vegetation where possible. Areas that have previously been disturbed should be restored with native plantings or grass seeding. Existing infestations of noxious weeds should be monitored and controlled with regular manual removal of weeds (e.g., mowing, pulling).
- Exposed soils should be seeded and mulched immediately following any activities the result in disturbance to native vegetation. Grass seed mixes should be comprised of native species, appropriate for the environmental conditions, and certified as Canada #1 Grade by Agriculture Canada to minimize the weed seed count.



6.0 CLOSURE

This addendum letter has been prepared for the exclusive use of New Monaco Enterprise Corporation and associated subcontractors for the proposed New Monaco resort development in Peachland, BC. Ecoscape has prepared this letter with the understanding that all available information on the proposed works has been disclosed. New Monaco Enterprise Corporation has acknowledged that in order for Ecoscape to properly provide the professional service, Ecoscape is relying upon full disclosure and accuracy of this information.

If you have any questions or comments, please contact the undersigned at your convenience.

Respectfully Submitted,
ECOSCAPE Environmental Consultants Ltd.

Adam Patterson, B.Sc.
Natural Resource Biologist
Direct line: 250-491-7337 ex. 207

Kyle Hawes, B.Sc., R.P.Bio.
Natural Resource Biologist
Direct line: 250-491-7337 ex. 203

