The general layout/questions for the interview will be:

Q: Introduce yourself: name, what you do and how you got interested in bees

Paul Longwell

An avid beekeeper and member of the Olympia Beekeepers Association, Paul enjoys teaching and sharing his love of bees. As a master beekeeper he has gained experience in both Langstroth and Top-Bar Hives. He is active in giving beekeeping presentations and has taught several classes for the Washington State Beekeeping Association, including the apprenticeship course to the inmates at Cedar Creek Prison. Paul also serves as one of the clubs' mentors to new beekeepers. He serves on the Thurston County Fairgrounds and Event Center board.

Penny Longwell

Penny's love of being outdoors and gardening started when she helped tend her mom's raspberry and pea patch as a kid. Gardening was a staple during her formative years. She is now an active member of the WSU Thurston County Master Gardeners and has fallen in love with pollinator gardens. So much so, that in 2013 she and her husband, Paul, designed, planted and continue to maintain a 40 ft. pollinator garden at the Thurston County Fairgrounds and Event Center. Penny is eager to share her knowledge of plants you can grow in your own gardens that will feed and nourish the pollinators and improve your garden yield. Penny and her beekeeper husband Paul provide a yearly presentation to the WSU Thurston County Master Gardener interns, emphasizing the joint interests between beekeepers and gardeners.

Q: How many kinds of bees are there?

There are over **20,000** known bee species in the world, and **4,000** of them are native to the United States. In the state of Washington, there are approximately **200** species of native pollinators, including bumblebees, leafcutter bees and mason bees.

Q: Why do we see lots of bees in the spring and summer, but not in the winter?

Bee season depends largely on temperature and the seasonal patterns of flowers. After hibernating over the winter, bees awaken in time to collect pollen and nectar from their preferred plants; flowering plants also bloom in correspondence with the arrival of their most effective pollinators. Certain bee species are active pollinators during certain seasons, as native flowering plants and bees have established a relationship throughout their lengthy evolution. Some bees have no seasonal preferences and feed off a variety of flowering plants.

Three of the most encountered bees by homeowners are honeybees, carpenter bees and bumble bees. These bees usually become active in the spring with the warm weather and flowering of plants. They remain active throughout the summer and into the fall. Cooling temperatures in the fall prompt them to prepare to overwinter. During the winter months their activity decreases to the point where they are not seen unless on a warm winter day.

Q: What does a day in the life of a bee look like?

The honeybee hive is one of the best-run, most efficient operations in existence. (Book recommendation: "The Honeybee Democracy"). It is no wonder the beehive has long been a representation for industry. There are three main types of bees: **queen, drone, and worker bee**. Every bee in the hive has a distinct role and a job to perform.

Worker Bees

Contrary to popular culture, the bees that gather pollen and make honey are female bees and are referred to as the worker bees. The life of a worker bee goes like this:

Day 1: Egg Stage — The queen lays an egg into the honeycomb.

Days 1-6: Larva Stage — Worker bees known as "nurser" bees will feed the new larva a diet of royal jelly, pollen, and honey.

Days 7-21: Pupa stage — new cute fuzzy little bees will emerge from their comb on the 21st day.

The new little bee will begin their first job right after emerging from their cell their first task will be cleaning the cell they just emerged from. They will generally spend 1-2 days doing this. Bees are very clean by nature and the Queen will not lay additional eggs in the cell until this is done.

Hive Roles

Bees will then move into their role as a nurser bee. Just like the nurser bee who fed them, they will begin to excrete the needed royal jelly to feed to new larva. After 5 days of this role and mastering the art, bees will move on to feeding royal jelly to new drone and queen cells until day 11.

At this point bees can help build honeycomb with wax excretion. The honeycomb is a wonder all within itself if you look at the uniformity in the cells and pattern. Bees will spend around 6 days performing this role and during this time will build comb, and repair comb.

Bees will then spend their remaining life working in jobs that fall under the following categories:

Cleaning & Maintenance — Removing dead bees from the hive on cleansing flights. Bees are exceptionally clean. After a long cold spell, if you look carefully in front of your hive, you will notice dead bees. That is because as soon as it's warm enough, bees will take all the bees that have died in the hive outside the hive. Worker bees will use propolis as a seal in caulking the hive. There is also a job for guarding the hive from intruders, as well as helping to cool the hive as temperatures rise. Other bees bring water to the hive.

Feeding — Drone bees or being selected to be an attendant for the Queen Bee. While attending to the Queen they will groom her and take her excretions out of the hive, allowing the Queen to focus solely on her tasks of laying eggs.

Honey Production — Jobs in this area will consist with honey sealing, and pollen packing.

Foraging Bees — The last job that a worker will have, and that they will do until the end of their life, is to forage. They will spend their days looking for nectar, pollen, and propolis. They will work themselves to death.

Drone Bees

The drone bee is the only male in the hive, their only role is to procreate with the queen, and once they have mated with the queen they will die. Worker bees can lay drone eggs since the drone egg is an unfertilized egg. Drone eggs look quite different from regular worker bees. Their cells are small and round vs. being in the honeycomb-shape. Drones are distinctive in their appearance; they are larger with big eyes and are unable to sting. They will spend their days waiting to mate with a queen and hanging out with other drones. In colder climates drones will be the first indication that winter is in the air, since right before winter the female worker bees will kill off the drones and will push them out of the hive. The hive will not need a queen mated in winter months and cannot afford to have drones consuming honey.

Queen Bee

Let there be no mistake, there can only be one queen in the hive, and if there are more queens present, the queens will fight it out until the death — leaving only one survivor. Most people never get the chance to hear the songs of a queen, but if you ever get the chance to hear multiple queens in one area, they will chirp and sing. Hives create reserve queen cells that resemble a peanut in preparation for the chance the queen dies. Hives also produce multiple queen cells if they are getting ready to swarm or they are queenless.

Without a good queen, your hive may suffer. There is a lot of pressure on your queen not to lay spotty brood and to be strong. Your queen will set the mood for your hive. She has the

longest life expectancy of 2-5 years. She will mate with multiple drones during her mating flight but may never have the need to mate again. The queen appears different from her workers. She will usually be longer. Don't worry if you aren't able to see her when you first start beekeeping, as her attendants will do their absolute best to prevent you from finding her.

A healthy and happy hive is truly a thing of wonderment and beauty. The hive's ability to self-maintain and produce is amazing to see. To see how a hive cleans and cares for itself is awe inspiring. To watch little fuzzy worker bees emerge from their cells and assume their new roles is fascinating. Being able to observe the cleansing flights and foraging is miraculous. And it is truly astonishing that these little insects know from birth instinctively what their role is in the hive.

Q: Why are bees an important part of our ecosystems?

- There is no doubting the importance of bees to our food supply. Without them, our gardens would be bare, and our plates empty of favorite fruits and vegetables. Even that juicy hamburger on your plate is dependent upon the alfalfa leafcutter bee, which is a very efficient pollinator of alfalfa, carrots, and other vegetables. Without alfalfa, there is no food for the beef, which means no beef patty on your burger. It is all interwoven into the circle of life.

- But we should also remember the other reasons bees are important to the environment. As pollinators, honeybees and native bees play a part in every aspect of the ecosystem. They support the growth of trees, flowers, and other plants, which serve as food and shelter for creatures large and small. Bees contribute to complex, interconnected ecosystems that allow a diverse number of different species to co-exist. Pollination of native plants produces fruit and seeds, a major part of the diet of approximately 25% of bird species, as well as many mammals.

Q: Do we need to be worried about the Asian Giant Hornet?

WA Dept. of Agriculture is working to identify and irradicate the Asian Giant Hornet. In 2020, both Washington and Canada have had new confirmed sightings of Asian giant hornet and in October of 2020, WSDA conducted the first-ever eradication of an Asian giant hornet nest in the United States.

Asian giant hornet attacks and destroys honey bee hives. A few hornets can destroy a hive in a matter of hours. The hornets enter a "slaughter phase" where they kill bees by decapitating them. They then defend the hive as their own, taking the brood to feed their

own young. They also attack other insects but are not known to destroy entire populations of those insects.

Ways to report a sighting:

- Online: **agr.wa.gov/hornets**
- Email**:** **pestprogram@agr.wa.gov**
- Call: **1-800-443-6684**

- **Q: If I wanted to plant a garden that was a happy place for bees, what would I plant?**

  Keep in mind that many double-flowered forms aren't accessible to many pollinators. They appreciate blooms that are from open-pollinated, non-hybrid plants. The plants attract pollinator that have the correct tongue length to access the sweet nectar. Hybridized plants are bred for color, disease resistance and often lose their scent and other attractants to guide the pollinator. Very little pollen or nectar is available to them.
- **Bees** – Attracted to **white, yellow, or blue** flowers that are open, shallow, or tubular. Examples: Asters, Clover, Dandelions, Marigolds, Poppies, Sunflowers, Zinnias.
- **Hummingbirds** love long tubular flowers that are **red**, but are frequently seen visiting flowers that are **orange, yellow, purple, or even blue**, giving you plenty to choose from. Examples: Bee Balm, Columbine, Daylily, Lupine, Foxglove, Hardy Fuchsias, Weigela.
- **Butterflies** love **red, yellow, orange, pink and purple** blossoms that are flat-topped or clustered and have short flower tubes. Examples: Alyssum, Aster, Bee balm, Calendula, Cosmos, Daylily.
- **Plant similar colors together in groups so they are easy to find.** Blossoms give off a bit of heat, as well as UV color patterns that act like a runway for the pollinator to find what it is seeking, which is pollen for protein and nectar for carbohydrates. Check out the photographer on Instagram: Craig P Burrows (cpburrowsphoto) for beautiful shots of plant blossoms under UV light, which is how our pollinators spot and find the blossoms they need for nourishment.
- **Plant for early spring through fall** so our bees and other pollinators can collect and store enough food to keep them alive until it's time to hibernate during the winter months.
- **I have a list of plants you can add to your home gardens right now,** divided into each season. I also have a list of local plant nurseries who offer "pollinator-safe" plants, which means they are not treated with harmful chemicals that can be taken back to the hive and cause disease and other issues for the bees.

- **Questions about plants?** You can contact the WSU Thurston County Master Gardeners answer clinic. During the pandemic, our volunteers are available via email at master@co.thurston.wa.us. Want to learn more about becoming a Master Gardener? Check out this website for more info:(https://extension.wsu.edu/thurston/gardening/
- **Also check out our Master Gardener Foundation Thurston County (**https://www.mgftc.org/) Joining the Foundation is a great way to connect with gardeners and lovers of all things regarding plants, gardens, and composting. No experience required ☺

Q: Do you have a favorite fun fact about bees? Fun fact: beauty pageants get their hierarchy of a Queen and her Attendants from the honeybee hierarchy.

Q: Do you have a favorite memory of bees? McMinnville

Resources:

1. Pollinator Garden at Thurston County Fairgrounds and Event Center (http://www.facebook.com/pollinatorgardentc)
2. **WSU's Publications Site http://gardening.wsu.edu**
   - **FS122E** Neonicotinoids Pesticides and Honeybees
   - **PNW591** How to Reduce Bee Poisoning from Pesticides
3. Video from WSU: Pollination and Protecting Pollinators (https://vimeo.com/146957716)
4. Xerces.com has many downloadable files regarding pollinators in our PNW region.

Books:

"The Honeybee Democracy," Thomas D. Seeley

"100 Plants to Feed the Bees," The Xerces Society

"Attracting Native Pollinators" The Xerces Society

"Mason Bee Revolution," Dave Hunter & Jill Lightner