California State Parks

Video Transcript

Glory Days: Springtime at Henry W. Coe State Park

Good morning. I'm Barry Breckling, California State Park ranger here at Henry Coe State Park and this is my wife, Judy. Judy is one of the volunteers here, and she leads a lot of the wildflower hikes.

Without pollination we wouldn't have any of these plants that we see here. Pollination is the process that makes seeds fertile, so a new generation of plants can grow and the plants provide food for insects and even for human beings.

Insects have a real particular relationship, a very close relationship, with flowers. The flowers provide nectar and pollen for the insects; they provide food for the insects. And the insects will pollinate the flowers. So there's a very close relationship between insects and flowers.

There are, of course, other ways that flowers are pollinated, besides just insects. One of the most important ways is wind. All of our oak trees here, and the pine trees, they all are pollinated by wind. And since they don't have insects coming to pollinate them, they don't have to have big fancy flowers, because the flowers are what are saying "Come here, I've got something for you." Besides wind, there are also other ways plants are pollinated. They're pollinated by birds; for example, hummingbirds. We all know hummingbirds drink the nectar from wildflowers, and they also pollinate those flowers. In some places, not here in California, but in some places, mammals, such as bats, will pollinate flowers and even in some places larger mammals like lemurs.

Let's take you back to probably your fifth grade biology class, where you learned all about the different parts of flowers, and talk about some of the different parts of the flower. We have the first layer on the outside of the flower, the sepals, and these enclose the rest of the flower, the petals and everything else, and protect it when they're in the bud. Once the sepals open up, you have what's called the petals, and again those are the things that attract the insects. They say, "Here I am. Come get a free meal." Then the next layer inside are the male parts of the flower, the stamen. And the stamen are comprised of a filament and an anther. The anther is where all the pollen is. For simplicity, we're just going to call that whole thing the stamen, the whole male part of the flower is the stamen. And then the most central part of the flower is the pistil. The pistil is made up of the ovary, which, once it's pollinated, will become the seeds, the style, and at the very top the stigma. And the stigma is where the pollen needs to get to, to go down into the ovary. So we're just going to call this whole thing the pistil. So we have the stamen, the male part, and the pistil, the female part. This is just a basic design, but we'll be showing you some plants with a little different design. But they all have the same thing, the stamen and the pistil. And our wildflowers all have nice brightly colored petals.

I want to talk about one more thing, before we head out on the trail, and that's cross-pollination. Plants want to cross-pollinate. If plants self-pollinate, then they just have the same genes, the same exact genes. If something comes along like a major climate change or a disease that kills one of the plants, it will kill them all. But when plants cross-pollinate, when pollen goes from one plant to another plant, then there's a mixing of the genes. And with the mixing of the genes comes a little bit of variety, just like us human beings, we're all just a little bit different. And with one species of plant that's a little bit different, if a major climatic change occurs or if there's a disease that comes along that kills some of them, there will always be some that are able to survive, because they have little bit different genes. So we'll show you that plants go to some real special means in order to make sure they cross-pollinate. So why don't we go ahead and head out on the trail, and we'll take a look at some of these beautiful wildflowers we have here at Henry Coe State Park.

Here we have an interesting plant, scarlet pimpernel, and I'd like to tell you a little bit about it. You can't really see much in the way of flowers right now, because they're all closed. But once the sun has been out a little bit longer here, these flowers will open up, and, along with the poppies and many other flowers, these flowers actually close up when it's dark. One of the times it's dark is when it's overcast. And when it's overcast, a lot of times it will rain, and so that's what it's closing up for, to protect all those internal parts from being damaged by rain, and having all that pollen washed away. If the flower's wide open, the chances would be good that the pollen would be wiped away and they'd have to produce more. So again this is scarlet pimpernel. The flowers are a real pretty, not really exactly a scarlet. In fact we can see one of the little flowers here that is kind of open. It fell off. There's one of the little flowers there, and they're quite beautiful, but they're really kind of a salmon; they're not really scarlet. And they're called scarlet pimpernel, they're named after the person, you may have heard of before, and Judy can tell you a little bit about the scarlet pimpernel.

JUDY: Well, actually, it's a novel many of us had to read in school—*The Scarlet Pimpernel*—and the character in the novel was named after the flower instead of vice versa. The Scarlet Pimpernel character would pop up out of nowhere in the nick of time to rescue French from the guillotine, and he was named after the flower because when the sun comes out and the conditions are right, the flower pops up out of nowhere. It is a weed. It's a European weed, but, unlike a lot of weeds that we really don't like very much, most of us kind of like the scarlet pimpernel. It's also a love letter flower. It's a very serious love letter flower—in Europe in more distant times there were various degrees of love letter flowers, and the scarlet pimpernel was one of the top level. If you put a scarlet pimpernel in a letter and sent it to somebody, it pretty much meant that your intentions were serious.

BARRY: Well, good, let's walk down the trail a little bit and see what else we can find, and maybe when we come back (it's sunny now today), they'll open up again. That will be fun to see the scarlet pimpernel all wide open, or maybe we'll see them further down the trail. So let's head on down the trail. There's actually shelter down here. A lot of stuff ought to open up I think.

This is seep-spring monkeyflower, and, like all of the monkeyflowers, they have a real interesting stigma. We talked about the stigma being the part of the pistil, the part of the female flower that accepts the pollen. So when a bee flies in here to get some nectar deep down inside, it kind of rubs its belly on the stigma and, in order for the plant not to be self-

pollinated, the stigma accepts the pollen and then it closes up. It just has two sides and it actually kind of goes like this; the stigma just closes up after it grabs the pollen off of the belly of the bee. And then the bee, on its way out, picks up more pollen from this plant and it can fly to another one and leave it in the same way. This one's pretty wet. We had quite a bit of rain here in the last couple days, but if you find one of these that's in better condition, you can actually sneak up on it, touch the stigma, and you can see it move. It's amazing; you never thought that plants could move that quickly. But these actually close—the stigma closes—rather quickly. So this is seep-spring monkeyflower.

This is California buttercup, a real common wildflower in the park here, and actually it blooms very early. We usually see them in March, sometimes in February, and they'll still be blooming in May. And they're interesting. Many flowers are like this, just a very open flower, just kind of basic design of a flower. When you have flowers like that, that aren't real fancy or anything, they have many pollinators, so a lot of different types of insects pollinate this plant. Of course that has some advantages. That means they get a lot of pollinators coming to their flowers. They're easy to pollinate. Other plants, in fact the next one we'll see down the trail here, actually only allow certain insects to pollinate it. And we'll tell you about that and the advantages that has. So an interesting thing about buttercups is the fact that they're self-sterile, that a buttercup cannot pollinate itself. They always pollinate other plants and so we get that mixing of genes; we get that cross-pollination happening. And I believe this yellow color is really attractive to all different types of insects. The little bee flies, and butterflies, native bees—all sorts of different insects come to pollinate these beautiful little plants.

So, yeah, why don't we head down the trail here? I see some native peas down here, hillside pea, and we'll take a look at that. This is hillside pea, and it's an interesting plant. It doesn't really have much strength or structure itself. It actually uses these little tendrils here to grab around other plants and climb up. So an advantage of climbing up higher is that it shows its flowers off better to the insects and also it gets its leaves up there where they can get the sun. These are interesting little flowers. They are pollinated mostly by bumblebees. The European honeybee can't pollinate them—they don't have enough weight to pollinate them. What happens is, if I can show you, is the bumblebee comes along and it sees the white here, which is, to the bee's vision, probably not actually white but is probably ultraviolet. And I'll tell you a little bit more about that in a minute. But the bumblebee comes in and grabs hold of the outside thing, it's called the wings, and grabs hold of it with its legs, and let's see if we can make this do it. When it does that, those anthers and pistil pop right up, the stamen and the pistil pop right up, and the bee picks up some pollen or else it leaves some pollen on the stigma. Then it climbs down inside—and you see those little lines, all the little lines that are pointing to the middle where all the good nectar is? Those are called nectar guides, those lines on the flower. So that's how the bee does it, hangs on it, opens it up, gets the pollen on its belly, and then crawls right down in the center to get the nectar.

There's also another plant here, that maybe I can pull this one over here so you can see it. This is called bedstraw. It was used by people in making mattresses. Because it has little hooks on it, I think it's probably where Velcro came from; you can see how that kind of jumps. So I think this is where Velcro came from; somebody saw this plant and decided they could make things that hook together. But the leaves and the stems are real sticky, and that helps this plant grow up, just like the pea, grow up on the top of other plants because it has these one-way hooks that only face backwards, so it can only go up higher and higher. Bedstraw

has tiny little flowers; way down here you can see little flowers. But there are insects that actually pollinate those tiny little flowers.

Going back again to the hillside pea, I want to tell you a little bit about colors. Now people see from red all the way up to violet, but bees can't see red, so you will never see a bee on a red flower unless it's by accident. Bees see from yellow all the way up to violet and even ultraviolet, which we can't see. So we can't see ultraviolet; to us ultraviolet is usually just a white color or light color. And that's what these flowers undoubtedly are—a very light white color which is ultraviolet and really shows up to bees. And then the little nectar guides they'll see very plainly in there, too, being a different color. So let's move on down the trail a little bit and see what else we can find. Let's walk down just a little ways.

Here we have wild hyacinth. It's in the lily family, a beautiful plant, and there's a number of related species that have beautiful flowers. So we see these all spring, all the different types of brodiaeas and such, and it's a lily. It's fairly closely related to onions, and one of the prettier flowers in the park, wild hyacinth.

Here we have an Italian thistle. There are a number of thistles that are not native to the park that we consider invasive species. They're mean, nasty, and terribly stickery, and they're from Europe mostly. So this is Italian thistle. They get quite a bit taller, and we're actually in the process of trying to do some removal of things such as the Italian thistle and star thistle especially. It's an especially bad plant here in the park. We also have bull thistle and a few others. We have our own native thistle that's quite beautiful and doesn't grow in such great quantities and in such weedy locations. This Italian thistle has a pretty little flower, but it's one of the plants that we want to get rid of.

This is called Gambelweed. The name Gambel comes from the fellow that named a number of things in the West, and Gambel's quail is one, and Gambel's oak. Gambelweed is in a group of plants called sanicles, and sanicles are interesting plants. Most of the ones around here have yellow flowers. We have one that has purple flowers though. And sanicles are also called snakeroots because very often these plants have curly roots that look like a coiled snake. It was thought that because they have this root that looked like a snake if you got bitten by a snake, if you ate some of the sanicle root, you wouldn't die from the snake bite. It worked pretty well because, in actuality, the rattlesnakes around here, if you're bitten by them, chances of dying are very slim. Almost anything would work in that case. These have little tiny yellow flowers, and again these are kind of open tiny little flowers, and they attract all different types of insects.

This plant is in the carrot family, and the carrot family is interesting from the standpoint that it has many edible plants. There are carrots, of course, and celery, lots of plants are edible. But the carrot family also has some of the most poisonous plants, and that includes water hemlock and poisonous hemlock, so it's a good idea not to eat these plants. We actually have a sanicle here, two sanicles actually, turkey pea and the other one is poison sanicle, that smell exactly like cilantro. In fact, I'm guessing that poison sanicle really isn't poisonous. It's just the strong cilantro smell that people smell and have thought it's poisonous, but I'm not going to try it. So let's see what we can find farther down the trail here.

This is blue witch. It's also called purple nightshade. It's a plant that's in the tomato family, tomato and potato family. You see the beautiful flowers, and you can see how those little green dots in the center act probably as some sort of guide to get the insects to go right to the very center. These are also pollinated by bumblebees, but a bumblebee will handle this in a whole different way than it does the hillside pea. It'll hang from those anthers and it will vibrate and the pollen will fall on its belly and then it goes on to another flower where the pollen will be rubbed off by the pistil. A beautiful flower. These are wonderful, and again I mention that these are members of the tomato family, and if you look back over here you can see the little fruits. Now these will get dark, and nightshades are very poisonous, people die on occasion from eating nightshades. In general, the nightshades, if they're cooked, it will remove the poison, but it's not a very good plant to fool around with, because it is quite poisonous. If you look again, it looks a little bit like a tomato fruit. An interesting thing, in England many years ago they actually thought that tomatoes were poisonous, just because nightshades are poisonous, tomatoes are poisonous, but people actually died from eating tomatoes. The reason was they had pewter plates and they put the tomatoes on their plates and the acid of the tomatoes would actually leach out the lead and people would be eating lead, and they'd die of lead poisoning from eating tomatoes. So here's another family with tomatoes, potatoes, that has a lot of edible plants, but this family also includes the nightshades and other plants that can be poisonous also. A real beautiful plant.

Yeah, this plant is called *Monolopia*. What a terrible name. That's the genus name, the scientific name, and it doesn't have another common name but *Monolopia.* Anyway, I guess that's kind of pretty. You can see a little fly on the flower there, and that fly will pick up pollen from all the tiny little disc flowers in the center there, and it'll fly off to another plant, and it'll leave the pollen on the stigmas and the pistils of the other flowers. So you can see actually a little fly that's probably getting some of the pollen. Remember the insects eat both the nectar and the pollen. So I would guess this guy's going after eating some of the pollen. But of course some of it rubs on his body, and then he'll fly off to some other plant.

At first glance you might think this is a buttercup, but actually it's a very different plant. Buttercups are considered rather ancient, and these are members of the sunflower family, which are considered more modern species. And actually these aren't petals; these are actually individual flowers themselves. Right around the outside edge are little flowers that have these big strap-shaped petal-like flowers. And then inside here are hundreds of little flowers. It's just like a sunflower that they get sunflower seeds from. You have the big ray flowers on the outside that attract insects and then all these little disc flowers in the middle.

Over here we've got a lupine, and there are a lot of different types of lupine in the park. I believe this one is the broadleaf lupine, and it has pretty blue and violet flowers. It's another one that has that shape that bees, and not the European honeybee, but the bumblebees and other native bees, probably bumblebees for this one pollinate it. Again it hangs from the wings; the little side petals and inside the pistils and the anthers do their job. The way you identify lupines is they have these palmately divided leaves. See how the leaves are like a palm of a hand, they're spread out, little leaflets coming out. That's one whole leaf, and those are all the little leaflets coming out, and so that palmate means it's probably going to be a lupine if it has these little pea kind of flowers. And again this is in the pea family.

Lupine is the common name of these plants, and also it's the scientific name. It's the genus *Lupinus*. *Lupinus*, or lupine, means wolf. It was thought that these plants robbed the soil of nutrients, but in fact the members of the pea family actually add nutrition back into the soil. So they're not really robbing or stealing like you might think of a wolf stealing people away. So they're kind of sparse right in here, but we have some nice little miniature lupines. Then, if you follow over this way to the right, quite a distance over here, we have another lupine called whitewhorl lupine and you can see the white colors on the flowers. I don't recall how many lupines we have, but probably about eight different species of lupines. They're one of the prettiest of our flowers. We've got some areas here where those miniature lupines and some other lupines actually cover whole hillsides farther out in the park.

Here's a very interesting plant, that I'll tell you about. Everybody should know about this one. It's called poison oak. "Leaves of three, let it be." You can see that each leaf consists of three leaflets—three parts—and if it has three leaves, probably better just to not fool with it because poison oak can give you a pretty bad rash. It actually has pretty little star-shaped flowers, and those flowers eventually develop into little berries, and those berries provide food for a lot of animals, for birds and small mammals in the winter when there's not much of anything else. So although maybe we don't like poison oak too much, it really is an important plant. Probably the most numerous, probably the most common shrub, in all of California.

There are a lot of flowers in the park we call belly flowers, because you really have to get down on your belly to see them. There are some little flowers I'm seeing down here, little yellow flowers. But the one that's of most interest is this little Johnny jump-up. It's actually a wild pansy or wild violet. You can kind of see how they look like pansies or violets. And you can see that way back inside is where the nectar is. You can see those nectar guides again. So a bee comes in, it can land on the bottom petal here and then walk right on in. This plant needs something like a bumblebee or maybe some of the animals with the long proboscises like the butterflies, in order to pollinate it. But they can follow those little lines right into the center. An interesting thing about these plants is that they follow the sun. These plants are facing right up towards the sun, and during the day they'll face to the east in the morning, and then as the day progresses they'll actually turn until they're facing the sun in the west. You can walk out one of these trails in the morning and see hardly any of these guys; you can then turn around and come back, and they're all facing you. The advantage that gives a flower is that it's all lit up for the insects—it's going to be facing the sun, it's going to be nice and bright, and the insects are going to easily be able to see it.

Here we have one of the prettiest flowers, I think, in the park. It's called shooting star. We have two varieties, one that's in the open areas, and they're pretty much all gone, and this one that's in the forested areas. This is called the woodland shooting star. And if you know the plant *Cyclamen*, that garden plant, you can see the similarity. In fact, it's in the primrose family. Both of them are in the primrose family, so it's a little primrose. Beautiful little flowers, they're turned inside out. Actually, you can see all the parts are down here and we talked about how plants open and close to protect the flower parts. Well, they also have other ways of protecting the flower parts. Like those peas, all the flower parts are hidden inside where they're all safe. And with this one, the flowers point down, so that if it rains, the pollen won't be washed away as much and the male and female parts will be protected. An insect has to be a special one to pollinate this. It's like those peas, only certain insects can pollinate the peas, and only certain insects are able to pollinate these. Usually it's bumblebees again on these

flowers. They hang from the anthers and they vibrate, and all the pollen falls out on their belly. They fly off to another plant, and then they rub their belly against the stigma, against the pistil part of the flower, and pollinate it.

Well, thanks for coming along on the wildflower hike here. One plant we mentioned just a little bit about, and that's the California poppy. I think they're one of the most beautiful plants we have here in the park, one of the most beautiful wildflowers, and we kind of take them for granted. But they're just a really special flower, one of the most beautiful ones around. Here in the park we have something over 700 different types of plants, and most of those have flowers, and over the months the flowers change. You can find a flower here any month of the year, but during the springtime it's very special—March, April, and May. All the spring wildflowers come out and put on quite a show.

I think what's important to remember is although we really enjoy these wildflowers, they're quite beautiful, they have some more important jobs than just pleasing us. These wildflowers provide food for insects, and if we didn't have insects and we didn't have the wildflowers and if we didn't have pollination going on, what we'd have is no plants, no flowers. We wouldn't have any food for even us humans; even the grass provides food for the cow that makes the steak that we eat. So I'd just like to say thanks for coming along on the hike, and get out to the parks and really enjoy the beautiful wildflowers we have in our California State Parks. Thanks for coming along.

Running Time: 29:00