Wildlife Preservation Canada - Native Pollinator Initiative

Community Science Manual

A manual designed in support of organizations interested in developing and delivering bumble bee monitoring programs on their properties.

2025 update

TABLE OF CONTENTS

Wildlife Preservation Canada has been developing and delivering bumble bee community science programs since 2015. Expansions to our community science capabilities in 2025 have been made possible through funding from the RBC Foundation. Thank you to all our community science partners, and to all current and past funders for supporting this work.

If you have any questions or concerns, please reach out to pollinators@wildlifepreseration.ca

All supporting documents referred to herein are uploaded to a Google Drive folder found HERE

Importance of Bumble Bee Community Science

Pollinator decline is an increasing concern across Canada, with mounting evidence of the potential collapse of many populations of once-common bee (Hymenoptera: Apoidea) species. Bees are extremely important for their ability to pollinate native plants and their contribution to ecosystem services such as crop production. In particular, a quarter of our bumble bees have been assessed to be at risk, with two species currently listed as endangered under the Canadian Federal Species at Risk Act (the rusty-patched bumble bee and the Ashton cuckoo bumble bee). Monitoring for species such as these is critical in understanding the status and range of our bumble bee species and is an integral part to their conservation. Community science programs provide invaluable site-specific data, contribute to a long-term dataset in Bumble Bee Watch, aid in locating rare and at-risk species, and overall help fill in location gaps across Canada.

Monthly Tasks

Below is a monthly breakdown of the tasks generally included in the development and delivery of Bumble Bee Watch community science survey programs. This breakdown is meant to be a general guideline — newly-developed programs are likely to have more tasks in the earlier months of the year. If you intend to develop and deliver a bumble bee survey program and would like help, contact Wildlife Preservation Canada's (WPC) Native Pollinator Initiative (pollinators@wildlifepreservation.ca) in the early months (January and February). We are happy to help guide you along the way!

January

- Select options for your community science survey location(s) (Page 10).
- Can begin preparing your final report (Page 17). See Final Report folder for examples prepared by WPC in past years. Please attempt to complete this report and have it sent to WPC by March 1st, following your program year.

February

- If required, apply for permit(s) (permit requirements for potential sites may differ, so discuss requirements with site staff).
- Arrange training date(s) for program locations (Page 11).
- Send final report to WPC and volunteers.

March

- Purchase or replace materials for a storage bench/equipment box (Page 7).
- Prepare a survey map in consultation with property staff (Page 10).
- For repeat programs, update training materials from the previous year's program (see **Program Documents** folder for examples).
- Answer emails from volunteers who participated in previous years (if questions arise from sending out the **Final Report** in February).

April

- Create a sign-up method for training and survey dates (Page 13).
- Start advertising for training (Page 11) (see **Advertising** folder for examples).
- Regularly check for emails and messages on social media platforms from past/potential participants.

May – June

- Put together volunteer packages for the training workshop (Page 11).
- On (or before) training day, set up storage bench and deliver workshops at selected locations (Page 12) (see **Workshop Presentation** folder for examples).
- Regularly check for emails and messages on social media platforms from program participants.

July – September

- Regularly review sign-ups and send periodic emails to workshop attendees to encourage registration for independent survey site sets/routes.
- Follow up with participants about overall program progress, ask volunteers and supervising staff to write blog(s) about their experience, can also post updates and photos in Facebook groups and through other media (Page 14).
- Regularly check for emails and messages on social media platforms from program participants.

October – November

- Follow up with volunteers via email to make sure all observations have been submitted, and that data sheets have been mailed/emailed to your organization, or directly to WPC's head office (if applicable).
- Prepare and send out a feedback survey for staff and volunteers (Page 15).
- Prepare volunteer appreciation packages for program participants (see **Certificate of Appreciation** folder for examples). These can be printed and mailed out or can be emailed (Page 16).

December

- Schedule a meeting or phone conversation with WPC staff to discuss how your program went, what you need to prepare a final report, and to discuss recommendations for programs in future years (Page 15).

Before You Begin

- Determine who the program's contact person or people will be. This person will be responsible for any correspondence with WPC and for volunteer assistance on and off site. It is highly recommended to have multiple program contacts to cover all the site's hours of operation, and to help share the load.
- Decide on program design and structure, including objectives, methods, and deliverables. Ensure you to outline the type and amount of support you would need to run an effective program and discuss the feasibility of obtaining that support both from within your organization, and from partner organizations (including WPC).

Questions to consider

- What are your goals for this program?
  - Are you looking to monitor bumble bees long term?
  - Are you looking to just get a species list for your property?
  - What kind of data do you want, and what are you using this data for?
- Will participation be free for volunteers?
- Where will you keep the gear? Will it be directly accessible by volunteers?
- Where will your survey sites be located? Are they all easily accessible?
- **Do you need a permit to survey on the land or at the sites you have planned for your project?**

When might permits be necessary?

Depending on the location and survey method of your community science project, permits may be necessary in the following regards:

- **Accessing the property**. If your program takes place on private land, specifically within a Provincial or National Park, Conservation Area, or similar jurisdiction, you will likely require a research permit from the hosting organization. This permit will grant your program participants access to the property to conduct surveys.
- **Capturing bumble bees** (see 'Program Format' in 'Developing a Survey Protocol' below for more details). If your survey methods involve capturing bumble bees with nets, this activity may be regulated by the site authority and covered under the same property access or research permit mentioned above. Whether you choose to allow capture or rely on photographic identification only may depend on the specific conditions and restrictions outlined in that permit.
- **Species-at-Risk**. Certain properties may be home to species-at-risk, including some bumble bee species. In such cases, additional permits may be required under provincial or federal species-at-risk legislation, depending on (1) the status of the species in your province (these vary across jurisdictions), (2) your survey method (i.e., capture vs. observation/photo-only), (3) whether the activity could be interpreted as disturbing, handling, or harassing the species or its habitat.
  - Provincial Requirements: provinces protect specific bumble bee species under

their own conservation laws. If a species is listed under provincial legislation and is prohibited from being disturbed or captured, you may need an additional permit — especially if your method involves handling bees.

- Federal Requirements (Species at Risk Act – SARA): At the federal level, the Species at Risk Act applies only to species listed as Threatened, Endangered, or Extirpated.
  - Species listed as Special Concern (e.g., Yellow-banded Bumble Bee or American Bumble Bee) are not subject to SARA's general prohibitions.
  - SARA protections apply primarily on federal lands, unless a "safety net" provision is invoked.
- If your survey area is known or suspected of hosting federally or provincially protected species, it is important to review these designations during permit planning.
- However, if your project uses non-invasive methods (e.g., photographing without capturing or handling), or if participants refrain from capturing protected species (while capturing others), you may not require additional permits under species-at-risk legislation. In such cases, it is strongly recommended that any sightings of protected species be reported immediately to the appropriate landowner or managing authority.

For more information on permit requirements, please contact pollinators@wildlifepreservation.ca.

Developing a Survey Protocol

There are a variety of components to consider when designing a survey protocol for your program, and this will depend on your program goals and overall accessibility.

Timing

Bumble bees emerge in early spring (mid-late April) and are active until early fall (late September). It is most optimal to run community science programs from late June to mid-September. Worker bees will be active and easier to find (than queens in the spring) in this timeframe. Sampling workers and males, instead of queens, also lowers the risk to bee populations during surveys.

In terms of timing for individual surveys, it is optimal that surveys be no less than 30 minutes, with the maximum time is up to you (our suggestion is no longer than 2 hours). Keep in mind that longer minimum times may deter some volunteers from signing up. A factor to consider is how many sites you have, either increasing the survey duration (i.e. up to 2 hours) if there are few sites or decreasing the duration (i.e. 30 minutes to 1 hour) if there are many sites. Survey duration will depend on the site set that is surveyed, and how many bees are encountered at the site. A "new" survey begins when a new site is surveyed (and therefore should have a new data sheet associated).

Program format

There are two main ways in which volunteers can conduct surveys:

1. **Catch with nets, vial, and photograph**

   Volunteers can physically catch bees from flowers using aerial nets and then place each individual into their own vials. Bumble bees can be swiped from small trees, shrubs, and ground flowers. See photos below for how to vial a bumble bee. Photographs of bees can be taken directly through vials, but the vialed bee will likely be very active (often making photos blurry). A method that can be added to the protocol is cooling the bees to make them easier to photograph and identify as they will be less active. Volunteers can carry small, insulated lunch or cooler bags with ice packs (refer to Equipment and Materials), adding vialed bees to their bag. It may take 10-15 minutes to cool the bee down sufficiently for photographing.

   In terms of release, you can decide to have volunteers either catch and release as they go throughout their survey, or to release all bees caught at one site at the end of their survey. Size of sites may also be a consideration into release protocol. For example, if volunteers release bees as they go is, there may be a higher risk of re-catching the same specimens (especially if the site is small). If you choose to have your volunteers cool down bees, it is likely more optimal to have them keep bees until the end of the survey to ensure sufficient cooling time for later photographing. Additionally, if volunteers are instructed to release all captured bees at the end of surveys, more vials should be accessible to volunteers (as vials will not be reused during surveys).

2. **Just photograph**

   Volunteers can simply photograph bees directly on flowers when foraging. This method eliminates handling and close contact. However, photographing active bees can be challenging at times as it may require individual bees to be followed to more than one flower, and quick reaction times to take photos.

Note: With either method, it would be valuable to include a photography tips section in your survey protocol. The quality (e.g. resolution and angles taken for identification) of photos uploaded to Bumble Bee Watch is integral to proper species verification. WPC already has one developed and is accessible in the **“Survey Protocol”** folder within the **“Program Materials”** folder.

Catching and vialling bumble bees

A. If you see a bee, try to anticipate its movement and catch it using the netting techniques you learned at hands-on training. If the bee is on the ground, place the net over top of it and ensure the edges of the net are firmly sealed to the ground, so the bee can't escape out the sides. If the bee is on a taller plant, use a quick sweeping motion, following through with a few swipes afterwards to make sure the bee moves to the end of the net, and flip the net over the rim to make a barrier.

B. Once you have the bee in your net, lift the end so it flies upwards and close your hand around the net below the bee. If you are having difficulty maneuvering with a bee that you caught in the air, placing the net on the ground first may help.

C. Hold the cap of the vial in the same hand as the net. Hold the bottom of the vial in the other hand.

D. Slide the vial into the net, keeping an eye on the bee at all times. Make sure to keep your hand at the bottom of the vial and hold the net tight around the sides of the vial with your other hand. Slowly pull the net tighter around the vial so the bee has less room to move around, until you can place the vial on top of the bee safely.

E. It can be easier to cap your vial if it is close to the edge of the net – hold the net tight over the vial opening with one hand, and slide the vial to the edge with the other hand from inside the net.

F. Slip the hand with the vial cap into the net, and carefully slide the cap on top, keeping it level. Press down until you hear the click of the cap sealing.

G. Success! Use a pen or pencil to write a “Bee ID” onto the masking tape label on your vials if you are carrying multiple bees in your cooler. This will help you to keep track of each bee and to match them to the correct row in your datasheet. You can use numbers, letters, or any method that makes sense to you to organize your bees.

H. Place each vial in your cooler bag for at least 10- 15 minutes, jostling the bee(s) as little as possible. You may release multiple bees at once if you are still within the same flower patch.

Data

A variety of information can be recorded from each survey conducted by your volunteers. It is optimal to organize a data sheet that can be printed and provided to volunteers for ease of use. See **Data Sheets** folder for examples.

Required data:

- Information relating to the survey
  - Start/end time for survey
  - Surveyor(s) names
  - Survey site

Optional data:

- Weather (temperature, humidity, wind etc.)
- Specific GPS coordinates where the volunteer is surveying within a site, if focusing on one area
- You may want volunteers to try to record flowers that bees were caught foraging on/photographed on

Each individual bumble bee caught should be recorded in a way that allows volunteers to keep track of its associated photos to be uploaded to Bumble Bee Watch later. If netting bees, using small pieces of masking tape on each vial, volunteers can write a unique identifier on each vial after catching an individual. Then, to keep photos and bees organized, take a photo of the “Bee ID” label before you take photos of that bee, so that you know which ID belongs to which photos, in order by time taken.

Provide a space for volunteers to drop off their data sheets or allow them to scan/photograph them and email them to your organization.

Endangered species clause

A clause regarding the finding of endangered species should be included in your survey protocol. For example, if a rusty-patched bumble bee or an Ashton cuckoo bumble bee is captured it will be released unharmed immediately following species identification and reported within 48 hours to the Program lead. The Program lead can consult with us if they are unsure how to report the information.

Develop a Safety Plan

Like most, these programs carry risks for participants. WPC requires all volunteers to sign a waiver and participate in comprehensive safety training before being permitted to conduct surveys. Please ensure you have referred to safety guidelines for your organization, and any government safety precautions, including (if applicable) COVID-19 provincial mandates specific to your area.

Common hazards include:

- Bee stings: allergic reactions, anaphylaxis
- Exposure to hot temperatures: dehydration, sunburn, heat exhaustion
- lips, trips, falls, cuts and scrapes, dislocated or broken bones, concussions
- Wildlife encounters (site-dependent)
- Aggressive person encounters (site-dependent)

You may also want to consider your comfortability in allowing volunteers to survey independently, versus requiring a minimum of two people to survey together for safety reasons. This decision may be influenced by your property type and on-site staff capacity to respond to any emergencies.

COVID-19 considerations:

Depending on COVID-19 provincial mandates at the time, you may want to consider things such as masking, social distancing requirements, and the availability of additional materials in your storage bench (e.g. hand sanitizer).

Note: Refer to the "**Health and Safety**" section of the example **"Survey Protocols"** in the **"Program Materials"** folder for more details on outlining potential risks to participants.

Equipment and Materials

For new programs, all equipment and materials must be purchased. The equipment and materials listed below are suggestions and only refer to materials needed for surveys, not workshops. Many of the items can be sourced from alternative producers and distributors, and some alternatives might be more suitable for certain organizations or to support specific program design and structure. Additionally, depending on the survey protocol you decide to develop, some items may not be applicable.

In 2025, total equipment and materials costs to start a program were approximately $1300. Materials needed are listed below, and equipment sourcing links and estimated costs are provided here.

Equipment and materials for storage bench

Item	Quantity needed	Usage
Lockable Storage Bench (~454 L)	1	To store all equipment for volunteers; ideally should be lockable
Plastic tote	1	For storage of papers and other items
Student insect nets	2 per site set/route	To collect bumble bees; only 2 needed per route during regular surveys but more may be needed for volunteer training
Collection vials	Minimum 20 snap-top vials (12 dram volume)	For collection of bumble bees; one bee held per vial
Small cooler bag	5-10	To hold vialled bumble bees. Can be supplied or volunteers can be asked to bring their own
Small ice packs	Enough for all cooler bags	To put in the cooler bags. Can be supplied or volunteers can be asked to bring their own
Combination lock	1	To secure equipment in storage bench
Safety vests	2 per site set/route	Especially if surveys will be conducted along roadways
Clipboards	1 per site set/route	To hold survey protocol, site map, permit, data sheets, bumble bee ID card)
Clear sheet protectors	Depends on # of participants	Optional; weather protection for pages to be included on clipboard
Miscellaneous office supplies	Depends on # of participants	Pencils, sharpies, masking tape

Cleaning and disinfecting program equipment

Proper cleaning and disinfecting of equipment is important to prevent spread of parasites and/or diseases in the course of a community science program. Materials that come in to contact with bumble bees should be cleaned as described below.

Survey vials

Vials can get dirty relatively quickly. Clear vials are important for photos, and clean vials help reduce the chances of pathogen and disease transmission between individuals. Vials should be cleaned and disinfected **before program start, ideally once throughout the season, and again at the end of the season.** If you have vials split into Ziploc bags between sites, you also can rotate highly used vial bags ("popular" sites), with less used vial bags (less "popular" sites).

Process:

- Fill a sink with warm water.
- For any vials that are extra dirty or have fecal matter in them, it is best to put them in a soap bath first. Add a bit of dish soap to the water and let the vials sit for 5 minutes. Then drain and refill with new water.
- Add bleach to the new water, following the dilution instructions on the container to create a disinfecting bath. you on how much to add/dilution requirements for disinfecting. ***Note:*** Bleach used in this step should specifically be a "disinfecting bleach" that has a higher percentage of sodium hypochlorite than regular household bleach.
- Using dish gloves and a bottle brush, clean out the vials and lids in the bleach water.
- Let the vials sit in the bleach water for roughly 10 minutes (max 30 minutes). Make sure the vials are completely submerged in the bleach bath. Note: Do not let them sit too long or it will cause cloudiness.
- Drain and refill the water, and let the vials and lids sit in a rinse bath for at least 5 minutes. Make sure the vials are completely submerged in the rinse bath.
- Drain the water and rinse the vials and lids as you remove them.
- Lastly, dry the vials by standing them up or laying them on their side, but you will likely need to hand dry them before surveys.
- Add tape labels to each vial.

Note: It is easiest to remove the tape labels once the vials have soaked already (either after the bleach bath or rinse bath), rather than trying to remove them prior to soaking them.

Additional

Insect nets

Nets will be disinfected **prior to the program start and at the end of the season**. Nets that appear particularly dirty can also be disinfected mid-season

Process:

- Remove the net ring from the net handle.
- Fill a sink with water.

- Follow the instructions on the bleach provided to you on how much to add/dilution requirements.
- Let the net bags sit in the bleach water for roughly 20 minutes, make sure the net bag is completely submerged (max 40 minutes).
- Drain and refill the water and let the equipment sit in a rinse bath for 10 minutes. Make sure the net bag is completely submerged.
- Hang the net bag to dry, for example from the shower head or faucet, or outdoors if possible.
- Reattach net ring to net handle.

Site Selection and Site Maps

Tips on property/location selection

- Use locations that are easily accessible for organizational staff and volunteers alike; consider how far volunteers need to drive/walk to get to the site.
- Choose properties that support bumble bee activity (e.g., wildflowers are plentiful) in locations that are easily accessible to participants (e.g., along a pathway or trail).
- Determine if a permit is required for the proposed locations. If a permit is required, ensure to apply well in advance of your program's start date (minimum 3 months in Ontario).

There are a few ways to designate sites on your property:

- ***Site sets*** –where you group sites together (2-4) that are nearby, or are different in habitat type, and volunteers survey within a site set, or survey the whole site set.
- ***Trail loop*** –where volunteers survey along a trail, walking slowly, or (preferably) timed (i.e 30 mins, 1 hr, depending on trail length).
- ***Site list*** –where simply a list of sites is identified and provided to volunteers to choose from.
- ***Free roam*** –this is where sites are not designated, and volunteers can roam freely on your property. This is not optimal if you'd like to monitor long-term, but if you have small space or just want a species inventory this may be a consideration. Designating sites can help identify optimal habitat where bumble bees are likely to be and avoid human traffic in areas you do not want disturbed.

Your selection will likely depend on your knowledge of the area and the type of data you hope to collect. Additionally, in any case, you may need to coordinate with volunteers so that all sites are surveyed (i.e., request that site X be surveyed next, as it has not been surveyed yet).

Examples of maps from WPC's Ontario and Alberta programs can be found here.

- Create site maps in consultation with all applicable property staff (i.e., ecologists, natural heritage staff, etc.).
- Where possible, try to include a variety of habitats and a variety of types of sites (i.e., open meadow vs woodlands, trails vs open areas).

Note: The number of site sets or routes is likely to depend on the amount of equipment available to volunteers (i.e., how many volunteers can survey at one time), but will also depend on the level of participation you anticipate.

Planning Your Volunteer Training Workshop

- Depending on the availability of participants and staff, you may choose to deliver a single workshop with a presentation followed by hands-on training, or you may split the two up into different sessions. The structure of your workshop(s) is likely to depend on the space you have access to (i.e., do you have a classroom space for teaching?).
- Try to choose a hands-on training date during the last two weeks of June or later
  - More worker bees should be active, lowering the risk to volunteers and bee populations during surveys
- Book/confirm a training space (for presentation portion) that is equipped with a projector
- Before the workshop, confirm a location on-site where the storage bench (containing field gear and extra materials) will be kept, and set it up prior to beginning the presentation
- You will want to advertise your training workshop in advance through whatever platforms you have available (e.g. email lists, social media). See section below and the **Advertising** folder for examples. It is your choice on whether to have registration required for the training workshop (see Volunteer Sign Up).

Advertising

Advertising often determines volunteer participation and is key to program success. Advertising should be done as required – more targeted advertising will be needed for programs in areas far from population centers. To advertise, post through all available social media channels, program location channels, and target groups that have individuals that would want to participate (i.e., Field Naturalists groups near the location, photography clubs, nature clubs, colleges and universities, WPC, etc.). Traditional media (i.e., radio, newspaper) can also be utilized as a means of advertising. See **Advertising** folder for examples.

For advertising through WPC's website, Facebook, Twitter, and Instagram, posts should be directed to pollinators@wildlifepreservation.ca.

Training Packages

The training packages that you supply to your participants can be unique to your program/organization, but they should always include important program protocols, volunteer waivers, and important contact information. Below is a list of material that WPC supplies to each participant in Ontario at the community science training workshop(s). These materials are available to you in **"Educational Resources"** in the **"Program Documents"** Folder. Any questions regarding these materials can be directed to pollinators@wildlifepreservation.ca. It may also be beneficial for your organization to create an accessible folder (i.e., through Google Drive) for volunteers to access extra resources.

Example WPC Volunteer Package Contents

- Right side of folder (education materials):
    - ID Card: Bumble Bees of South-Central Ontario
- Left side of folder (program-specific materials):
    - Bumble Bee Community Science survey protocol (modified annually)
    - Site map (program-specific)
    - Data sheet(s)
    - Volunteer waiver(s): You should have your own waiver for volunteers to fill out for training and surveys.

Note: Make sure to print enough documents for your participants and extras for the clipboards in the storage bench (outlined below under "**Training Day**", "**Tentative Schedule for Single Day Training**", 1b).

Volunteer Training Day

Depending on whether you have chosen to hold volunteer training on a single day or to spread it out over multiple days, this schedule may be adjusted to suit your needs. The presentation portion can take between one and three hours, and the hands-on survey portion can also take between one and three hours. The duration of your workshops will depend on a number of things, including staff and volunteer availability, and the depth of the information provided. You will need to consider in advance whether you want volunteers to bring some of their own materials (i.e cooler bag, ice packs), or whether these will be provided on site. If you are providing, make sure to freeze icepacks the night before the training workshop. If you expect volunteers to bring these items, be sure to include these details when advertising.

Tentative schedule for single day training

1. Arrive early to program location to set up storage bench.
    a. Storage bench must be built and placed in a spot that is accessible to volunteers, with a combination lock. When possible, place the storage bench in an area where it will be somewhat protected from the elements.
    b. All clipboards (# of clipboards needed = # of site sets or routes) should have copies of the permit (site-specific), site map, survey protocol, bumble bee ID guide, and data sheets. Replace old materials with updated ones as required. (Note: use sheet protectors for clipboard copies).
    c. Place extra copies of data sheets, site maps, survey protocols, etc., in the plastic tote container in the storage bench. These might need to be replenished

throughout the season.

   d. Organize the rest of the equipment in the storage bench (safety vests, safety vests, bags of vials, nets).

2. Scout program property (with advice from staff on-site) for the best location for hands-on portion of the training. This is an important step if you have not been to the property, or if you have not visited it recently.
3. Set-up presentation (using laptop or USB), training packages, and outreach materials (i.e., pinned specimens) in the area where the presentation portion of the training will occur.
4. Sign-in participants as they arrive, handing out training packages and pens. Instruct participants to begin filling out all relevant participation waivers, and store those safely.
5. Deliver presentation, answering questions throughout.
6. After the presentation, move training outdoors for hands-on portion, providing demonstrations in photography and survey techniques (i.e., netting and transferring bees to vials). This is best done in the same sequence as volunteers will be instructed to follow when they return for independent surveys (see **Survey Protocols**).
7. At the end of the training (presentation and hands-on), return all the equipment to the materials box and make sure it is locked.

Finishing up the workshop(s)

It is at this point that a quick review of protocols and procedures is beneficial. This will help remind your participants of the basic procedures involved in independent surveys. If Wi-Fi is available, we recommend inviting participants to return to the presentation room to sign up for survey dates, and/or to practice using Bumble Bee Watch.

Post-Workshop

Follow-up via email (to those that provided one) thanking them for their attendance and reminding them to sign up for surveys/where to sign up.

Volunteer Sign Up

There are several options for how to have volunteers register for survey slots, and your choice will also likely depend on the software/social platforms you currently have access to. Depending on your staff capacity, you can choose to have one person manually manage volunteer signups (e.g., via email), or you can choose to use an online portal that will manage a predetermined schedule for you (e.g., a personal website equipped with appropriate software, or something like SignUpGenius.com).

If you are uncertain what method you'd like to use, we recommend starring with SignUpGenius, which is a scheduling platform with a free account option.

Program Updates

Facebook groups

For new programs, you can create your own Facebook group to let participants interact with each other more regularly, and to provide updates on surveys. For examples of annual program Facebook groups, visit the following:

https://www.facebook.com/groups/bumblebeecommunityscience

Blogs

Have program staff members and volunteer participants write blog posts to post on organizational and WPC social media channels. Blogs are great for attracting new participants, and for giving current participants a platform to share their experiences with the program.

For blog examples written by WPC staff, visit the following:

- https://xerces.org/blog/power-of-pinery-six-years-of-bumble-bee-community-science-at-ontarios-pinery-provincial-park
- https://wildlifepreservation.ca/blog/how-bumble-bee-watch-supports-conservation/
- https://wildlifepreservation.ca/blog/eight-years-of-community-science-at-the-pinery/

For a blog example written by volunteers, visit the following:

- https://wildlifepreservation.ca/blog/contributing-to-community-science-one-volunteers-experience-in-bumble-bee-conservation/

Email list

It is a good idea to keep track of how your participants are doing and keep them engaged by updating them on news about the program through an email list or newsletter. Using email, you can also re-communicate important dates or encourage survey sign-up. For WPC's programs, staff try to send out emails to update participants on progress, verification status, interesting finds at the site and more, approximately once a month throughout the summer/program duration. You can include a place for volunteers to grant permission to email them in your waiver form, or request emails separately during signup. This is a great way to keep those who are not avid social media users connected and engaged.

Organize Your Bumble Bee Watch Submissions

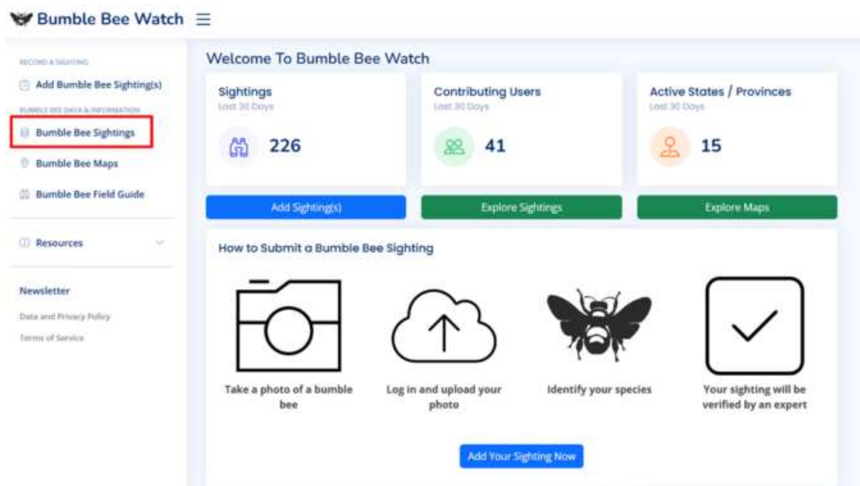
If your program is new, you must contact WPC to have a new project group set up for you on BumbleBeeWatch.org. It is under this project group that your volunteers will directly upload their bumble bee submissions. It is important that your volunteers upload submissions to your specific project so observations are easily found, and accurate program metrics are readily available; observations submitted outside of your project will be grouped with all other Bumble Bee Watch submissions.

Experts on Bumble Bee Watch, including WPC staff, will verify all your program submissions by the end of November. If you require observations to be verified earlier, please reach out to WPC at pollinators@wildlifepreservation.ca.

Check out this [Bumble Bee Watch submission tutorial] for additional help.

Some notes on the use of Bumble Bee Watch:

- Keep track of observations throughout the summer by accessing them through the “Bumble Bee Sightings” tab at the left panel of the website, noting any interesting or at-risk species and contacting WPC staff immediately with rare finds. Use the filtering options to help you locate useful information on the species found and how many have been verified.



- If you notice participants are not selecting your specific project on BumbleBeeWatch.org, send out a reminder email to volunteers. It is much easier for WPC staff to verify and organize the data for each program when participants select the appropriate project. At the end of the season, you can email a list to WPC of observations (or specific users) that were incorrectly uploaded and still need to be verified.

Staff and Volunteer Program Feedback

Program staff feedback

We would love for you to schedule a phone conversation in November-December with WPC staff in the first year of running your program to get feedback on overall program operation. Some potential topics of discussion are:

- What went well?
- Were there any problems, or things that could have been done better?
- Were the properties that were selected the best locations for the program(s)?
- Will you be continuing the program(s) for the following year?
    - If so, take time to reflect on any modifications that should be done for the following year, and determine a plan of action for the winter months that will enable you to deliver that updated program.
    - If not, is there anything we could do that would make it more feasible to run?
- Any suggestions for what we could do to improve program delivery?

Participant feedback

As with volunteer sign-up, there are a number of options for collecting feedback from volunteers, and your choice will again likely depend on the software/social platforms you currently have access to. Depending on your staff capacity and levels of volunteer engagement, you can collect individual responses to the program on-demand from participants (e.g. via email), or you can choose to use an online form constructor to collect and summarize feedback from a large group of community scientists (e.g., personal website equipped with appropriate software, Google Forms, SurveyMonkey, etc.).

The purpose of the participant feedback is to evaluate the program and make recommendations for future programs, so questions can be tailored to that purpose. An example participant feedback form can be found in **Program Documents** folder.

Volunteer Appreciation

It is important for volunteer retention and satisfaction that they feel recognized for their efforts and contribution to these programs. A component of your program should include volunteer appreciation, which can be done in a variety of ways depending on cost feasibility. You may also consider doing different things for volunteers that participated in surveys vs those that only attended the training workshop.

Some examples include:

- Volunteers can be mailed volunteer appreciation packages which can include things such as:
  - Completion certificates for individual volunteers. Certificates can highlight certain stats for that survey year (i.e. number of completed surveys, number of species observed, number of observations submitted to Bumble Bee Watch). See **Certificate of Appreciation** folder for examples.
  - A printed photo of a bumble bee (i.e. maybe a species that was a good find for that year, or simply a nice looking photo taken by a volunteer that year)
  - Letter/note that acknowledges the hard work of the volunteers and quick summary of program stats (i.e. Volunteers this year recorded X species, submitted a total of X observations which account for X% of all observations submitted for Ontario to Bumble Bee Watch for that year).
- Allowing volunteers to contribute to your organizational newsletter or write a blog about their experience in your program; or at least recognizing the efforts of your volunteers through these avenues (can include their own photos). This could also be a way to highlight or spotlight particularly active volunteers.
- An exclusive volunteer event or social of sorts can be planned. This can allow volunteers to interact and reflect on the season and celebrate their hard work.

- Food and beverages provided if possible.
- You could do a small raffle for a "door prize" of sorts, that is either funded internally or donated/sponsored.

- If your organization hosts any research related symposiums about research being conducted on the property, consider allowing some of your volunteers to join and participate in sharing their experiences and some results from the bumble bee community science program.

Final Report

Once the program is complete, WPC will expect your organization to provide a summary of how the project went. It is good for your records to complete reporting for all activities that you run, so this is likely a standard practice for you already. The components of this report can be modified individually for each program. Please discuss alternative options you/your organization would prefer with WPC staff. WPC will export the verified data from Bumble Bee Watch and provide it to the organization.

The reports WPC creates for their community science programs are detailed and include the sections outlined below (see **Final Reports** folder for examples). It is our hope that the majority of these sections will be completed by the "trained trainer" organization in the final report they submit to WPC. Your report should be emailed to pollinators@wildlifepreservation.ca by end March 1st, following the program year.

Example of report sections:

- Title page and table of contents: Title of the project, photos, list of sections included in the report.
- Introduction: Information on bumble bees, introduction to Bumble Bee Watch, motivations for initiating this specific project.
- Methodology:
  - Volunteer recruitment, training, and engagement
    - Methods for advertising the program, volunteer recruitment
      - What worked and what didn't?
    - Description of the training workshop setup
      - Timing, structure
    - Volunteer engagement
      - How volunteers were contacted and managed through the season
  - Bumble bee surveys
    - Methodology used for bumble bee surveys on-site
      - Who participated? How did participants sign up?
      - Site map and how site sets or routes were selected with a description of each site set/route
- Results:

    - Verified volunteer bumble bee submissions, exported by WPC, will be provided to organizations and these data should be formatted into summary tables and site maps
    - Highlight any observations of rare species
- Summary:
    - Highlight the main results of the program, what went well and what could be improved
- Volunteer feedback:
    - Summarize feedback collected from community scientists either through Google Forms or your own methodology
    - Focus on most common positive and negative feedback
    - Include specific quotes on volunteer experience
- Acknowledgements:
    - Include funding support, guidance by WPC, thank you to expert verifiers on Bumble Bee Watch, etc.

Bumble Bee Watch Funding

Bumble Bee Watch is a large-scale collaborative community science project that has been developed for monitoring and conserving North America's bumble bees. It was launched in 2014 after being founded in part by Wildlife Preservation Canada and The Xerces Society. In contrast to other community science platforms like iNaturalist or BugGuide, Bumble Bee Watch is specifically designed to allow for easier submission and verification of bumble bee photos, and the data that is reviewed by expert verifiers is of the highest quality community science data and is usable in research and conservation initiatives at large. With built-in features like the region- specific interactive identification key and interactive maps, there is a significant amount of both platform maintenance and continued development and improvement necessary to keep the project functioning at a high level. Unfortunately, this has costs!

Though not required for participating in WPC's "Train-the-Trainer" program, Bumble Bee Watch partners would appreciate if your organization's plans to apply for external funding for your bumble bee community science program include a request for funding to support the Bumble Bee Watch platform. All contributions, however small, are appreciated, and each makes a difference in our ability to continue to support the expansion of these important projects.