Imminent Threat Assessment for the Western Chorus Frog

Introduction

This document assesses the threats to the Western Chorus Frog, Great Lakes/St. Lawrence – Canadian Shield population (Western Chorus Frog (GLSLCS)), using the best available information, with the aim of informing an opinion as to whether or not this wildlife species faces imminent threats to its survival or recovery in Canada, as per section 80 of the Species at Risk Act (SARA).

Section 80 of SARA states that the competent minister must make a recommendation to the Governor in Council (GiC) to make an emergency order to provide for the protection of a listed wildlife species, if the competent minister is of the opinion that the species faces imminent threats to its survival or recovery. The federal Minister of the Environment is the competent minister for the Western Chorus Frog (GLSLCS).

This threat assessment considers the population and distribution objectives set out in the final federal recovery strategy for the species. It takes into account information on the biology and ecology of the species, threats to its survival and recovery and its population and habitat status and trends. An analysis of existing measures that protect the species against threats is also provided.

The information considered in the assessment includes information provided by the provinces of Quebec and Ontario, various municipalities, conservation authorities, non-governmental organizations, species experts, federal organizations and Quintcap Inc. (the developer of a residential project in La Prairie, Quebec), in addition to the information in the final federal recovery strategy and in the scientific literature. Supporting documents with more detailed information on the Western Chorus Frog (GLSLCS) and existing legal protection mechanisms are appended to this document.

Socio-economic impacts were not considered in the assessment, as they are not relevant to determining whether or not a wildlife species is facing imminent threats. Socio-economic considerations would inform a Governor in Council (GiC) decision, further to a recommendation by the competent minister.

1.0 An Overview of the Western Chorus Frog (GLSLCS)

1.1 Species Biology

The Western Chorus Frog (GLSLCS) is a small amphibian, about 2.5 cm in length, which usually breeds in temporary wetlands devoid of predators, such as fish and larger frogs, located near open habitats or discontinuous forests. The life expectancy of adults is usually one year (a single reproductive event), although some have been known to live for up to three years. Western Chorus Frog (GLSLCS) populations can be connected by processes of migration, genetic exchange and colonization, forming larger units called metapopulations. A metapopulation structure is highly dependent on connections among populations and, where it occurs, is a key element to maintaining genetic diversity and to providing resilience from natural or anthropogenic disturbances (i.e., they are important for maintaining the ability of Western Chorus Frog (GLSLCS) to recover from natural or anthropogenic disturbances). Western Chorus Frog (GLSLCS) metapopulation structures are well-documented in Quebec, but there is no available information on such structures in Ontario.
The Western Chorus Frog (GLSLCS) occupies a variety of lowland habitats in clearings, damp meadows, fallow lands and shrublands, where slight depressions in topography support the formation of wetlands such as marshes, swamps, and ponds that generally dry out in summer. The habitats occupied by the species must provide for the specific needs of the various life cycle stages of breeding, hibernation, foraging and movement. Dispersal outside of individual home ranges is also an important element to maintain local populations and metapopulations.

During the breeding period, individuals primarily occupy temporary wetlands. As the breeding wetlands are temporary in nature, there is increased susceptibility to premature drying due to climate variations such as high temperatures, low precipitation or other causes such as altered drainage. This partly explains why large fluctuations in abundance may occur from year-to-year in some populations. The persistence of local populations therefore depends on the availability of a sufficient number of wetlands that hold water for a sufficiently long period to allow tadpoles to change (i.e. metamorphose) into their adult form, even in drought years.

Foraging as well as other activities conducted in terrestrial habitats have been shown to generally occur within a 250 to 300 m radius of breeding wetlands. The Western Chorus Frog (GLSLCS) has limited movement capabilities both in aquatic and terrestrial habitats, with a daily average of 3.5 m and a daily maximum of 42 m. In combination with their small size, these characteristics make individuals susceptible to dehydration when they cross drier environments and make local populations vulnerable to the loss of lowland habitats.

Individuals hibernate in the terrestrial portion of their home range, in soft soil substrates, under rocks, dead trees or dead leaves or in existing burrows. Almost all individuals hibernate less than 100 m from breeding wetlands, although some have been seen at more than 200 m away from these wetlands. One possible reason for this is that proximity to such sites affords a reproductive advantage during the spring thaw.

**Western Chorus Frog species classification**

The SARA definition of “wildlife species” recognizes that conservation of biological diversity requires protection below the species level (e.g., protection of subspecies, varieties or geographically or genetically distinct populations).

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) assessments and GiC listing decisions are at the level of “designatable unit” (DU), which COSEWIC guidelines define as discrete and evolutionarily significant units of the species, where “significant” means that the unit is important to the evolutionary legacy of the species as a whole and, if lost, would likely not be naturally replaced.

COSEWIC has identified the Great Lakes/St. Lawrence – Canadian Shield (GLSLCS) population of Chorus Frog as a DU and determined that the DU belongs to the species of Chorus Frog identified as Western Chorus Frog (see Figure 1).
Following the COSEWIC status assessment of 2008, the DU was listed as “Threatened” under Schedule 1 of SARA in 2010.¹

This threat assessment takes into account newly available information (i.e., information from the Municipality of La Prairie and Quintcap Inc., clarification from three representatives of COSEWIC, as well as recent scientific publications) about whether the GLSLCS population of Western Chorus Frog would more properly be assigned to a different taxonomic entity: the Boreal Chorus Frog (*Pseudacris maculata*).

In considering the available information, the Department placed greatest weight on the clarification provided by COSEWIC rather than any one particular study or author. This Committee is the authoritative body in Canada established as an independent arm’s length technical committee responsible for determining the DU which is to be assessed, and for conducting a status assessment of that DU. COSEWIC brings together species specialists from across the different classes of animals and plants, and, on the basis of that collective expertise and knowledge, determines the taxonomic classification of each biological ‘unit’ it assesses. Its decisions in this regard are reflected in how a species is listed under Schedule 1 of SARA.

The Department observed that the clarification provided by the three representatives of COSEWIC took into account all of the new technical information, including the technical information that the developer had cited, since its assessment of the Western Chorus Frog (GLSLCS) that was completed in 2008. Rather than finding the new technical information to be conclusive, the COSEWIC clarification confirms there is continued uncertainty. In light of this continued uncertainty, EC relies on the pre-existing assessment of COSEWIC given their expertise in this matter and because this also ensures continued protection for the species under the Act. The term “Western Chorus Frog (GLSLCS)” used in this document refers to the biological entity of chorus frogs classified as the GLSLCS population of Western Chorus Frog.

1.2 The distribution of the wildlife species.

The Western Chorus Frog (GLSLCS) is found in the lowlands of south-central and eastern Ontario, as well as in south-western Quebec.

In Quebec, the Western Chorus Frog (GLSLCS) was historically present in the southern part of the province, from the Ottawa Valley to the foothills of the Appalachians and west of the Richelieu River. Currently, the species is estimated to occupy 10% of its former range. The current range of the species in Quebec is found in two distinct regions: Outaouais and Montérégie (Figure 2).

¹ The Province of Quebec has listed the GLSLCS population of Chorus Frog as Vulnerable under the provincial Act Respecting Threatened or Vulnerable Species since 2001, and its status is currently under review. It is listed as a population of the Western Chorus Frog species.

The GLSLCS population of Chorus Frog is treated together with the Carolinian population of Chorus Frog as a single population of Western Chorus Frog by the Province of Ontario, due to a different interpretation of the genetic evidence. It is classified as not at risk by the Committee on the Status of Species at Risk in Ontario (COSSARO) and, therefore, has not been considered for listing under the Ontario Endangered Species Act, 2007.
In Ontario, the Western Chorus Frog (GLSLCS) is more widespread, with a range that extends from the Carolinian- Great Lakes/ St. Lawrence faunal province boundary northward into the southern part of the Canadian Shield faunal province. It extends eastward from the Sault Ste. Marie area to the Ottawa Valley and along the St. Lawrence River into the province of Quebec. The number of occupied sites in the Great Lakes/St. Lawrence faunal province decreased by approximately 43% in Ontario over the period from 1995 to 2006.

1.3 Threats faced by the wildlife species

As identified in the federal recovery strategy, the primary threats to the Western Chorus Frog (GLSLCS) are habitat loss and degradation through urban development, intensification of agriculture, climate change, use of pesticides and fertilizers, the expansion and maintenance of linear infrastructures, as well as habitat succession. In addition to the threats identified in the federal recovery strategy, evidence of potential additional threats to the species have been found, including hydrological changes caused by American Beaver (Castor canadensis), a species native to the Great Lakes/St. Lawrence - Canadian Shield region, and habitat alteration by an invasive species, European Buckthorn (Rhamnus cathartica).

Urban Development
The loss and degradation of suitable habitat resulting from residential, commercial and industrial development are considered to be responsible for the bulk of the observed decline of this species. Urbanization near suitable Western Chorus Frog (GLSLCS) habitats also causes changes to hydrology, increased sedimentation and pollution, increased interactions with introduced animal and plant species or with native animals that benefit from contact with humans (e.g., raccoons), and effects on the local micro-climate. Collectively, these effects exert continuous pressures on habitats and individuals. Urban development also leads to habitat fragmentation, which further isolates local populations, thereby increasing the likelihood of a local population becoming extirpated. In the longer term, habitat fragmentation contributes to decreased genetic diversity and individual survival rates, which results in metapopulation declines and a loss of resilience, ultimately reducing the recovery potential of the species.

Intensification of Agriculture
Intensive agriculture leads to filling, draining and forest clearing, which results in habitat loss, degradation and reduced connectivity that have impacts on Western Chorus Frog (GLSLCS) populations. In the Montérégie region, most Western Chorus Frog (GLSLCS) populations found in agricultural landscapes are surrounded by annual crops, which involve such intensive agriculture practices.

In the Outaouais region, half of the Western Chorus Frog (GLSLCS) populations are in agricultural landscapes, where most of the fields are used to grow crops requiring less-intensive management practices. This has resulted in fewer changes to natural drainage patterns and facilitated the maintenance of Western Chorus Frog (GLSLCS) local populations. However, high market prices for annual crops are adding pressure to convert these fields to more intensive agriculture.

There is less information that establishes a direct link between agricultural intensification and declining Western Chorus Frog (GLSLCS) populations in Ontario. However, in the area east of Ottawa and north of Renfrew, Western Chorus Frog (GLSLCS) has disappeared from large areas where the only apparent change in land use was agricultural intensification.
**Climate Change**
Climate change can impact Western Chorus Frog (GLSLCS) habitat by affecting the duration of flooding of the temporary ponds in which the species breeds. Reduced accumulations of snow, faster spring snowmelt, and prolonged periods of drought would cause ponds to dry up more quickly and reduce the breeding success of the Western Chorus Frog (GLSLCS). Among other effects, climate change could also influence vegetation structure and composition, including plant succession patterns, which may in turn affect the Western Chorus Frog (GLSLCS). The magnitude of this threat, however, is unknown.

**Pesticides and Chemicals**
Pesticides have been observed to cause deformities and feminization of males in many amphibian species, including the Western Chorus Frog (GLSLCS), both in natural habitats and in laboratory studies. Non-selective pesticides (such as neonicotinoids) have also been shown to reduce insect prey populations. Neonicotinoids are generally used on agricultural lands, but they have also been detected in adjoining wetlands.

The use of the insecticide BTi to control insects that carry West Nile Virus is also increasing, owing to considerations related to public health and the comfort of urban residents. These pesticides have the potential to affect Western Chorus Frog (GLSLCS) local populations in or near urban areas.

Fertilizers also constitute a threat. In certain areas of intensive agriculture with few riparian buffer strips, the concentration of nitrates reaches levels recognized as problematic for the hatching and growth of amphibians, including the Western Chorus Frog (GLSLCS).

**Expansion and Maintenance of Linear Infrastructures**
The expansion of linear infrastructures such as roads, trails, and rights-of-way is a threat to the species throughout its range. In addition to resulting in direct mortality of individuals and the spread of invasive plant species, linear infrastructures can act as barriers to dispersal and thus contribute to habitat fragmentation. In Quebec, many breeding wetlands that became isolated because of man-made structures were abandoned after a few years, despite the continued presence of suitable habitat. Rights-of-way may also adversely affect individuals and render the habitat unsuitable (e.g., by creating slopes that are too steep, or by altering drainage patterns).

**Habitat Succession**
Although the Western Chorus Frog (GLSLCS) sometimes breeds in mature forests near hard edges, it prefers open habitats. When agriculture is abandoned on marginal land, succession towards more mature forests begins, which may affect the hydroperiod. Such changes in some of the breeding sites appear to have caused the extirpation of some local populations of the Western Chorus Frog (GLSLCS) in Quebec and Ontario. The importance of this threat is unknown and may be site-specific.

**Hydrological Changes Caused by American Beaver**
Landscape conversion and changes in hydrology due to American Beaver is a threat to the habitat of the Western Chorus Frog (GLSLCS). Beaver dams can cause changes to hydrology and loss of habitat required by the species for breeding, foraging and dispersal. When ephemeral wetlands used by Western Chorus Frog (GLSLCS) are converted to beaver ponds, predation and competition are increased. Changes to hydrology by the American Beaver can also drain adjacent wetlands used by the Western Chorus Frog (GLSLCS), making them unsuitable for Western Chorus Frog (GLSLCS) breeding. In addition, beaver clearings can change the microclimate of wetlands, having similar impacts to that of anthropogenic landscape conversion or climate change.
Invasive European Buckthorn poses a potential threat to the Western Chorus Frog (GLSLCS) in Ontario and Quebec. A study conducted in northeastern Illinois examined leaching of the compound emodin from European Buckthorn leaves in two ephemeral breeding pools that contained breeding Western Chorus Frog (GLSLCS). It was observed that the severity of embryo malformations increased with rising emodin concentrations. The increase in embryo mortality and malformation resulting from emodin may limit recruitment; thus, the compound has been linked to regional declines in amphibian populations including the Western Chorus Frog (GLSLCS). Emodin becomes a concern when it is released into breeding ponds in high concentrations. The geographic range of invasive European Buckthorn overlaps with the range of the Western Chorus Frog (GLSLCS) in Ontario and in Quebec, and may result in the degradation of suitable habitat and direct mortality.

1.4 Habitat and population status and trends

In both Quebec and Ontario, true population trends could not be calculated as no reliable estimates of numbers of individuals or density were possible with the available data. Instead, analyses in the change of suitable habitat and occupancy at the regional level were used as the best surrogate to estimate population trends.

In Quebec, changes in suitable habitat availability were determined by comparing observation data from 1991/92 and 2013/14 and the surrounding habitat types at those times. Occupancy was also assessed at the level of the metapopulation in Montérégie by comparing active breeding sites between years. Overall, the information available in Quebec was finer-scale than what was available in Ontario.

In Ontario, there is little information regarding Western Chorus Frog (GLSLCS) populations across its full range, owing to a lack of systematic surveys and monitoring of the species in the province. Therefore, no metapopulations have been delineated in Ontario. As a result, changes in species occurrence were based on information taken from surveys focused on larger, permanent wetlands that are not necessarily representative of habitat used by the Western Chorus Frog (GLSLCS). Data for analyses of suitable habitat were not available across the species’ range. Changes in land-use were based on coarse-resolution data and changes in wetland cover were based on surveys that would not capture the specific breeding habitats of the Western Chorus Frog (GLSLCS) (e.g., small, temporary wetlands). These analyses provide a general sense of population and habitat trends for the Western Chorus Frog (GLSLCS) based on best-available data, and should be interpreted accordingly.

The results of the analyses conducted for each province are presented separately for Quebec and Ontario.

Quebec

Suitable habitat for Western Chorus Frog (GLSLCS) in Quebec is limited in areas where the species occurs. Wetlands cover only a small proportion of the landscape in Montérégie (578 km² or 4.9%) and in Outaouais (3263 km² or 9.6%), and these are under pressure from development. In both the Montérégie and Outaouais regions, the predicted growth in households from 2011 to 2061 is greater than the provincial average.
In Quebec as a whole, habitat trends show a decrease in suitable Western Chorus Frog (GLSLCS) habitat of 13.1% (11.5 km²) since the early 1990s. This total is based on decreases of 7.4% (4.28 km²) between 1991-2014 in Outaouais and 23.6% (7.26 km²) in Montérégie from 1992-2013.

In the Montérégie region, more than 90% of the Western Chorus Frog (GLSLCS) historical range had been lost by 2009. In 2009, there were at total of nine metapopulations and some isolated populations. Recent information indicated that, by 2014, of these nine metapopulations, only six remained biologically functional, and threats to those metapopulations continue to persist on the landscape.

Within Montérégie, the greatest loss of habitat is occurring in the La Prairie metapopulation. The extent of suitable habitat in the La Prairie metapopulation decreased by 57.3% (4.16 km²) between 1992 and 2013, and further losses have been documented since 2013. As a result of habitat destruction, breeding ponds were also destroyed during that period. Most of the habitat and pond destruction has been due to residential development, despite the implementation of mitigation measures as part of the development. The most recent residential development is taking place at the core of the La Prairie metapopulation. Future phases of this development, should they proceed as currently understood, would adversely affect a large proportion of the remaining ponds through direct destruction of habitat, through proximity drainage, and/or by isolating local populations, threatening the viability of the metapopulation (i.e., making it more susceptible to extirpation). Breeding ponds outside of the proposed residential project are facing ongoing risks of additional development, which is compromising their viability. Some are already isolated and could not, by themselves, sustain the viability of the La Prairie metapopulation.

Although a conservation park is being established by the residential developer in La Prairie, it is unlikely to provide for the long-term viability of the metapopulation, due to the small area of the park’s intact habitat, the small number of active breeding ponds within the park, and the planned construction of a recreational path system within the park. Other measures taken by the Municipality of La Prairie and the developer to mitigate the impact of the residential development – such as creating artificial ponds, installing fences along developed areas and undertaking works outside of the breeding period – do not currently provide sufficient mitigation of the development’s impacts such that the long-term viability of the La Prairie metapopulation is provided for. These measures would not avoid the direct destruction of habitat and the resulting loss of connectivity among local populations, and would not offset those impacts such that there would be no increased risk to the long-term viability of the metapopulation.

Ontario

In Ontario, across the study area, 72% of pre-settlement wetland cover had been lost as of 2002. Analysis of data from 1995 to 2006 showed that the number of sites occupied by Western Chorus Frog (GLSLCS) decreased by approximately 43% in a large part of the species’ distribution in the province. This is supported by updated analyses showing that the probability of occurrence of Western Chorus Frog (GLSLCS) decreased by 2.6% per year on average from 1995 to 2014 throughout the species’ distribution in Ontario. Such a rate of decline is of concern from a biological perspective. However, analysis of the data also suggested that losses of suitable habitat were generally low. Overall, pressures on Western Chorus Frog (GLSLCS) habitat are expected to increase from threats including agriculture intensification, development associated with human population growth and the expansion of linear infrastructure.
2.0 Existing laws and conservation measures

Activities associated with the threats noted in section 1.3 above can be used as a basis on which to assess whether adverse effects to individuals, residences and habitat of the Western Chorus Frog (GLSLCS) are prevented by existing law. Those activities that affect habitat specifically are addressed in section 7.3 of the recovery strategy for Western Chorus Frog (GLSLCS).

Provincial and federal laws were examined to determine the extent to which they prevent the killing, harming, harassing, capture and taking of Western Chorus Frog (GLSLCS) individuals; damage or destruction of its residences; and destruction of its habitat. The analysis examined statutory definitions, the nature of prohibitions, offences and penalties, enforcement, limitations or exceptions to the legal instrument’s provisions, exemptions, discretion, permitting and the history of the legal instrument’s application. Provisions related to individuals, residences and habitat were examined separately. How each instrument applies in areas where the species is known to occur in Quebec and Ontario was considered. Non-legally binding measures were also considered in the analysis, where available. Laws examined in these analyses were identified by the Quebec and Ontario provincial governments, as well as by the Canadian Wildlife Service, Environment Canada.

Ontario

In Ontario, the Endangered Species Act, 2007 (ESA) is the primary piece of provincial legislation for the protection of species at risk that occur on non-federal lands. However, the Western Chorus Frog (GLSLCS) is not listed on the Species at Risk in Ontario list under the ESA, and thus the provisions of the Act do not apply. A suite of other instruments were examined for their potential to achieve protection for the Western Chorus Frog (GLSLCS) on non-federal lands. The Ontario Provincial Parks and Conservation Reserves Act, 2006 (PPCRA) and its associated regulations prohibit the disturbing, killing, removing, harming and harassing of a Western Chorus Frog (GLSLCS) individual; as well as the disturbing, cutting, killing, removing, harming and excavating of the residence of a Western Chorus Frog (GLSLCS) individual or of its habitat. PPCRA may protect Western Chorus Frog (GLSLCS) residences and habitat, since it requires that a work permit be obtained for construction, land clearing, and dredging or filling of shorelands. A permit may not be issued if the work threatens the environment, including lands, waters and watercourses, flora, and wildlife. Protection afforded by the PPCRA applies only within provincial parks and conservation reserves located on provincial Crown land, which account for 2.1% of the habitat around documented occurrences of Western Chorus Frog (GLSLCS) in the province.

Outside of provincial parks and conservation reserves, 96% of documented occurrences of Western Chorus Frog (GLSLCS) in Ontario are found on non-federal lands, where there are no instruments that explicitly prohibit the damage or destruction of Western Chorus Frog (GLSLCS) residences or habitat. Western Chorus Frog (GLSLCS) residences and habitat may instead be indirectly protected by prohibitions related to development in wetlands and adjacent lands. Developmental restrictions apply to Western Chorus Frog (GLSLCS) habitat when it occurs within Provincially Significant Wetlands or Provincially Significant Areas of Natural and Scientific Interest. Additional instruments offer similar conditional protections where activities likely to destroy Western Chorus Frog (GLSLCS) residences or habitat may be prohibited if they are found within specific designated Areas of Concern; if a work permit is not issued due to the identification of a threat to waters and watercourses, flora and wildlife; or if an

Western Chorus Frog residences consist of breeding sites within wetlands and hibernation sites in terrestrial habitats adjacent to breeding wetlands.
environmental assessment requires actions to prevent, mitigate or remedy the effects of a project on the environment.

While prohibitions may be present, applicable definitions, limitations, exemptions and opportunities for discretion inhibit the ability of all the instruments to prevent destruction of Western Chorus Frog (GLSLCS) habitat. Most instruments investigated had specific permitted uses and exemptions that allow for development and/or activities that may affect Western Chorus Frog (GLSLCS) habitat. In addition, the absence of Western Chorus Frog (GLSLCS) from the ESA may further limit the application of many of these instruments in situations where environmental conditions are considered and protection might otherwise be afforded. Outside of provincial parks and conservation reserves, limited protection to Western Chorus Frog (GLSLCS) habitat is provided in Ontario. Many instruments have exemptions and/or limited application that do not prevent Western Chorus Frog (GLSLCS) habitat destruction. None of the instruments assessed in Ontario included prohibitions that directly address activities associated with the intensification of agricultural practices.

Quebec

In Quebec, provincial laws prohibit, to varying degrees, the killing, harming, harassing, capture and taking of Western Chorus Frog (GLSLCS) individuals; damage and destruction of their residences; and destruction of habitat on non-federal land, but they do not meet all of the requirements set out in SARA. The Western Chorus Frog (GLSLCS) is listed in Quebec as a vulnerable wildlife species under the Loi sur les espèces menacées et vulnérables (LEMV). The LEMV, in tandem with the Loi sur la conservation et la mise en valeur de la faune (LCMVF), prohibits the damage and destruction of Western Chorus Frog (GLSLCS) individuals in the egg form of the individual’s life-cycle, and prohibits the capture and possession of other life stages of the species on non-federal land. Harming and harassing of Western Chorus Frog (GLSLCS) individuals is not prohibited by the LEMV and LCMVF, with the exception of hunting, and it is unclear if killing is prohibited otherwise. Although some parks and conservation areas prohibit the killing and collecting of animals within their boundaries, explicit restrictions on the killing, harming, and harassing of Western Chorus Frog (GLSLCS) individuals other than in the egg life-stage are limited throughout most of the province. In addition to the protection it provides to Western Chorus Frog (GLSLCS) individuals, the LCMVF prohibits the damage and destruction of nests. However, the term “nest” is not defined under the Act and it is not clear how the prohibition is implemented, or whether it applies to all of the biophysical elements and temporal aspects of the breeding and hibernation sites that constitute the Western Chorus Frog (GLSLCS) residence.

The majority of provisions that apply to individuals, residences and habitat of the Western Chorus Frog (GLSLCS) in Quebec appear to stem from requirements imposed by the province on individual land-development activities likely to cause habitat destruction. For example, the province or municipality may require the creation of green areas (e.g., urban parks, conservation areas and natural reserves), where prohibitions typically vary from site to site. The amount of Western Chorus Frog (GLSLCS) habitat found within such green areas is small relative to the total area known to be occupied by the species in Quebec. The province may also impose enforceable conditions as part of authorization certificates for individual land-development projects. There is evidence of that adverse effects have occurred in areas occupied by Western Chorus Frog (GLSLCS) despite the inclusion of enforceable conditions as part of authorizations for activities in these areas.

Under the Loi sur la qualité de l’environnement (LQE), authorization certificates are required for works that impact wetlands, installation of waterworks and sewers and for projects not specifically exempted
in associated regulation. Based on the authorization requests, an environmental assessment is carried out and the province determines the environmental measures required for the project to proceed. Negotiation can occur with the proponent when determining reasonable measures. In cases where development projects occur on municipal lands, municipalities will submit the authorization request, if it is required by the LQE. The municipality will ensure that the area is properly zoned under the Loi sur l’Aménagement et l’urbanisme. Once the works carried out under the authorization are complete, construction permits for other stages of the project (e.g. construction of houses) are then issued to developers or contractors by the municipality. Although municipal lands are sometimes sold to developers or contractors at this point, municipalities may still have obligations to ensure compliance with conditions set out in the authorizations (e.g. environmental monitoring, compensation).

Authorization requests can also be submitted directly by project proponents or private land owners.

Measures taken by the Municipality of La Prairie and the developer to mitigate the impact of the residential development have been considered, but are unlikely to provide for the long-term viability of the metapopulation affected by the development. One of the conditions put in place in order to proceed with the current residential project at La Prairie was to create a conservation park. Surveys have shown that the boundaries of the park include less than one third of the active breeding ponds surveyed in the La Prairie metapopulation. In addition, the effectiveness of mitigation measures, such as the creation of four artificial ponds to compensate for habitat destruction associated with the development has yet to be determined. Field observations conducted in 2015 suggest that two of the created ponds do not possess the necessary biophysical attributes of Western Chorus Frog (GLSLCS) habitat. Other mitigation measures, such as the installation of fences, undertaking work outside the breeding period and conducting the work in phases, have not effectively reduced threats of the development to Western Chorus Frog (GLSLCS) individuals or their residences, and do not effectively address the loss or degradation of habitat in the La Prairie metapopulation. Furthermore, additional mitigation measures being contemplated by the Municipality of La Prairie for the conservation park, such as the installation of wildlife corridors and control of beaver and invasive plants, would not adequately reduce the threats of this development.

**Federal land**

The Western Chorus Frog (GLSLCS) has been listed under Schedule 1 of SARA since 2010. Upon listing, SARA prohibits the killing, harming, harassing, capture and taking of individuals and the damage or destruction of residences of one or more individuals of the Western Chorus Frog (GLSLCS) that occur on federal land in Canada. Federal lands comprise an estimated 2.8% and 8% of the total known Western Chorus Frog (GLSLCS) habitat in Ontario and Quebec, respectively.

Unlike individuals and residences, the protection of a listed species' habitat on federal land is not automatic under SARA. The habitat protection assessment of federal lands considered only provisions in and measures under existing Acts of Parliament. On Parks Canada Agency (PCA) lands, PCA is responsible for habitat protection. Western Chorus Frog (GLSLCS) habitat overlaps with PCA lands in national parks and national historic canals in Ontario. The Canada National Parks Act, in conjunction with its associated regulations, prevents the destruction of habitat in national parks. The Department of

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3 The assessment did not consider laws that apply only on “Indian Act” lands. While “federal lands” under SARA include “lands set apart for the use and benefit of a band under the Indian Act” (“Indian Act lands”), this assessment of federal laws did not consider laws as they apply to those lands.
Transport Act and the Historic Canals Regulations include provisions against the destruction of habitat in national historic canals, but measures available are not equivalent to those required under SARA.

For all other federal lands, a total of eight laws were identified as both applying to federal lands in the geographic area and ecosystem types relevant to the Western Chorus Frog (GLSLCS); and relating to the regulation of activities identified in section 7.3 of the recovery strategy that are likely to result in the destruction of Western Chorus Frog (GLSLCS) critical habitat. The assessment then considered whether these eight laws included mandatory, enforceable prohibitions against the destruction of the species’ habitat. Of the eight laws assessed, none were found to include mandatory, enforceable prohibitions against the destruction of Western Chorus Frog (GLSLCS) habitat on federal lands. Two of the eight laws that applied to this species’ habitat also did not include prohibitions that were supported by offences, penalties and enforcement provisions. The remaining six laws, which included prohibitions capable of preventing at least some activities likely to destroy Western Chorus Frog (GLSLCS) habitat on federal land, were found not to be mandatory in their application. Of the eight laws assessed, none were found to include mandatory, enforceable prohibitions against the destruction of the species' habitat on federal lands to the degree that is required by SARA.

3.0 Assessment of imminent threat to survival or recovery

This assessment is based on the interpretation of the term “imminent threat” as a threat that would render the survival or recovery of a wildlife species impossible or unlikely without immediate intervention.

Assessment of imminent threat to survival

The final federal recovery strategy for Western Chorus Frog (GLSLCS) affirms that individuals of Western Chorus Frog (GLSLCS) that are capable of reproduction are available now and will continue to be available in the foreseeable future to sustain the population or improve its abundance. Monitoring activities conducted in Quebec and Ontario show that, despite significant declines in the number of breeding wetlands or their occupancy, individuals remain in a number of locations throughout the range.

This indicates that there is no imminent threat to the survival of the Western Chorus Frog. Information received in undertaking the present threat assessment lends further support to this conclusion. The information demonstrates that, although the area of occupancy has declined, the species continues to be found in many locations throughout its current range in Ontario and Quebec. It is widely distributed in southern Ontario and metapopulations of Western Chorus Frog (GLSLCS) are well-documented in Quebec. As noted earlier in this document, metapopulations are groups of connected populations that play an important role in maintaining genetic diversity and providing resilience from natural or anthropogenic disturbances.

Although there are general trends and pressures, the Department has no specific knowledge of a single activity or a collection of specific activities that would render the survival of Western Chorus Frog (GLSLCS) impossible or unlikely across its entire range, such that it would no longer exist anywhere in Canada, where the activity or activities would be undertaken in the short-term such that immediate intervention would be required. Based on this information, it can be concluded that the Western Chorus Frog (GLSLCS) is not facing an imminent threat to its survival.
The rest of this document considers whether there is an imminent threat to the recovery of Western Chorus Frog (GLSLCS).

Assessment of imminent threat to recovery

The population and distribution objectives established in the recovery strategy for the Western Chorus Frog (GLSLCS) set out the basis for achieving a recovered state for the species. Accordingly, the assessment of imminent threat to recovery considers whether these objectives can be met. The objectives are:

- Over the short-term (2015-2025): maintain the areas of occupied suitable habitat as well as the breeding population level within each local population, and, where a metapopulation is present, maintain connectivity among the local populations constituting the metapopulation.

- Over the long-term (2015-2035): ensure the viability of each local population and of metapopulations, where present, by increasing the areas of occupied suitable habitat, the breeding population level within each local population, as well as the connectivity among the local populations constituting a metapopulation. Also, where technically and biologically feasible, restore historical or extirpated local populations or create new habitats.

The recovery strategy for the Western Chorus Frog (GLSLCS) identifies several threats to the recovery of the species. As described in previous sections of this document, the information gathered for this assessment shows that populations and the habitat of the Western Chorus Frog (GLSLCS) are continuing to decline in Ontario and Quebec. All of the identified threats are contributing in varying degrees to these declines. However, as described earlier, only the identified threats that would render the recovery of Western Chorus Frog (GLSLCS) impossible or unlikely without immediate intervention are imminent threats.

In the time available for the completion of this threat assessment, including associated consultations, the Department found only a single incident where it considers recovery to be unlikely without immediate intervention. Although there are general trends and pressures, the Department has no other specific knowledge of a single activity or a collection of specific activities that would render the recovery of Western Chorus Frog (GLSLCS) impossible or unlikely, where the activity or activities would be undertaken in the short term, such that immediate intervention is required. Information was provided to the Department indicating that other areas within the range of the Western Chorus Frog (GLSLCS) in Quebec may become subject to activities that might constitute an imminent threat; however, currently, there is no evidence that immediate intervention is required. Requests for information on other development projects in the species’ habitat were made to the provincial government but new information has not been provided. The Department will continue to assess these situations.

As set out in the population and distribution objectives for the Western Chorus Frog (GLSLCS), the recovery of the species depends on, among other things, maintaining the connections among local populations within existing metapopulations in the shorter-term, and, in the longer-term, ensuring the viability of existing metapopulations.

The planned future phases at La Prairie, as currently understood, would adversely affect a large proportion of remaining habitat that is needed to maintain connectivity among local populations in the short-term and the viability of the La Prairie metapopulation in the long-term. Moreover, measures
taken by the Municipality of La Prairie and the developer, including the conservation park, do not sufficiently mitigate the impacts of the development to provide for the long-term presence of the La Prairie metapopulation.

The residential developer at La Prairie has signed an agreement to not proceed with clearing activities for the future phases of the development until the earliest of 1) such time as the opinion on imminent threat has been formed or 2) December 22, 2015, the date on which the opinion is required to be formed. Therefore, these activities could adversely affect Western Chorus Frog (GLSLCS) habitat immediately following the announcement of the opinion on imminent threat, or on December 22, 2015.

Based on the analysis of legal instruments, there are none available that meet all the requirements set out in SARA for preventing activities that are detrimental to the species, with only minor exceptions that apply to small proportions of suitable habitat for the Western Chorus Frog (GLSLCS) on provincial or federal crown land. These exceptions do not apply to the La Prairie project. While some legal instruments have mechanisms that could be used to prevent some activities detrimental to Western Chorus Frog (GLSLCS), such mechanisms are discretionary and/or limited in their application such that they cannot currently be relied upon to meet SARA requirements.

4.0 Conclusion

As stated in the previous section, a threat that would render the recovery of Western Chorus Frog (GLSLCS) impossible or unlikely without immediate intervention is an imminent threat. Also as stated, the population and distribution objectives established in the recovery strategy for the Western Chorus Frog (GLSLCS) set out the basis for achieving a recovered state for the species.

As currently understood, based on available information, planned future phases of development at La Prairie would take place in habitat needed to maintain the viability of the La Prairie metapopulation. The planned future phases, as currently understood, would result in the loss of connectivity among remaining populations and the direct loss of breeding ponds, and the areas remaining after such development are unlikely to sustain the viability of the metapopulation. Therefore, based on the available information, it is concluded that the viability of the La Prairie metapopulation is threatened in the short-term such that immediate intervention is required.

Based on the information reviewed and analyses undertaken as part of this assessment, including the analyses set out in the previous section, the recovery of Western Chorus Frog (GLSLCS) would be unlikely if the future phases of the La Prairie development were to proceed as currently understood, as such development would prevent the population and distribution objectives for the species from being met. Given that the development could occur in the short-term, it is concluded that the future phases of the La Prairie development constitute an imminent threat to the recovery of the Western Chorus Frog (GLSLCS).

The information received indicates that land development is also adversely affecting other metapopulations of the Western Chorus Frog (GLSLCS), and may be affecting local populations across its range. However, none of this information indicates that the viability of other local populations or metapopulations is threatened in the short-term to the extent that the population and distribution objectives for Western Chorus Frog (GLSLCS) could not be met.
Other threats are contributing to declines in Western Chorus Frog (GLSLCS) populations and habitat. However, none of the information received indicates that these threats would prevent the population and distribution objectives for Western Chorus Frog (GLSLCS) from being met in the short-term. Therefore, it is considered that they would not render the recovery of Western Chorus Frog (GLSLCS) impossible or unlikely without immediate intervention, and thus they are not considered to be imminent threats.

The opinion formed in 2014 was based on consideration of threats to the habitat of the Western Chorus Frog (GLSLCS) in relation to the comparatively small amount of habitat specifically affected by the residential development in La Prairie. The conclusion of the attached threat assessment, which, as noted above, included consideration of all relevant information obtained by the Department, is based on a greater appreciation of the importance of connectivity among local populations within a metapopulation.
Figure 1. Western Chorus Frog faunal provinces and observations of the species in the Carolinian and the Great Lakes/St. Lawrence faunal provinces (adapted from COSEWIC 2008). Observations above the grey shared area fall in the Canadian Shield faunal
Figure 2. Historical and current ranges of the Western Chorus Frog (GLSLCS) in the Outaouais and Montérégie regions of Quebec (unpublished, Ministère des Forêts, de la Faune et des Parcs 2015).
Appendices

- Western Chorus Frog (GLSLCS) Science Assessment
- Western Chorus Frog (GLSLCS) Protection Assessment
- Western Chorus Frog (Pseudacris triseriata) and Boreal Chorus Frog (P. maculate): clarification concerning the wildlife species listed under SARA in light of recent taxonomic interpretations