

Public Works and Government Services Canada

Burlington Canal Life Bridge

Peregrine Falcon Management Plan

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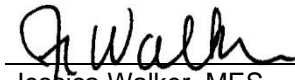
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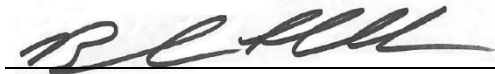
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Appendices

Appendix A. Peregrine Falcon Safety Plan

1. Introduction

AECOM Canada Ltd. (AECOM) has been retained by Public Works and Government Services Canada (PWGSC) to update the 2007 Peregrine Falcon Management Plan updated in 2019, to improve the overall safe operations at the Burlington Canal Life Bridge (BCLB) for current or future undertakings by PWGSC staff or associated contractors in consideration of the species' current status under applicable legislation.

1.1 Conservation

North American Peregrine Falcon populations suffered dramatic declines in the 1950s through 1970s from eggshell thinning and resulting reproductive failure caused by bioaccumulation of organochlorine pesticides, particularly dichlorodiphenyltrichloroethane (DDT) (COSEWIC, 2007). By the mid 1960s, Peregrine Falcons were considered extirpated from Ontario (OPFRT, 2010). Restrictions imposed on the use of DDT in North America in the early 1970s and reintroduction/release programs of captive-raised birds allowed Peregrine Falcon populations to recover to near historical (pre-DDT) numbers in most regions of Canada (COSEWIC, 2007).

Environmental contaminants remain a threat to Peregrine Falcon recovery as DDT is still used in other parts of the world including some of their migratory and overwintering grounds range (i.e., South and Central America) (COSEWIC, 2007). Furthermore, other chemicals may negatively affect Peregrine Falcons (e.g., a class of flame retardants, polybrominated diphenyl ethers [PBDEs] that bioaccumulates in birds, ingestion of prey contaminated with pesticides used for the control of pigeons, starlings and house sparrows in urban centres) (OPFRT, 2010; COSEWIC, 2007). Other threats include but are not limited to human disturbance at or near the nest site due to construction, recreational activities (rock climbing), etc.; collisions with buildings, vehicles, etc.; and capture for falconry (OPFRT, 2010).

1.2 Legislative Protection

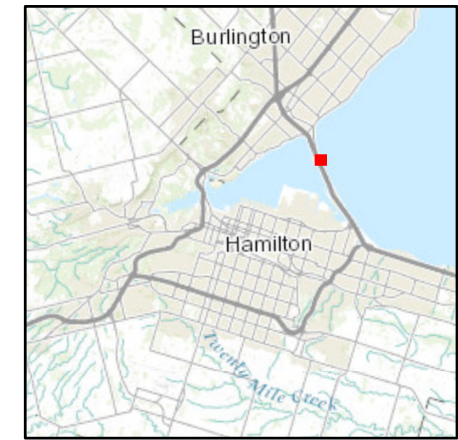
Canada's Species at Risk Act, 2002 (SARA) protects and provides recovery strategies for Species at Risk (SAR) listed as Extirpated, Endangered or Threatened species under Schedule 1. This legislation applies to federal lands, federally regulated projects, or SAR birds receiving protection under Canada's *Migratory Birds Convention Act, 1994* (MBCA)¹. Species that are listed as Special Concern under Schedule 1 of the SARA receive management initiatives under SARA to prevent them from becoming Endangered and Threatened, but do not receive individual or habitat protection. At the time the Peregrine Falcon Management Plan (Chan, 2019) was prepared in 2007, the species was listed as Threatened under Schedule 1 of the SARA. Peregrine Falcon (*Falco peregrinus anatum*) was reassessed in June 2012 and down-listed to Special Concern under Schedule 1 of the SARA. Note that the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), recommends species designations under Schedule 1 of the SARA and no longer considers Peregrine Falcons at risk. The species is also designated as Special Concern under Ontario's *Endangered Species Act, 2007* (ESA). As a specially protected raptor, Peregrine Falcon and their nests and eggs, receives protection under Ontario's *Fish and Wildlife Conservation Act, 1997* (FWCA), administered by the Ontario Ministry of Natural Resources and Forestry (MNRF). Peregrine Falcons cannot be hunted or trapped and it is prohibited to destroy, take or possess their nest or eggs unless authorized by the MNRF.

¹ Peregrine Falcons are under provincial jurisdiction and do not receive protection under the federal MBCA.

1.3 Bridge History and Operations

The BCLB, owned and operated by PWGSC, is located at 1157 Beach Boulevard at the intersection of Eastport Drive / Provincial Highway 20 in Hamilton, Ontario (**Figure 1**). The BCLB spans the Burlington Canal that connects Hamilton Harbour with Lake Ontario as a navigable access to the Atlantic Ocean. The present bridge was opened in 1962 and carried two lanes of vehicular traffic and rail across the canal until the rail line was closed and the deck was widened to four lanes for vehicles in 1982, which provided increased local capacity for traffic to cross the canal and an alternative to the Burlington Skyway / Queen Elizabeth Way (QEW) located approximately 140 m to the southwest (Chan, 2019).

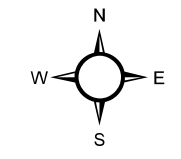
The bridge consists of two towers and a moveable bridge (lift span) that allows passage to large ships (on-demand) and pleasure crafts (every half to one hour) during the navigation season from mid March to late December (Chan, 2019). The lift span is 115 m (380 feet) long, weighs 2200 tons and has a vertical lift of 33.5 m (110 feet). Both towers contain machinery, sheaves and wire ropes that are used to move the lift span.



Key Map

Legend

- Roads
- ★ Peregrine Falcon Nest Box Location



1:1,500
 NAD 1983 UTM Zone 17N
 60 30 0
 Meters

Basemap:
 Additional Sources:
 Ortho-Imagery:
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2. Peregrine Falcon Life History and Conservation

The Peregrine Falcon is widely distributed across the globe (White *et al.*, 2020). It is a crow-sized raptor, with long pointed wings and long narrow tail, that feeds mostly on smaller birds that are caught in the air, typically by diving or stooping from a perch that provides a high vantage point (Cornell University, 2019; White *et al.*, 2020). Adults are blue gray above with white breast and barred belly while juveniles are brown and heavily streaked (OPFRT, 2010). The species dark head and thick “sideburns” gives the adults a distinctive hooded or “helmeted” appearance. Peregrine falcon is mostly migratory at northern latitudes; however, some populations remain sedentary, particularly in urban areas and/or where prey is adequate during the winter months (White *et al.*, 2020).

The following sections provide a general overview of Peregrine Falcon life history, focusing on information relevant to the BCLB.

2.1 Breeding Ecology

Nesting habitat includes steep to vertical natural cliff faces with ledges or ledges on human-made structures (e.g., tall buildings, bridges) (OPFRT, 2010). Peregrines Falcons in southern Ontario mostly nest in urban habitats; nest on natural cliffs typically occur in remote areas (OPFRT, 2010). In Ontario, the average height of urban nests is between 9 and 52 m, with most being 11 to 23 m above the ground (OPFRT, 2010).

Peregrine Falcons typically form monogamous pair bonds and return to the same or another nearby suitable nesting ledge over multiple breeding seasons (OPFRT, 2010). Nests consist of “scrapes” or simple small depressions that the bird digs into sand, fine gravel or dirt (OPFRT, 2010). The breeding season begins with courtship and scraping in late February or early March. In southern Ontario, Peregrine Falcon begin laying eggs in mid- to late March (OPFRT, 2010). Incubation lasts about 33 days and nestlings hatch around late April in southern Ontario (OPFRT, 2010). Young fledge between late May and mid-July, approximately 35 to 42 days after hatching (OPFRT, 2010). Peregrine Falcons raise only one brood per season but will re-nest if eggs are lost (e.g., damaged) or if the chicks die shortly after hatch (White *et al.*, 2020).

2.2 Defensive Behaviour

Peregrine Falcons exhibit aggressive/defensive behaviour when a threat is perceived. Peregrine Falcons and other birds are more likely to respond aggressively during the nesting season to ward off potential predators from its nest (Chan, 2019; USFWS, no date). Peregrine Falcon nesting territories (i.e., the area around the nest site that the pair defends) vary in size (OPFRT, 2010). Furthermore, the degree of vigor of a Peregrine Falcon’s attack depends on the stage of the breeding cycle and the individual’s temperament (White *et al.*, 2020).

Indicators of a distressed bird include loud vocalizations, sometimes repeated until the disturbance ends, and posturing on approach (USFWS, no date). Agnostic vocalizations include hissing, chittering, cacking or wailing (White *et al.*, 2020). Threatening postures of Peregrine Falcon include erect feathers, bill open or turned toward recipient of behaviour (White *et al.*, 2020). Body of the bird(s) may be oriented vertically or horizontally with wings and tail partially spread (White *et al.*, 2020). Because normal relaxed posture is upright, a threatening posture with vertical body orientation is generally considered less intense defensive posturing during agonistic encounters, whereas horizontal body orientation is offensive (White *et al.*, 2020). Aggressive/defensive behaviour may progress

from static display to strutting, charging, lunging and grappling, with the bird using its wings, talon and bill to attack, if threat postures fail to deter a perceived intruder (White *et al.*, 2020; USFWS, no date).

2.3 Peregrine Falcon at the Burlington Canal Lift Bridge

Timing of the annual cycle for the Peregrine Falcon at the BCLB is summarized in **Table 1**. In spring 2007, a nest box was installed at the window of the north tower of the bridge, facing south, in close proximity to the Peregrine Falcon nest site from 2003 to 2006, which was located on a south-facing ledge of the same tower but at a lower elevation (Chan, 2019). The location of the nest box is shown in **Figure 1**. Peregrine Falcons have successfully hatched chicks using the nest box from 2008 to 2013 (Chan, 2019). According to the Canadian Peregrine Foundation, the nest has been active every year since (2020) and it should be assumed to be active each year hereafter. The nest box was installed in order to decommission the previous nest site through the installation of physical barriers (Chan, 2019). A similar approach allowed Peregrine Falcons to nest successfully on the Milton-Madison (US-421) Bridge over the Ohio River during demolition and reconstruction (Slankard *et al.*, 2020). Mesh materials secured with steel wire were installed at potential nesting sites on the Milton-Madison Bridge (e.g., where beams converged creating a hollow or forming a shelf) to encourage Peregrine Falcons to use the nest box positioned away from construction activities on the structure (Slankard *et al.*, 2020).

Turnover of mating pairs has been observed at the BLCB following territorial disputes resulting in a change of occupancy of the bridge (Chan, 2019). The behavioural responses of individual nesting pairs to disturbances in the nest territory varies (OPFRT, 2010). Although urban Peregrine Falcons are generally more habituated to, and less disturbed by human activities, they may abandon nests if construction or maintenance occurs nearby (OPFRT, 2010). Peregrine Falcons at BLCB were reported to exhibit defensive territorial behaviour towards bridge personnel if they were on any part of the structure during the breeding season (Chan, 2019). Peregrine Falcons at other urban nest sites have been known to escalate their defensive behaviours the longer they occupy a particular nest site (Chan, 2019). During the non-breeding season between September to February, the Peregrine Falcon pair continues to occupy the bridge, regarding it as their territory and hunting grounds (Chan, 2019). Although the birds typically do not display aggressive defensive behaviour towards bridge staff (Chan, 2019), individual's response may differ with temperament (refer to **Section 2.2**).

Table 1: Timeline of Peregrine Falcon Annual Cycle at the Burlington Canal Lift Bridge

Annual Cycle	Timing
Nesting season (includes courtship and nest site selection/nest-building)	Late February/Early March to mid-August
Egg laying (scrape or nest box on north tower)	End of March to early April
Incubation (approximately 33-35 days)	Early April to mid May
Nestling period (approximately 6 weeks)	End of May to mid June
Fledgling period (initially dependent on parental feeding, approximately 9-12 weeks)	Late July to mid August
Immature stage (dispersal from nest area)	Mid-August to early September
No breeding activity (pair remains at the bridge/territory, hunting yet not disturbing bridge staff)	September to February

3. Best Management Practices

Bridge rehabilitation projects are required periodically to ensure its safe operation. In addition, routine activities (i.e., maintenance and inspection) are required to continue over the lifetime of the bridge on an annual and/or monthly basis. As well, unexpected emergencies such as mechanical and/or electrical breakdowns may occur. As a result, there are health and safety concerns for workers as well as the potential for disturbance to the nesting Peregrine Falcons.

The following sections describe best management practices adapted from the 2007 Peregrine Falcon Management Plan (Chan, 2019) as well as additional measures identified by AECOM through a review of literature and in consultation with Ontario and Canada experts in Peregrine Falcon behaviour and biology. These are also summarized in Error! Reference source not found..

To minimize human-Peregrine Falcon conflicts, work should be scheduled September to February, outside of the Peregrine Falcon nesting season (early March to mid-August), where possible, and staff should be trained/made aware of the potential risk for attack. However, the following types of construction or maintenance activities² are expected to have no effect on nesting Peregrine Falcon and may be conducted on the structure at any time:

- Drift/debris removal from the canal;
- Inspections at or near ground level;
- Minor culvert maintenance;
- Minor structural or road surface repairs (on the roadway or shoulder or bridge deck, without snooper cranes);
- Lawn management (no tree cutting);
- Sign replacement, repairs, and cleaning;
- Snow and ice removal and sanding;
- Special events, pedestrian (e.g., bridge pedal, foot races, walkathons, etc.); and
- Sweeping of pavement at ground level (not including roof-tops).

Note that if monitoring by an avian biologist determines that neither the nest box nor other locations on the bridge are being used by breeding Peregrine Falcons, then construction or maintenance activities will be considered to have no effect and may proceed with no restrictions during that year. Similarly, if monitoring by an avian biologist determines that an active nest site fails and no new nest is established, then construction or maintenance activities will be considered to have no effect and may proceed with no restrictions for the remainder of the year.

3.1 Temporal Buffers

Activities, especially those that may disturb the birds (e.g., construction), should be scheduled September to February, outside of the Peregrine Falcon nesting season (early March to mid-August), where possible.

² Only pertains to maintenance activities that occur on the level of the roadway or bridge traffic deck (not over the sides, underneath, or above the level of the rails of the deck). It also includes only minor repairs to the roadway, road shoulder, sidewalk, bridge traffic deck, or rails that do not involve equipment that is louder than ambient noise levels (i.e., impact pile drivers, jackhammers, pneumatic wrenches, etc.) or do not involve large construction vehicles (i.e., tractors, backhoes, graders, scrapers, pavers, concrete mixers, etc.). Any work that includes use of a helicopter, lift crane, or snooper crane is not included.

If an activity has the potential to adversely impact nesting Peregrine Falcons and cannot be avoided during the nesting season, PWGSC will contact MNRF prior to conducting work (or as soon as possible for emergency works) to determine additional management/mitigation (e.g., monitoring) recommendations for implementation.

Peregrine Falcons are present year-round at the BCLB. Peregrine Falcons that remain at the nest site may exhibit territorial behaviour including threat displays and agnostic vocalizations (White *et al.*, 2020). Often intruders are stooped at, sometime jointly by the pair along with 'cack' calls (White *et al.*, 2020). If territorial behaviour is exhibited September to February, outside of the Peregrine Falcon nesting season (early March to mid-August), then implementation of the mitigation measures described in **Section 3.4** is recommended.

3.2 Monitoring

Given the history of Peregrine Falcon nesting at the BCLB (refer to **Section 2.3**), it should be assumed that the species will continue to use the nest box each year. However, at least one two-hour observational survey by an avian biologist³ is recommended if bridge staff think Peregrine Falcons are no longer present.

Monitoring by an avian biologist, as determined in consultation with the MNRF, is also recommended during an activity that has the potential to disturb the birds and cannot avoid the nesting season (early March to mid-August). The purpose of the monitoring program is for the avian biologist to track effectiveness of the implemented management/mitigation measures and make recommendations for adaptive management (ODOT, 2007).

3.3 Spatial Buffers

Buffers may be applied to nest site to provide spatial and temporal boundaries for conducting specific activities (ODOT, 2007). Buffers may be adjusted between and among years given that individual Peregrine Falcons differ in their susceptibility to disturbance and that the pair may develop tolerance within a season (Slankard *et al.*, 2020). For example, buffer distance employed during the Milton-Madison Bridge reconstruction, which ranged from 46 m to 91 m away from the nest box, depended on the activity (i.e., occasionally reduced buffer for less frequent activities) and resilience of the Peregrine Falcon pair to human disturbance based on behavioural observations (Slankard *et al.*, 2020). Buffer implementation and adjustments will be developed on a case-by-case basis by an avian biologist, based on monitoring, and in consultation with the MNRF. PWGSC will inform operations, maintenance and construction personnel of the location of the nest and buffer zones prior to commencement of any work during the Peregrine Falcon nesting season (early March to mid-August).

3.4 Mitigation Measures to Deter Attacks

The following mitigation measures are intended to minimize the risk of attacks on workers:

- Minimize the duration of time spent on the structure;
- Complete tasks in the fewest visits by maximizing the number of separate activities within the same time period;
- All on-site personnel are to be made aware of the presence of Peregrine Falcon, nest box location and potential risk for attack (e.g., through the distribution of the Peregrine Falcon Safety Plan provided in **Appendix A**);
- Workers on the tower roof and outdoor platforms should wear heavy jacket, hardhat and neck protection;
- Attach false eyes on the back of hardhats as a deterrent;

³ Avian biologist is defined as an individual that has a degree in wildlife biology or equivalent work experience and knowledge of Peregrine Falcon breeding ecology, behaviours and monitoring protocols.

- Raptors typically attack the tallest object rather than the person (USFWS, no date). As such, workers may carry an open umbrella or stick with flags attached above head for activities that occur on the level of the roadway or bridge traffic deck (i.e., not over the sides, underneath, or above the level of the rails of the deck). These objects are not to be used as weapons to attack the birds;
- Install signage to alert workers and pedestrians about the potential risk for Peregrine Falcon attacks at the BCLB;
- A spotter (avian biologist or an individual trained by an avian biologist) should be on the ground to watch bird and be in communication with worker on the tower roof or outdoor platform to notify if aggressive bird is approaching;
- Where feasible, consider installing temporary scaffolding where work is required and attaching cover around scaffold so birds cannot see workers;
- Consider portable canopies over frequently used walkways to provide further protection; and
- Consider installing temporary flags or flapping cloth on poles near works or walkways to create obstacle for birds and prevent them from flying too close (e.g., bird repellent reflective scare tape; see **Figure 2**).



Figure 2: Bird Repellent Reflective Scare Tape

3.5 Capture and Relocation

Capture and relocation will be considered only as a last resort and done only after careful consideration of the life cycle stage and situation.

Capture and relocation may be considered if the falcons do not successfully nest in the nest box but nest in another location on the structure that interferes with its operation or proposed construction or maintenance activities that cannot avoid the Peregrine Falcon nesting season (early March to mid-August). Note that this may be avoided through the installation and maintenance of nesting prevention/exclusion measures at all potential nesting sites prior to the Peregrine Falcon nesting season. Capture and relocation may also be required and conducted when a bridge activity endangers the safety of the birds or their nest and eggs and cannot be avoided.

Once the eggs have been laid, no relocation can be conducted as this may result in abandonment by adults (Chan, 2019). Chicks cannot be moved until at least 12 days after hatching and can only occur under the discretion of an MNRF biologist that has the training and experience in relocating falcons. If relocation is to occur, chicks will be moved to the nest box, if possible, or transported to an authorized wildlife rehabilitator, as coordinated with MNRF. Since Peregrine Falcon nests are located at a significant height above the ground, the biologist must have all appropriate health and safety training as required by PWGSC and the Ontario Occupational Health and Safety Act.

In summary, capture and relocation will only be implemented if the following conditions are met:

- Bridge activities that could result in compromising the safety of the birds or their nests and eggs cannot be avoided;
- Monitoring confirms the exact nest location and nesting chronology within one-day accuracy;
- PWGSC has consulted with the MNRF and obtained required permits or authorizations;
- Capture and relocation of live chicks is anticipated by the MNRF;
- Any biologist who handles a Peregrine Falcon has current appropriate MNRF approvals/accreditation and has prior experience at the BCLB or other Peregrine Falcon nest sites; and
- Personnel must have appropriate health and safety training as determined by PWGSC.

Table 2: Peregrine Falcon Best Management Practices Summary

Row Number	Activity/Situation	Mitigation	Contingency
1	<ul style="list-style-type: none"> ▪ Work outside of the nesting season that does not alter a known nest ledge (other than enhancements). 	<ul style="list-style-type: none"> ▪ All on-site personnel are to be made aware of the presence of Peregrine Falcon, nest box location and potential risk for attack (e.g., through the distribution of the Peregrine Falcon Safety Plan provided in Appendix A). 	<ul style="list-style-type: none"> ▪ If Peregrine Falcon pair exhibits territorial behaviour September to February, outside of the nesting season (early March to mid-August), the following mitigation measures may apply: <ul style="list-style-type: none"> ○ Minimize the duration of time spent on the structure; ○ Complete tasks in the fewest visits by maximizing the number of separate activities within the same time period; ○ Workers on tower roof and outdoor platform should wear heavy jacket, hardhat and neck protection; ○ Attach false eyes on the back of hardhats as a deterrent; ○ Raptors typically attack the tallest object rather than the person (USFWS, no date). As such, workers shall carry an open umbrella or stick with flags attached above head for activities that occur on the level of the roadway or bridge traffic deck (i.e., not over the sides, underneath, or above the level of the rails of the deck). These objects are not to be used as weapons to attack the birds. ○ Install signage to alert workers and pedestrians about the

Row Number	Activity/Situation	Mitigation	Contingency
			<p>potential risk for Peregrine Falcon attacks at the BCLB;</p> <ul style="list-style-type: none"> ○ A spotter (avian biologist or an individual trained by an avian biologist) should be on the ground to watch bird and be in communication with worker on tower to notify if aggressive bird is approaching; ○ Where feasible, consider installing temporary scaffolding where work is required and attaching cover around scaffold so birds cannot see workers; ○ Consider portable canopies over frequently used walkways to provide further protection; and ○ Consider installing temporary flags or flapping cloth on poles near works or walkways to create obstacle for birds and prevent them from flying too close. <p>▪ If Peregrine Falcon pair continue to pose a health and safety risk to workers due to aggressive defensive behaviour September to February, outside of the nesting season (early March to mid-August) despite implementation of the above mitigation measures, then PWGSC will consult with the MNR to determine next steps (e.g., capture and relocation of adults).</p>

Row Number	Activity/Situation	Mitigation	Contingency
2	<ul style="list-style-type: none"> ▪ Construction or maintenance activities considered to have no effect on nesting Peregrine Falcons: <ul style="list-style-type: none"> ○ Drift/debris removal from the canal; ○ Inspections at or near ground level; ○ Minor culvert maintenance; ○ Minor structural or road surface repairs (on the roadway or shoulder or bridge deck, without snooper cranes); ○ Lawn management (no tree cutting); ○ Sign replacement, repairs, and cleaning; ○ Snow and ice removal and sanding; ○ Special events, pedestrian (e.g., bridge pedal, foot races, walkathons, etc.); and ○ Sweeping of pavement at ground level (not including roof-tops). 	<ul style="list-style-type: none"> ▪ All on-site personnel are to be made aware of the presence of Peregrine Falcon, nest box location and potential risk for attack (e.g., through the distribution of the Peregrine Falcon Safety Plan provided in Appendix A). 	<ul style="list-style-type: none"> ▪ See mitigation and contingency column of row 3 or 4.
3	<ul style="list-style-type: none"> ▪ Construction or maintenance activities that may affect nesting Peregrine Falcons (i.e., not listed above). 	<ul style="list-style-type: none"> ▪ Scheduled activity September to February, outside of the Peregrine Falcon nesting season (early March to mid-August). ▪ All on-site personnel are to be made aware of the presence of Peregrine Falcon, nest box location and potential risk for attack (e.g., through the distribution of the Peregrine Falcon Safety Plan provided in Appendix A). 	<ul style="list-style-type: none"> ▪ If activity cannot avoid the Peregrine Falcon nesting season (early March to mid-August), see mitigation and contingency columns of row 4. ▪ If Peregrine Falcon pair exhibits territorial behaviour September to February, outside of the nesting season (early March to mid-August), see contingency column of row 1.

Row Number	Activity/Situation	Mitigation	Contingency
4	<ul style="list-style-type: none"> ▪ Construction or maintenance activity that may affect nesting Peregrine Falcons but cannot avoid the nesting season (early March to mid-August) (e.g., emergency repairs). 	<ul style="list-style-type: none"> ▪ All on-site personnel are to be made aware of the presence of Peregrine Falcon, nest box location and potential risk for attack (e.g., through the distribution of the Peregrine Falcon Safety Plan provided in Appendix A). ▪ Implement mitigation measures listed in contingency column of row 1. ▪ Develop and implement monitoring program. ▪ Implement spatial buffer, the distance of which may vary as determined by an avian biologist, based on monitoring, in consultation with the MNRF. ▪ PWGSC will inform operations, maintenance and construction personnel of the location of the nest and buffer zones. 	<ul style="list-style-type: none"> ▪ If neither the nest box nor other location on the bridge is being used by breeding Peregrine Falcons, then construction or maintenance activities may proceed with no restrictions. ▪ If an active nest site fails and no new nest is established, then construction or maintenance activities may proceed with no restrictions.
5	<ul style="list-style-type: none"> ▪ Peregrine Falcons nest in a location on the structure that interferes with bridge activity that cannot avoid the nesting season (early March to mid-August); and/or ▪ Bridge activity that cannot avoid the nesting season (early March to mid-August) that endangers the safety of the birds or their nest and eggs. 	<ul style="list-style-type: none"> ▪ Install and maintain nesting prevention/exclusion measures at all potential nesting sites prior to the Peregrine Falcon nesting season. ▪ Capture chicks at 12 days after hatching and relocate to the existing nest box, if possible, or transport chicks to an authorized wildlife rehabilitator, as coordinated with MNRF. ▪ PWGSC will consult with the MNRF and obtain required permits or authorizations. 	<ul style="list-style-type: none"> ▪ None.

4. References

- The Canadian Peregrine Foundation, 2020:
Burling Lift Bridge Peregrine Activity Reports. Available:
<http://www.peregrine-foundation.ca/w/c/sightings/burlington-lift-bridge/>. Accessed September 2020.
- Chan, L., 2019:
Peregrine Falcon Management Plan Burling Lift Bridge, Hamilton, Ontario. Public Works and Government Services Canada. Original version: August 2007. Updated November 2019.
- Committee on the Status of Endangered Wildlife in Canada (COSEWIC), 2007:
COSEWIC assessment and update status report on the Peregrine Falcon *Falco peregrinus (pealei* subspecies - *Falco peregrinus* and *pealei anatum/tundrius* - *Falco peregrinus anatum/tundrius*) in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 45 pp.
- Cornell University, 2019:
All About Bird. Peregrine Falcon. Available: https://www.allaboutbirds.org/guide/Peregrine_Falcon/. Accessed July 2020.
- Ontario Ministry of Natural Resources and Forestry (MNRF), 2013:
Peregrine Falcon Evaluation. Available: <https://www.ontario.ca/page/peregrine-falcon-evaluation>. Accessed July 2020.
- Ontario Peregrine Falcon Recovery Team (OPFRT), 2010:
Recovery strategy for the Peregrine Falcon (*Falco peregrinus*) in Ontario. Ontario Recovery Strategy Series. Prepared for the Ontario Ministry of Natural Resources, Peterborough, Ontario. vi + 36 pp.
- Oregon Department of Transportation Environmental Services (ODOT), 2007.
Peregrine Falcon Management Plan 2002, 2007. Available:
<https://www.nrc.gov/docs/ML1428/ML14286A067.pdf>. Accessed July 2020.
- Slankard, K.G, L.F. Taylor, D.M. Stoelb and C. Gannon, 2020:
Peregrine falcons nest successfully during reconstruction of bridge over Ohio River. Human – Wildlife Interactions 14(1): 96-103.
- White, C.M., N.J. Clum, T.J. Cade and W.G. Hunt, 2020:
Peregrine Falcon (*Falco peregrinus*), version 1.0. In Birds of the World (S. M. Billerman, Editor). Cornell Lab of Ornithology, Ithaca, NY, USA. <https://doi.org/10.2173/bow.perfal.01>
- U.S. Fish and Wildlife Service (USFWS), no date:
Aggressive Birds. Available: <https://www.fws.gov/cno/conservation/MigratoryBirds/pdf-files/Aggressive-birds-4-27-18.pdf>. Accessed July 2020.
- Personal communication. Mark Heaton, Management Biologist, Ontario Ministry of Natural Resources and Forestry.
- Personal communication. Marcel Gahbauer, Executive Director, Migration Research Foundation.

Appendix **A**

Peregrine Falcon Safety Plan

Public Works and Government Services Canada

Burlington Canal Life Bridge

Peregrine Falcon Safety Plan

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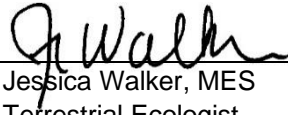
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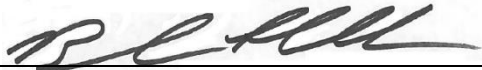
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Appendices

Appendix A. Peregrine Falcon Fact Sheet

1. Introduction

AECOM Canada Ltd. (AECOM) has been retained by Public Works and Government Services Canada (PWGSC) to provide this site-specific Peregrine Falcon Safety Plan in support of ongoing inspection and maintenance work at the Burlington Canal Lift Bridge (BCLB). The purpose of this Peregrine Falcon Safety Plan is to identify, evaluate, and control safety and health hazards, and to outline emergency response actions related to Peregrine Falcon at the BCLB. This, in conjunction with the overall Health and Safety Plan prepared for a particular project or maintenance activity, must be kept on site during work activities and made available to all workers including contractors and subcontractors and other site occupants for informational purposes. Contractors and subcontractors are expected to independently characterize, assess, and control site hazards created by their specific scope of work.

2. Site Description

The BCLB, owned and operated by PWGSC, is located at 1157 Beach Boulevard, at the intersection of Eastport Drive / Provincial Highway 20, in Hamilton, Ontario (**Figure 1**). The present bridge has been in operation since 1962 and provides for 4-lane vehicular traffic flow along Eastport Drive / Beach Boulevard. The BCLB consists of two towers and a moveable bridge to allow marine traffic between Hamilton Harbour and Lake Ontario during the navigation season from mid March to late December.

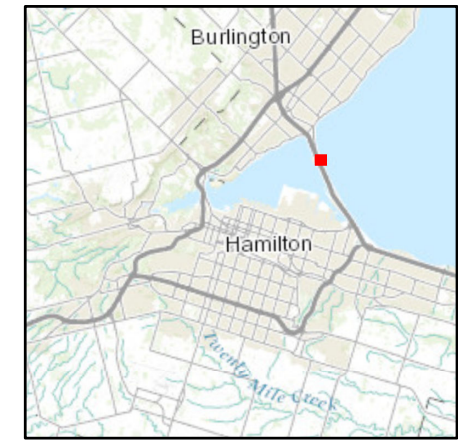
2.1 Site Background/History

Peregrine Falcon (*Falco peregrinus anatum*) have been observed year-round at the BCLB (Chan, 2019). The species was confirmed to be regularly nesting on the north tower of the bridge since 2003 (**Figure 1**). During the nesting season (early March to mid-August), the birds exhibit aggressive defensive behaviour towards bridge staff (Chan, 2019). During the non-breeding season between September to February, the Peregrine Falcon pair continues to occupy the bridge, regarding it as their territory and hunting grounds (Chan, 2019).

A Peregrine Falcon Management Plan was prepared in 2007 to address health and safety of PWGSC personnel in consideration of the species' previous Threatened status under Schedule 1 of Canada's *Species at Risk Act, 2002* (SARA). AECOM updated the Peregrine Falcon Management Plan in 2020 under a separate cover to improve the overall safe operations at the site for current or future undertakings by PWGSC staff or associated contractors in consideration of the species' current status under applicable legislation. Peregrine Falcon was reassessed in June 2012 and down-listed to Special Concern under Schedule 1 of the SARA. The species is also designated as Special Concern under Ontario's *Endangered Species Act, 2007* (ESA). Although species listed as Special Concern do not receive individual or habitat protection under the SARA or ESA, Peregrine Falcon, including their nests and eggs, continues to receive protection under Ontario's *Fish and Wildlife Conservation Act, 1997* (FWCA), administered by the Ontario Ministry of Natural Resources and Forestry (MNRF).

2.2 Scope of Work

Proposed work at the site may include maintenance work on the towers, lift span and deck, including mechanical or electrical components and closeup inspection of the main and auxiliary counterweight ropes and structural components by climbing.



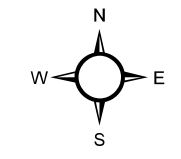
Key Map

Legend

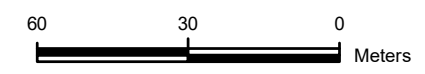
- Roads
- ★ Peregrine Falcon Nest Box Location



Peregrine Falcon Nest Box



1:1,500
NAD 1983 UTM Zone 17N



Basemap:
 Additional Sources:
 Ortho-Imagery:
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3. Peregrine Falcon Safety Plan

The following section identifies measures to reduce the likelihood of worker attacks identified in the updated Peregrine Falcon Management Plan. PWGSC intends to conduct activities described in the scope of work (**Section 2.2**) September to February, outside of the Peregrine Falcon nesting season (early March to mid-August) in accordance with best management practices/mitigation measures identified in the *Peregrine Falcon Management Plan* (AECOM, 2020). Construction or maintenance activities outside of the nesting season that does not alter a known nest ledge (other than enhancements) are assumed to have no effect on the nesting Peregrine Falcons and the birds do not typically display aggressive defensive behaviour during the non-breeding season (Chan, 2019).

However, pairs vary greatly in responsiveness to human activities depending partly on individual characteristics, stage of annual life cycle, and environmental circumstances (e.g., pairs in remote locations are more reactive than those in urban areas that typically become habituated to nearby human activities) (White *et al.*, 2020). While avoiding the nesting period when the birds are most sensitive to disturbances, presence of year-round resident Peregrine Falcons has been previously recorded at the BCLB. Peregrine Falcons that remain at the nest site may exhibit territorial behaviour (White *et al.*, 2020). As such, the following mitigation measures are recommended:

- Minimize the duration of time spent on the structure;
- Complete tasks in the fewest visits by maximizing the number of separate activities within the same time period;
- All on-site personnel are to be made aware of the presence of Peregrine Falcon, nest box location and potential risk for attack (**Appendix A**);
- Workers on the tower roof and outdoor platform should wear heavy jacket, hardhat and neck protection;
- Attach false eyes on the back of hardhats as a deterrent;
- Raptors typically attack the tallest object rather than the person (USFWS, no date). As such, workers shall carry an open umbrella or stick with flags attached above head for activities that occur on the level of the roadway or bridge traffic deck (i.e., not over the sides, underneath, or above the level of the rails of the deck). These objects are not to be used as weapons to attack the birds;
- Install signage to alert workers and pedestrians about the potential risk for Peregrine Falcon attacks at the BCLB;
- A spotter (avian biologist or an individual trained by an avian biologist) should be on the ground to watch bird and be in communication with worker on the tower roof or outdoor platform to notify if aggressive bird is approaching;
- Where feasible, consider installing temporary scaffolding where work is required and attaching cover around scaffold so birds cannot see workers;
- Consider portable canopies over frequently used walkways to provide further protection;
- Consider installing temporary flags or flapping cloth on poles near works or walkways to create obstacle for birds and prevent them from flying too close (e.g., bird repellent reflective scare bird tape; see **Figure 2**).
- If Peregrine Falcon pair continue to pose a health and safety risk to workers due to aggressive defensive behaviour September to February, outside of the nesting season (early March to mid-August) despite implementation of the above mitigation measures, then PWGSC will consult with the MNRF to determine next steps.



Figure 2: Bird Repellent Reflective Scare Tape

If construction or maintenance activity cannot avoid the Peregrine Falcon nesting season (early March to mid-August), the above best management practices/mitigation measures may apply as well as monitoring by an avian biologist, spatial buffers, and capture and relocation, as described in detail in the updated Peregrine Falcon Management Plan.

4. Training and Documentation

This site-specific Peregrine Falcon Safety Plan, in conjunction with the overall Health and Safety Plan specific to project activities, must be reviewed and kept on site during work activities and made available to all workers including contractors and subcontractors and other site occupants for informational purposes.

Spotter for proposed works where required shall be an avian biologist, i.e., have a degree in wildlife biology or equivalent work experience and knowledge of Peregrine Falcon breeding ecology, behaviors and monitoring protocols, or trained by an avian biologist.

5. Personal Protective Equipment

Personal Protective Equipment (PPE) is considered the last line of defense in hazard control. PPE is meant to protect workers when all other methods (elimination, substitution, engineering, and administrative) have been exhausted. All employees must be trained in the proper use and maintenance of PPE.

A PPE Assessment can be performed to help determine PPE requirements. PPE upgrades for individual tasks or steps of a task are to be identified in the appropriate Task Hazard Analyses

The following PPE to address the potential for Peregrine Falcon attacks may include:

- Heavy jacket;
- Neck protection;
- False eyes affixed to back of hard hat; and
- Umbrella or stick with flags attached.

6. Emergency Response

First-aid may be required in the event that a worker is attacked by Peregrine Falcon. Depending on severity of the injury, medical attention in accordance with the contract specific Health and Safety Plan may be required.

Any injury resulting from interaction with Peregrine Falcon involving or affecting a worker, even if no treatment is required, is to be reported to PWGSC.

7. References

AECOM, 2020:

Burling Canal Life Bridge. Peregrine Falcon Management Plan. Prepared for Public Works and Government Services Canada. September 2020.

Chan, L., 2019:

Peregrine Falcon Management Plan Burling Lift Bridge, Hamilton, Ontario. Public Works and Government Services Canada. Original version: August 2007. Updated November 2019.

White, C.M., N.J. Clum, T.J. Cade and W.G. Hunt, 2020:

Peregrine Falcon (*Falco peregrinus*), version 1.0. In Birds of the World (S. M. Billerman, Editor). Cornell Lab of Ornithology, Ithaca, NY, USA. <https://doi.org/10.2173/bow.perfal.01>

U.S. Fish and Wildlife Service (USFWS), no date:

Aggressive Birds. Available: <https://www.fws.gov/cno/conservation/MigratoryBirds/pdf-files/Aggressive-birds-4-27-18.pdf>. Accessed July 2020.

Personal communication. Mark Heaton, Management Biologist, Ontario Ministry of Natural Resources and Forestry.

Personal communication. Marcel Gahbauer, Executive Director, Migration Research Foundation.

Appendix **A**

Peregrine Falcon Fact Sheet

Peregrine Falcon *(Falco peregrinus anatum)*

Identification

- ▶ Crow-sized raptor
- ▶ Adults are blue gray above, white breast and barred belly
- ▶ Juveniles are brown and heavily streaked
- ▶ Long pointed wings and long narrow tail

Habitat

- ▶ Mostly nest in urban areas in southern Ontario → ledges on human-made structures 11 to 23 m above the ground (e.g., building, bridges mostly)
- ▶ At the Burlington Canal Lift Bridge (BCLB), nested on a south-facing ledge on the north tower from 2003-2007
- ▶ In 2007, nest box was installed adjacent to the south-facing window of the north tower of the bridge and was used from 2008 onwards
- ▶ Species typically migratory; however, some, including pair at the BCLB, remain onsite year-round
- ▶ **Timing:** early March to mid August (includes courtship and fledgling period)

Threats

- ▶ Environmental contaminants (e.g., pesticides used to control bird prey such as pigeons)
- ▶ Collisions with buildings, vehicles, etc.
- ▶ Human disturbance at or near the nest site
- ▶ Capture for falconry

Behaviour

- ▶ More likely to respond aggressively during the nesting season but may exhibit territorial behavior at anytime
- ▶ Responsiveness to disturbance varies with individuals
- ▶ Indicators of distressed birds:
 - Erect feathers
 - Wings and tail partially spread
 - Open bill, loud vocalizations (hissing, chittering, cacking or wailing) that are sometimes repeated

Peregrine Falcon at BCLB nest box



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Protection

- ▶ Peregrine Falcon is listed as Special Concern¹ under Schedule 1 of the Species at Risk Act, 2002 (SARA) and the Endangered Species Act, 2007 (ESA)
- ▶ Specially protected raptor under the Fish and Wildlife Conservation Act, 1997, which prohibits:
 - Hunting or trapping unless authorized by the Ontario Ministry of Natural Resources and Forestry (MNR);
 - Destroying, taking or possessing the nests or eggs unless authorized by the MNR

Status:

Special Concern

¹ Special Concern species do not receive individual or habitat protection under the SARA or ESA

