Pruning

Slide 1

This is an introduction to pruning trees and shrubs for Master Gardener online training and my name is Tim Kohlhauff. Before we get started, I just want to really emphasize here that that this is an introduction. There is no way we could cover everything, all the different topics associated with pruning and so this is a kind of a general way of getting started on it and preparing you to answer the questions that our clients, homeowners, and landscapers will be asking about pruning.

Slide 2

All right, well what is pruning? It’s always good to start by defining our objective. Pruning is the intentional and permanent wounding of a plant to meet management objectives. I’ve underlined wounding because it’s important for all of us to understand that what we are doing is creating a wound that requires that the plant spend some of its resources to heal, or actually to seal, and this is a good place to tell you that plants don’t heal, if you didn’t already know that, they seal off wounds to prevent decay. So if we think of pruning kind of like surgery - surgery is sometimes necessary and certainly life saving, but is always carries an element of risk. Pruning is the same for a woody tree or shrub.

Slide 3

Well what are some of the reasons that we decide to prune trees and shrubs? Here’s a list of a few that might be good reasons that we might prune. First, to promote good structure, and this refers more to trees than to shrubs. If you think of a tree as essentially a house that builds itself or grows itself; we want a tree to grow in the right directions, we want to build good healthy connections between the branch and the trunk, so by pruning when a tree is younger we can actually avoid, I’d say head off but we can never head off trees, so we can actually avoid problems that might come much later in the tree’s life. So we prune to promote that good structure. We also might prune to mitigate a hazard or a defect. Say a branch is hanging out in the street where cars might hit it, or perhaps branches are rubbing against the house or some other structure. Maybe a branch is partly broken or has some decay in it that might make it fail, so in that case we might prune to get rid of these hazards.

We also prune to manage disease or decline of a tree or a shrub. Some diseases are best controlled, some of them are only controlled, by pruning out infected tissue. An example of this might be fire blight on a rose bush. Fire blight is a bacterial disease and once it’s in the plant there isn’t a way of treating it. We need to prune out the affected area in order to save the rose. Trees go through a natural process of decline in old age, and we are talking about in some cases hundreds of years. This decline sometimes needs to be managed if the tree is in an area where it might pose a hazard to people, structures, or traffic nearby. So sometimes we prune to actually reduce the size of a tree to manage its decline. We won’t talk about it in this presentation, I’m going to address pruning for structure and pruning ornamental trees, but a lot of pruning that goes on is for agricultural production. Orchardists prune regularly to promote good
crops of apples, peaches, apricots, cherries, all sorts of tree fruits, so that would be another good reason to prune. And last, to improve the aesthetics of the plant. We just want a healthier looking or a better looking plant, so we might prune to get rid of some of the old tissue and just kind of make it look a little better.

**Slide 4**

Hi, my name is Tim Kohlhauff and I’m going to talk to you about pruning trees today. This is a green ash and this poor little tree has suffered, it hasn’t got quite enough water. So you can see the canopy is not very full and there is some deadwood in here. When we think about pruning a tree or a shrub and come to a tree like this, you really don’t need to prune too much, and in fact don’t want to because it’s already under a certain amount of stress. In a situation like this, all we really want to do is eliminate the deadwood and help the tree grow by taking out that deadwood and keeping it from decomposing or from rotting. Now the deadwood that we see in this tree is right up here. Unfortunately our main leader has died, which is too bad, but we’re training a new one right next to it, so we want to take this out. And it’s hard to reach this, this is where we might be tempted to use this tool. This is called a pole clip and you may have seen arborists use this, you may have seen this in a Home Depot or something like this, and I want to tell you right now - don’t use this. This is a tool you can use to reach hard-to-reach places, but it doesn’t make a very good cut, and by that I mean it doesn’t get close enough to make a true natural target pruning cut. When you use this, and I’ll show you right here, the way this clip is designed, we can’t get close enough to make this cut right where we need to, which is right here where there’s a little swelling at the base of the branch. You can see this pole clip doesn’t come close enough to do that, and if I were to cut right now I would leave a little stub; right here is as close as it can cut. We don’t want that. Now on a little branch like this it’s probably not as big of a deal, but on bigger branches you are leaving a bigger stub that can’t seal over, it’s slowing the tree’s process of sealing off the open wound and then it leaves it open for decay. So I’m going to put this tool right away, there might be situations where it may be the only thing you can use, but for most cuts you want to avoid it.

So instead I am going to use a tool that is ideally suited for this job, just a regular old pruning saw, this one has a curved blade, you can get a straight blade, either one is just what you need for most pruning cuts. If the cut is going to be small, use a nice sharp pair of clippers. And as you can see this is pretty well worn, but I keep them sharp. What you want in clippers is what they call bypass. That means we’ve got this cutting blade right here and we’ve got this right here and the cutting blade bypasses, it doesn’t stop here. There is another type of pruner called anvil pruners and in that one the cutting blade stops at the anvil, and in fact it kind of comes right like this and instead of cutting it does a lot of crushing of the plant tissue, and you don’t want that, you want a nice clean cut. So bypass pruners and a nice sharp pruning saw are all you need to make your cut. So I’m just going to make this cut… right up here. This is kind of a tricky area to saw in, so we are going to make the best that we can. If I had a little thinner saw that would be great, but we are just going to cut as close as we can and hopefully not make too many wounds in the other branches.
Sometimes the saw slips like it just did and you will scratch some of the nearby branches, you want to try and keep that to a minimum, but a little scratch here and there is not going to seriously damage the tree unless it has some other problems. So we are just going to cut this as close as we can to that swelling at the base of the branch but not cut into it at all. If you cut into that swelling, you are taking away the tissue that can seal off the wound. So here we have our dead branch and although you can’t see it from here I have cut as close as I can to leave a nice clean cut here, and the branch collar tissue can hopefully seal this off and we’ll have a new leader growing and hopefully making this a nice healthy tree. And that’s pruning.

**Slide 5**

Well, let’s start with the basics of a proper pruning cut, and really, before we turn you loose out there with a chainsaw or clippers or even a pruning saw, you should probably do some preliminary reading before we get started. We’ll start with *A New Tree Biology* by Alex Shigo and this is really an important work, this is kind of a seminal work in understanding how trees grow. It’s 618 pages but I think you'll enjoy it. Of course if we don’t prune the right way, *Fungal Strains of Wood Decay in Trees*, that’s an important area of pruning to understand, lots of pictures in this one, although fairly technical. Only a couple of hundred pages. *Taschenbuch der Holzfaule im Baum* by Karl-Heinz Weber, now this one is in German so you are going to have to do some translating at home, it’s really important though that you read this one. His addition to our understanding of woody plants is really important. And of course *The Body Language of Trees*, you have probably heard of it; this is a book about tree biomechanics or why and how trees grow the way that they do. It was written by Claus Mattheck. Fortunately it was translated from German because it’s almost 700 pages. Well, if you haven’t guessed by now, I’m joking. You don’t have to read all of these books before you go out and prune, although it’s not a bad idea. But no, I think we’ll cut down on this just a little bit. I don’t want to discourage you from reading these, but I do have some other books, slightly shorter and a little less technical that I’ll list at the end of the presentation that might help you improve as a pruner.

**Slide 6**

Well, let’s get started with the basics of a proper cut. This is often called natural target pruning, and the reason for that is there is, on trees and shrubs, a natural target, that when you prune there, you actually increase the ability of the tree or the shrub to seal off that wound. It will seal it off as quickly as it can, and as effectively or efficiently as it can by making those cuts at the natural target. So it wouldn’t be Master Gardener training if we didn’t introduce some new vocabulary terms I think. So let me start with the branch bark ridge. The picture on the screen that is down towards the bottom, and you can see it is a black line there right on the trunk. The branch bark ridge is formed by the growth of the tree trunk and the branch, and as they grow in girth the bark comes up against each other, kind of plates of bark in a way that come up against each other and actually form this ridge. This is a good sign, a healthy sign, that means that the trunk and the branch are both growing. There is an opposite to this, you might call it a branch bark valley. The correct term is “included bark” and I’ll show you some pictures of that later in the presentation. That branch bark valley or included bark is actually a
bad sign, it is a sign that something has gone wrong. So why is the branch bark ridge important? The reason is that it kind of gives us a starting place for where we are going to make our cut. It helps us identify the natural target.

The other part of tree anatomy that helps us identify our natural target is the branch collar and that is labeled on the picture up near the top. And by the way I’d like to say that I think this birch tree grew just so I’d have a great picture to show you. This is a really good example of these two parts of tree anatomy. So the branch collar is at the base of the branch, right where it joins the trunk of the tree. You can sometimes see branch collars between one branch where it joins a larger branch as well. All branches have these collars, and this is a swelling at the base of the branch as I said. It comes from the growth not only of the branch, but also from the growth of the trunk, and so every year they are both laying down new layers of growth that actually interlock. This is the way that the branch is attached to the tree, and this is a great way of branch attachment, it helps it resist the weight of the leaves in the summer or of snow in the winter, it helps resist breaking in a windstorm because it’s got these interlocking plates or rings of growth with the trunk, and that’s what forms the branch collar. What’s important for us is that the branch collar is also where the callus tissue is, and the callus tissue is what is going to seal off that wound in the tree. And if you haven’t heard it before, I’ll just remind you that trees and shrubs don’t heal, they seal. Meaning they don’t grow new tissue right where that pruning wound is made, they just seal it off to prevent decay from getting into the trunk or into the branch.

So we want to make our natural target pruning cut right outside the branch collar. If we make it inside the branch collar we are actually removing the tissue that can seal off the wound. If we make it too far out of the branch collar we are creating an obstacle that the callus tissue or that sealing off tissue has to grow up and over, and that is what I am referring to when I show these last two labeled parts of the picture. The stub cut is when you cut too far away from the branch collar. The branch collar, again, is that swelling at the base of the tree and sometimes it’s hard to see that, depending on the species of tree, with shrubs it’s especially hard to see because they are generally much smaller stems, but it is easier to find if you feel for it. And what I do if I am having trouble finding where it is, is I just run my hand on the underside of the branch and you can usually feel that swelling right at the base or near where it joins the tree. So if you can’t see it, you can always find it by feeling for it. So a stub cut, again, is where we make the cut too far away from the branch collar and we leave it, literally a stub of tissue. By leaving a stub cut, we are actually slowing down the sealing off process because that callus tissue has to grow up and over the stub in order to seal it off. If the stub is too big, as this one is, then by the time it seals, if it ever does and a stub this size would probably not seal for many years if at all, by the time that callus tissue is able to seal it off, some sort of decay or rot or fungal disease has probably found its way into the branch and through the branch into the trunk, so it’s important to not leave stubs when we are making our pruning cuts.

It’s just as important, if not more important, not to make flush cuts, and that’s that lower yellow line. This used to be the fashion among some arborists when they wanted to make it a nice smooth cut right up against the trunk, but in doing that they actually removed a lot or all of the branch collar, which meant that the tree didn’t really have the
kind of tissue that it needed to seal off the wounds, so flush cuts actually create a very long lasting wound, sometimes one that never seals, and usually right up against the trunk or in the trunk itself, which is of course the last place that we want any sort of decay.

Slide 7

All right, well let me take you step by step through a good natural target pruning cut just to give you an idea of what I am talking about and hopefully illustrate the point from that last slide of the birch. Step one, of course, is to identify the branch that you are going to prune off. Step two is to make an undercut on the branch you are going to remove. You want to make it at least third of the diameter of the branch, actually a third works best for me, I've experimented with different depths and a third seems to work the best. The reason you make this undercut is to prevent what we call branch tear-outs. That's where when the branch falls when we are making our cut, it actually holds onto part of the bark and tears it out, tears it away from the branch and also sometimes the trunk. I will show you a picture of that. The reason we want to avoid that is that branch tear-out slows down the, it actually creates a wound in the trunk of the tree that we are trying to avoid with our natural target cut. Okay, so we've made our undercut about a third of the diameter of the branch we are going to remove, or a third of the way.

Slide 8

The next step in our pruning cut is to remove the branch, so we are going to start from the top of the branch, and in this case just above where I have made the undercut. We are going to remove the entire branch, just cut all of the way through. Because of the undercut, when we did remove that we did not have any branch bark tear-out and we got rid of most of the weight of the branch. So now we just have this little stub left, and when we make our final cut we don't have to worry about a big heavy branch trying to pull that bark loose or create a wound on the trunk. So step four is to make that final cut. You are going to find the branch bark ridge, and I have identified that here with the blue arrow, you are going to start at that branch bark ridge and angle away from it just slightly, and what I like to do is line up the saw so I know exactly what angle I am going to take and I make sure that where I finish the cut at the bottom of the branch is still going to be outside of the branch collar. It's a really good idea to look at the branch from both sides before you make this final cut so you make sure you are not either cutting into the collar or leaving a stub. All right, so we make our final cut.

Slide 9

And here is what we are hopefully left with. This is a branch removal that is not a flush cut, it's not right up against the bark, we haven't removed any of the branch collar, but it's not a stub either. And if you didn't hear it before when I said it, trees don't heal, they seal the wound to prevent decay from entering the tree and if you didn't listen this time, I am probably going to say it about eight more times before the end of this presentation.

Now this is a branch that was pruned off several years ago, and this is what it looks like when the wound is sealed off. You can see this different texture of bark in the center of the picture, that's the part of the bark that doesn't have any moss yet, but you can see
that it looks kind of like a doughnut and we know that this cut was made just right because it's got that perfect circle where the callus tissue was able to close off the wound, to seal off the wound. Right at the very bottom it looks like there may have been just a little bit of a tear-out of the bark right there, but that has sealed off just fine and so that's nothing to worry about in this case.

**Slide 10**

Well, it wouldn’t be a pruning presentation without some horrifying pictures of improper pruning cuts, and this is an example of a stub cut. I, in the picture of the birch, kind of exaggerated the stub cut. This is exaggerated even more. This pruning was done on a willow tree that was right along a fence line and the neighbors on the other side of the fence from the neighbor who owned the tree, did some pruning because they were worried about the branches hanging down. So they did some pruning here and they did leave some stubs as you can see. It’s hard to tell without anything for scale in this picture, but these stubs are about three and a half to four feet long. So if you think about the branch collar having to completely grow up the side of these three-feet long stubs in order to seal off the wound at the end, that would certainly take years if not decades to complete and probably the tree would have long since have fallen over from the decay that had worked its way into the trunk from this open wound. I told you earlier I’d show you a picture of a branch tear-out, and here in the lower left of this picture we have a stub cut, so first of all the cut was not made correctly and they didn’t make that undercut so when they made their top cut to remove the branch, the bottom of it held on, the bark there was still connected and as the branch fell it just pulled the bark right off the branch and right off the trunk of the tree, leaving probably about a two-foot long wound in the trunk of the tree itself. Willows are notoriously prone to decay, so this is kind of a problem for this tree.

**Slide 11**

Well, let me show you some more improper pruning cuts. This is called topping. Now when we make a natural pruning cut we are pruning where a branch either meets the trunk or another branch, and that is where we are finding that branch bark ridge and the branch collar. When we don’t prune back to a side branch or to where a branch meets the trunk, we are pruning between what are called the nodes, the branch nodes or the leaf nodes. When you cut in that internode, that’s called a topping or a heading cut. In this case I am calling this a topping cut because they cut the top right off the shrub. I thought at first they were preparing to remove this plant, but it stayed there for weeks and months, and so finally I took this picture. I don’t know if they thought it was going to grow back from this, but it didn’t. This was sort of the end of this shrub’s life. You can see, kind of in the middle of the stump on the left hand side there is sort of a raised branch collar there, they could’ve cut back to that if they were removing one of these trunks, but they didn’t do that. All and all, just a very poor pruning job if that was what it was supposed to be.

Heading cuts. Heading cuts and topping cuts are terms sometimes used interchangeably. I said just a minute ago that you needed to cut back to where a side branch came out from the trunk or from the branch. What I didn’t say, and what apparently these arborists didn’t know was that when you prune back to a side branch it
needs to be at least one half the diameter of the branch you are cutting, so you want to prune back to a branch or a trunk that is at least half the diameter of the branch you are removing. That is so there is enough tissue in the part of the plant that is left to seal off the wound that you are creating. Well clearly, the branches that are left here, if you are looking at the top of this tree, and I use the term tree fairly loosely I think now it’s a post-modern wooden sculpture, if you look at the top of the tree the branches they have cut back to, well in some cases they haven’t cut back to branches, they’ve left stubs, but they haven’t cut back to branches that are anywhere near half the diameter of the branches that are left so there is not enough tissue in the branch collar of the branches that they have left to seal off the enormous wounds in the trunk that they have created. This tree is really never going to be the same. If you look down towards the bottom of this picture, you’ll see there is a for sale sign down there and the tree right behind it is about what this tree looked like before this job was done, so if you imagine that becoming what you see here, it was really kind of a sad situation. It was actually sad for everyone, at one point the arborist doing the job dropped one of the huge branches on a parked car nearby and so I don’t think anyone won on this job, least of all the tree. All right, so we want to steer clear of topping cuts and heading cuts.

**Slide 12**

Well, holy cow, I told you how to make the right kind of pruning cut, the natural target pruning cut, I didn’t tell you what kind of tool to use for that job. So let’s address that right now and I’ll talk a little bit about the right tool for the job. You can see a variety of them pictured right here, I’ll start with the pruning saw, you can see that in the upper left. A good pruning saw is really invaluable if you are to be doing a lot of pruning, especially branches of any size. If you are working with trees, especially a pruning saw is something you will need. You want one that is nice and sharp, there are ones that fold up and this one you see doesn’t fold up; there are ones with a curved blade and also ones with straight blades. I know that there are people who take that very seriously and swear by either curved or straight, I’ve used both and I find both equally effective. What I find is the most important when choosing a pruning saw is finding one that is nice and sharp and not the cheapest model, those ones aren’t generally sharp and they don’t stay sharp for very long if they are. So a good pruning saw will help you make good, clean cuts in your trees and in your shrubs if you need to, they’re for a little bit larger-sized branches.

Just below them we have a pair of hand pruners, sometimes called secateurs. These are called bypass pruners and that is because the blade bypasses the guard kind of like scissors do so they actually make a good clean cut in your tree or your shrub. They are smaller so you can really get in close to where you need to be, finding that natural target. And these ones are nice and sharp and if you have a pair of hand pruners you would want to keep them nice and sharp so you could make good clean cuts. I mentioned these are bypass pruners, there is actually another type of hand pruner called an anvil pruner, and rather than working like scissors the blade actually stops against a guard. The problem with these is that they, rather than cut, they sometimes crush the branch that you are cutting with them and that creates a lasting wound, it disturbs or it destroys that callus tissue that can seal off the wound, and so anvil pruners are ones I generally stay away from. Now I understand from people who do
propagation of some woody plants that they use anvil pruners as part of that process. I also know some people who work in the florist industry will use anvil pruners because they crush the woody stems and help them take up water. So if you are in those industries, that’s fine, get the anvil pruners, otherwise stick with bypass pruners and you’ll be much happier, so will your trees and shrubs.

Now when I was learning to prune I had an instructor who had very strong opinions about what kind of tools could and could not be used, and right near the top of this list are the loppers, you see them pictured in the middle of the screen. It was his contention, and I see his point, that loppers, because of their size, these ones are about eighteen inches long I believe, you couldn’t really get them in close enough to that natural target to make a good cut. The advantage of using them is they had a long handle, that meant you had more leverage and you could cut bigger branches with them then you could with the hand pruners, but if you need to cut something that big probably you should just step up to a pruning saw in order to make that cut, or I know a lot of people who do gardening work are a little bit older and just don’t have the hand strength that they used to, there are ratcheting hand pruners that allow you to use hand pruners even though your hands aren’t as strong as they used to be. So rather than loppers, I generally recommend that people either use a pruning saw or those ratcheting pruners. And just as a point of information, the pruners that we are seeing here are actually designed for a left-handed person, so for all of you left-handed people out there, they actually do make hand pruners that are designed just for you, so keep a look out for those when you are shopping.

All right, so on the far right we see a pole saw and a pole clip. These are just a saw and a clip that are put on the end of a long stick so you can reach up higher into the canopy to make a cut. Arborists use these a lot for reaching out to the end of branches. The instructor that I learned from had a lot of bad things to say about pole saws and pole clips. He felt like, again, you really couldn’t see where you were making your cut so you couldn’t make a good natural target cut. The pole clip in particular is very hard to maneuver and get the right angle on a branch so that you are making that cut and most often leaving stubs when you use that. If you need to use a pole clip, chances are you would be better off with hand pruners and a ladder or possibly have an arborist come in and make the cuts for you. Last and certainly not least, at the bottom of the screen we have some hedge trimmers. I won’t even pass on what my instructor used to say about hedge trimmers, but the idea here is that you make a lot of cuts very quickly and they are useful for hedges. The disadvantages to using them is they make hundreds, sometimes thousands of many little heading or topping cuts, leaving a lot of exposed stubs and sometimes making flush cuts and opening up trees and shrubs to some decay. Hedge trimmers tend to create plants that have very dense twiggy growth but with just a thin canopy on the outside, so oftentimes I recommend to people that instead of getting hedge trimmers they just go with a more naturalistic look and let the shrub or the tree grow the way that it needs to. If it gets too big, if you need to make some cuts, make smaller cuts and go with those natural target cuts, rather than planting a tree that constantly needs to be trimmed down.
Well, let’s talk for a few minutes about the timing of pruning. You’ll find as Master Gardeners that a lot of our clients will call with questions about when is the best time to prune my plant, when is the best time to prune my lilac or my quince, and these are good questions I wish sometimes people asked more about the best way to prune than about the time, but these are good questions because the timing of your pruning work actually does have an effect on the plant overall. So here are some things to take into account when you are talking about when to prune a plant with our clients. If you are pruning for maximum regrowth, in other words, you are not trying to keep the plant small, you are maybe pruning for structure on a tree or you are just removing some diseased tissue and you do want the plant to keep growing and put on that maximum amount of growth, then the best time to prune is in the dormant season in the winter months, so November to February or in some parts of the state that would be from September through about April. By pruning during this time you are not taking away any of this year’s growth, you are allowing that tree or the shrub to put out that maximum amount of growth.

By contrast, if you are trying to keep a plant small, well first of all maybe you should have planted something different but that’s an editorial comment. If you are trying to keep a plant small, then the best time to prune would be in the summer, after it has already put on its growth for the year, say the end of June through July depending on where you are in the state and what type of plant it is. By pruning then you’ve allowed the plant to grow, but you are taking that away and it won’t put on a big growth spurt after you have pruned, the way it would if you had pruned during the dormant season. Pruning during the summer actually stresses the plant a little bit, it’s trying to maintain the amount of water in the plant, it is also trying to cope with the fact that it has just lost all this tissue, it’s trying to seal off these wounds, so it does have a little bit of a stunting effect on the plant overall if you are trying to reduce the size or keep it sort of minimized.

When we talk about preserving the flowering of a tree or shrub, especially shrubs I think are often planted because they flower. In general the rule is that you prune after the shrub or the tree has finished blooming, so if you have a spring-blooming shrub, those generally set their buds in the year before, so they bloom on last year’s wood. By pruning after blooming, you are pruning before the buds have been set for next year, so if, for example, your lilac blooms in May and you prune in March, you are actually pruning off the flower buds, but if it blooms in May and you prune in June, then you are pruning the wood before it sets the buds for the following year. If you are pruning a summer-blooming plant, then dormant season pruning is actually the best because those plants will bloom on the current year’s wood. In other words, they come out of dormancy in the spring, they grow, and they set buds on that new growth, so if you prune during the dormant season you are to removing any of the flower buds because they haven’t grown yet. Prune spring-blooming shrubs in the late spring or summer, and summer-blooming shrubs in the dormant season.
Slide 14

All right, well let’s talk for a minute about disease and insect prevention. Because so many diseases are host specific, and actually a lot of insects are fairly host specific as well, I really can’t give you a general rule that applies for everything, but if I could give you a general rule it would be this: You want to avoid pruning in the season when that disease and insect are the most active. By pruning when the disease or insect is active you are opening wounds in the plant that they may be able to use to their advantage to get into the tree or the shrub. So, for example, fire blight is a serious bacterial disease of plants in the Rose family. In other words, quince, roses, apples, all of these plants are vulnerable to fire blight and when it enters the plant either through the flower bloom or through pruning wounds. Now the disease is most active when it’s got fairly cool temperatures and high humidity, as a lot of diseases are, and so when do we find those conditions the most? Usually in the spring. So by avoiding spring pruning of those plants in the Rose family, then we reduce the danger of having fire blight get into the tree or the shrub.

Another example: bronze birch borer is a very serious pest on birch trees on the east side of the state. In fact we recommend that people not plant, especially the white-barked birches, because they are so prone to being attacked by these borers that ultimately kill the tree. There is some evidence that suggest that when you prune these trees in say April and May, you create these wounds that simulate or tell the bronze birch borers that there is a tree in distress, and they are attracted to those trees. Why April and May? This happens to be the time when birch borers are active, they have emerged from the trees that they’ve matured in, that they have overwintered in, and they are flying to their new host tree in April and May, so if you wound a tree during this time there is some evidence that suggests that the borers are actually attracted to those trees. So by pruning at another time, say the dormant season or later on in the summer, you might actually avoid that danger.

All right, some trees and some shrubs as well, but you see this more often with trees, they are prone to bleeding when they are pruned, and that is where they actually drip out of the wounds in the branches, and this, while it’s not a cause for concern – it’s fairly normal and is, as I say, more species specific, so you see it happening very often on maples and elms and sycamores and lots of others – we often see clients who are very concerned. They say they had their tree pruned and now it’s bleeding, it’s dripping this liquid. It isn’t really a cause for concern, in other words, the tree will seal that off or stop that eventually, but in order to avoid that issue altogether, pruning at certain times you can avoid the bleeding of these trees, and usually dormant season is best and early dormant season is better, say around November December. By pruning during this time you actually avoid this bleeding because the water in the plant is not out in the branches, in other words it’s not traveling out towards the leaves where it needs to go, it’s away from the leaves or out of the branches as much as possible.

Last we will talk just a little bit about pruning in cold weather. This is more an issue on the east side of the mountains, but it can be anywhere depending on the species of plant. When the weather is very cold and when you are pruning, there is actually an increased danger of what we call frost crack or some sort of damage to the newly exposed tissue on the tree or the shrub. In other words, that callus tissue that now is
exposed because we made our natural target cut exactly where we needed to, that callus tissue that is supposed to seal off the wound, all of a sudden it's exposed to very cold temperatures and that creates damage, that freezes and can kill this tissue, so pruning in very cold weather, say, well certainly below ten degrees and some would say below twenty degrees, and then again depending on the species, even pruning below freezing sometimes can cause this damage. But pruning in very cold weather, especially below twenty degrees, increases the danger that this kind of cold damage will occur in the newly exposed tissue, so it is best to prune in the early dormant season or in the late dormant season when it is not as cold as it can be. So, in other words, avoid that freeze that usually comes towards the end of January.

Slide 15

Well, I want to introduce you to a new concept now. Branch subordination is probably not something that you've heard of before unless you have worked as a professional arborist or done a lot of reading on pruning. Branch subordination is a way of slowing down the growth of a branch on a tree, and this is most often practiced on trees, not so much on shrubs. So what we are doing when we practice branch subordination is that we are going to remove part of the branch to slow it down, so it slows both the growth in length, that is the branch growing away from the trunk, we are slowing that down. We are also slowing the growth of the girth of the tree and there are several different reasons that we might do this, I am going to get into them in a little more detail later on, but it slows down the growth of codominant stems. Most of you are familiar with the idea of apical meristem or a dominant leader in a tree, that is that one center point that grows faster, grows higher than the branches around it. In some cases trees develop codominant leaders, and that is where one or more other branches are also growing straight up, they are essentially trying to take over that main or central leader role. Codominants are undesirable for a number of reasons and I will get into that later, but branch subordination is a way of slowing down that growth and actually trying to transform them from codominant stems into more lateral branches, or sometimes removing them altogether. Branch subordination, also, because it slows down the girth growth of the branch, it kind of helps allow the branch collar to develop, and what I mean by that is the trunk main branch that our subordinated branch is attached to is going to grow faster in relation to the branch and that will allow the branch collar to develop, you will actually sometimes see the collars appear to swell up, really it's just the tree growing faster than the branch that is doing that. But by doing the branch subordination on a branch that we are eventually going to remove, it will allow the branch collar to seal off that wound more quickly than if we removed it all at once.

Slide 16

So branch subordination, when would we use that? In what circumstance would this be useful? Well it is used on larger branches when it isn't practical or appropriate to remove it all at one time. So perhaps we have a very large branch that is attached to a trunk and we need to remove it for whatever reason. With branch subordination we slow down the growth of that branch by taking just part of it away; the trunk continues to grow at a regular speed and then the branch collar sort of swells up and we are going to give the collar kind of a head start, that's not a technically accurate term but the metaphor is
appropriate. We are kind of giving it a head start on sealing off a wound that isn't there yet, but eventually will be there. As I said before, subordination is used on codominant leaders to maintain that strong central leader, and we want to do that to provide good tree structure. It is also used on low branches on a tree that are eventually going to be removed. Very often when you plant a new small tree there are branches low on the stem that we leave temporarily because they're part of the canopy and they are helping the tree grow and be established. You may not know that branches also help the trunk of the tree grow right just adjacent to where they are attached and so those low branches are actually helping the trunk grow bigger and stronger, so by leaving them their we are contributing to the growth of the trunk. But if we know too that eventually we are going to want to remove them because they are too low on the tree, chances are they are sticking out at eye level or at a place where we need to get past the tree, so we want to slow down their growth and stop them from getting too big so that the wound we eventually make will be relatively small compared to the size of the trunk. So those are three circumstances when branch subordination is really useful.

Slide 17

So what is it? How do we actually do it? When you have chosen a branch that you are going to subordinate, go to the end of the branch and then you look back or you work back on that branch somewhere between a third and a half the length of the branch, sometimes a little bit more or less. You are looking for a side branch that you can prune to, and of course remembering that the side branch needs to be at least half the diameter of the branch you are pruning so that we make a good pruning cut and one that is going to seal off effectively. So somewhere in that one third range, look for an appropriate side branch and prune to that. The next time the tree is pruned, at least a year later, sometimes longer, we take another section of that branch off and keep going until our goal is achieved. Either the branch isn’t a codominant stem anymore or we are able to remove the branch completely. Sometimes this is, in fact most of the time this is a multiyear process. If we were doing it all at once it wouldn’t be subordination, it would just be pruning. With this process we are trying to slow down the growth of the branch, and so that means that it’s going to take at least a year, and often times more. If we are having to remove a very large limb from a tree it may take five years to achieve the goal that we are working towards.

Slide 18

So, this is an example of where branch subordination might have helped this tree. You see the trunk has two very large wounds and on the left the one has considerable decay that has already worked its way into the trunk. On the right you can see that a wound was made much later, but already you see discoloration in the wood from decay and also it look like some bird has started maybe building a house in this tree. If this had been pruned using branch subordination it might have allowed the trunk to get even bigger to reduce the size of the wound in comparison to the size of the trunk and then also allow the branch collar to start sealing off the wound. It would have a smaller wound to seal and it would also have that head start I alluded to earlier. With wounds this size there may be now way to completely eliminate some decay or some rot getting in there, but at least it gives the tree some, a head start or some protection against that rot.
Slide 19

This tree is a little bit healthier than the other ash tree that we looked at, it’s a green ash that’s been getting a little more water to really grow nicely. One of the things when you take in when you talk about pruning trees you have to talk about the location, and here we are sort of close to a sidewalk where we have a lot of cart traffic; over time too we are going to have a lot of foot traffic in this area which means that some of these lower branches need to be removed so we get clearance for people walking by. We happen to be on a golf course, that means we also have to take into account the swing of the golf club, that means we have to prune for clearance for the golf swing. So on this tree these lower branches are important because when we first plant the tree these are the branches that are helping to feed our trunk and helping the trunk to grow in size, making it a nice healthy strong tree. So these lower branches you want to leave on initially, but over time, like I said, we have to take those ones off. In order to minimize the wounding to the tree I am going to do something called subordinative pruning. I am going to subordinate this branch and let it know, in essence, that it is a temporary branch. So what I am going to do, I’ve got this much and I’m going to go about a third of the way down the branch and I am going to cut this right here. That reduces how fast this branch is growing and it allows our branch collar right here to swell to prepare to seal off the wound when we eventually cut the whole branch off.

The branch collar is actually part of the trunk and so we are slowing the growth of this branch in relation to the girth of the trunk and that allows this branch collar to get bigger and eventually seal off the wound that we are going to make. So that is called subordination or subordinative pruning, and all I am going to do is find a spot between a third and halfway the length of the branch from the trunk to the tip of the branch and I am going to find a natural target, that means a place where the branch comes out. In this case I want to make sure that it’s going to be an easy pruning cut just right here, and I want to make sure that the branches coming out at the side, the ones I am pruning to, are at least half the diameter of the branch that I’m cutting, and I can see here that these two are at least half the diameter of this one. You want to make sure of that diameter because that allows this wound to be sealed off as quickly as possible. If I were to cut to a small branch like this, this wound that I am creating won’t seal off as effectively. So I am going to go right here and I am going to make this cut with my pruners. Cutting live tissue with pruners is a lot easier than cutting dead tissue, and so this will go very easily, just like that, and I have made my cut. Now because I cut to these two branches here, this wound will deal off more quickly and over time, probably next year or in two years, I will come back and I’ll finish cutting this branch all the way back to here.

Slide 20

Break Time

Slide 21

Well, okay, we’ve started, I think we’ve got some good tools to work with when we are going to prune. We have talked about natural target pruning, so we know where and how to make each individual cut and I have shown you some of the tools that might help
you make those good proper pruning cuts, and then I have talked about branch
subordination so we know a way to slow down the growth of a branch before we prune it
completely off. So now we’ve got some tools for making individual cuts, let’s look at
pruning as a whole.

I think that the most important tool that you can have when you are pruning is of course
your brain. You want to plan ahead and approach each pruning job by really thinking
through what you’re objective is, and so here are some of the objectives, and I talked
about this at the beginning of the program. You might be pruning to mitigate a hazard or
defect, so maybe there is just one branch that has got a crack in it or some decay,
maybe it’s growing into an area where it shouldn’t, it’s rubbing against the roof of the
house, or growing out into traffic, so maybe it’s going to be a very specific job and you
are just going to remove this one branch or this area of the tree.

Maybe you are pruning to manage disease or decline and so in this case you have
another very specific set of objectives. If you are pruning to manage disease, you have
to identify where it is in the plant that it’s got this disease and then where you are going
to make your cuts, because again, you still want to make natural target cuts even if you
just want to prune out disease because you want the plant to be able to seal off the
wound that we are making. And most of the time when you are pruning to manage
disease you are not going to prune just at the edge of the disease or where you see the
symptoms, you actually are going to prune farther down into what looks like healthy
wood because very often the disease spreads ahead of the symptoms and so the tissue
could be already infected, just not showing symptoms, and so you are going to prune
below the disease in order to manage it. If you are pruning for decline, most of the time
what you are doing is you are trying to reduce either the size of the tree or the length of
some of the branches that might give way, just to kind of to reduce the potential hazard.

A lot of people prune to improve aesthetics, and this is one that is very subjective, so it
is hard for me to tell you exactly how to improve aesthetics when, as they say, beauty is
in the eye of the beholder. You still use good natural target pruning cuts and the right
tool for the job, but ultimately this is going to be up to the individual. And last we want to
promote good structure in the tree, making those choices now that help a tree grow a
good structure over time. So I would challenge you in the next week or so to look
around at some trees or shrubs, and they don’t have to be yours, they don’t have to be
ones that you will prune as you are out and about and maybe identify ways that you
would prune. So look at a few shrubs or trees and look to see if you can identify some
branches you might want to either remove or maybe you would like to subordinate. Try
and find where you’d make the natural target cut and then look at the plant overall to
see how you would prune it to either mitigate or to manage or to improve or to promote
good structure.

**Slide 22**

Well, it might seem strange to put these two types of pruning together, improving
aesthetics and promoting good structure. I just said a minute ago that aesthetics was
pretty subjective and promoting good structure has a little more objective nature to it, in
other words you have certain rules that you follow, but in both cases you are going to
prepare for that pruning project by following the same set of rules. Actually you would
follow those rules for just about any type of pruning project, but especially for these. So first you are going to look at the entire plant and you are going to look at it from all sides. If you pruning just to manage disease or to mitigate a hazard you are just going to look at where the hazard is so you can mitigate that. With this these types of pruning you want to look at the entire plant, you want to look at it from all angles so you really get an idea of what it looks like now. Then you want to identify potential removals, where are you going to make your cuts in it to improve the look of the plant or to promote good structure. And then you want to visualize the final result, so it’s best to begin with what you’re working for so you know whether or not you’ve achieved that goal, and during the pruning process you know what steps or what decisions you need to make to work towards that goal.

When you are first pruning, I know some people are a little reticent to make that cut, some people I wish were a little bit more reticent to make their first cut. To some people who are a little anxious about it, I would recommend this and it might work for everybody, before you make your first cut go through this whole process to identify your potential removals and what I did when I started pruning was I would take a little piece of twine and I’d tie it around the branch that I was going to remove. I would tie it near where I was going to make the cut so I would know how much of the plant was going to be effected, and then I could look at the plant from all sides. Before I had taken anything away I could look at and I could see where these little colored pieces of twine or colored pieces of plastic, whatever works best for you, were. And that way I could trace out with my eye what branch was going to be affected and how the plant would look if I took that branch. You don’t have to do what I did, I was so anxious about it that I actually left the twine on for a couple of weeks and kept coming back and looking. You don’t want to over-think it too much because you will never get your pruning job done, but it is sometimes very useful just to tie on some twine and that helps you visualize the final result before you get started.

Slide 23

So, here is an example of pruning for esthetics. Now this is a Korean boxwood that was pruned probably with hedge trimmers, so maybe some heading cuts were made there, but it is something that is awfully cute. Topiary is something that, even if it isn’t the best for plant health, it can be kind of whimsical like this or it can really add a lot of appeal to a garden. So in this case, before this person went out to prune they were visualizing, I think I was told this was supposed to be a swan, to me it looks a little more like a turkey, but they were visualizing their end result before they started, before they picked up the pruners.

Slide 24

All right, well in several slides before this I have alluded to improving tree structure or building good tree structure. What the heck am I actually talking about? I want to go over some ideas to hold in mind if you are pruning to develop good tree structure. These are some ideas that you keep with you as you are planning your pruning job. So I said before to think of a tree as a house that grows itself or builds itself, and what I mean here is that we are looking at the structure, the way the tree grows, from the standpoint of will it be able to hold up in a windstorm. Most of the time when we think
about pruning we address plant health issues, we think about the aesthetic appeal of the tree, we are not really thinking about what is going on inside the tree. How is this tree going to withstand the environment that it is in after we are done pruning and how can we develop a good structure that going to help it withstand the environment that it is in.

So here are four things to keep in mind. First of all, you want to develop a strong central leader. A lot of scientific study has gone into this and the end result boiled down to a very short report here is that the best structure for a tree is one that has a strong central leader. Essentially it is a cone shape so the highest point is in the middle and then the branches spread out from there. So from a structural point of view, that meets the tree’s needs the best, so we want to prune to train or develop or encourage having that strong central leader.

We also want to remove crossing or rubbing branches. Obviously branches that rub up against one another are doing some damage and over time they can actually wear away the bark and allow disease or insects to get in there so we want to remove those or at least reduce them. Branches that grow from say one side of the tree all the way past the trunk and grow out past the side, those are ones that we can reduce or eliminate because the tree generally doesn’t need those branches, it’s got branches on all sides of the canopy to get the sunlight, it doesn’t need branches that are crossing through and potentially rubbing or injuring parts of the tree. Also, the more branches that a tree or shrub has in the center of the tree, the less air circulation will pass through there, and when we don’t have good air circulation in the tree, that allows more diseases to infect the tree. Generally good air circulation blows the spores or the bacterial cells or whatever it is on past and they don’t get a chance to float down and rest on the leaves or the trunk or wherever they are headed, so we want to encourage good air circulation in the tree by eliminating a lot of these crossing branches.

We also want to eliminate included bark. I am going to talk about that more, but included bark is where a branch is not well attached to the trunk or to another part of the branch, and this can present a hazard over time. So we want to eliminate that where we find it and we also want to eliminate having too many branches come from one point. I see a lot of trees that are pruned in nurseries to have a lot of branches coming out. They come up three or four feet and then have two or three branches coming from the same point. It’s an aesthetically pleasing look because the tree appears more full, but over time, as these branches grow they actually stress the trunk or create a stress point on the trunk, so we want to get better spacing of branches. Ultimately we want to have branches which are spaced fairly far apart on the stem, and the actual spacing depends on the ultimate size of the tree.

A large shade tree you may want branches spaced as far as eighteen inches apart, or some smaller trees maybe it’s only a matter of a few inches, four to six inches perhaps. So you want to space the branches out, you also want to encourage the branches to grow on all sides of the tree so you have a well balanced canopy, and that also helps the tree deal with stresses like wind.
Slide 25

All right, well, first on our agenda for developing good tree structure is to promote a good central leader. On younger trees, probably the most important thing that you or our clients can do is to promote a good strong central leader is to remove some of the competing branches. So what is the central leader? I think I've said before that that is the highest growing point, it should be at the center of the tree. If you think about a pine tree that has that one straight stem that grows higher than the others or at least it should have one straight stem, it's that dominant leader that grows above all of the other branches. Having that strong central leader means better tree structure, in other words, all of the environmental influences that act on the tree are better managed by it if it has that central leader and that cone shape. Not all trees can have a cone shape nor should they all have it. One of the great things about trees is that they have such a wonderful diversity of growth habits, but there is a way to encourage a central leader to develop and still respect that growth habit, and that way we are getting the best of both worlds. We are getting good structure that is going to resist environmental stresses, but we are also allowing the tree to be what it is supposed to be.

So, in order to help develop that leader we want to remove or reduce codominant branches, and I think I said before that codominant stems are ones that come out of the main trunk but they grow straight up and they try to take over that leading role. When there are multiple leaders or codominant stems it negatively impacts the structure of the tree. Meaning that over time they get larger, they try to grow more vigorously than the trunk so then they are more at risk of tearing away from the trunk and creating a large wound there. So we want to reduce the codominant branches and there are ways of slowing them down with branch subordination that will help us develop them either into lateral branches or in some cases removing them altogether. All right, so the next step I need to address is that there are different tree growth habits, excurrent versus decurrent growth, and let me show you some pictures of those.

Slide 26

So an excurrent growth habit is a tree that naturally has a strong central leader, and here we have this maple tree, this is a Norway maple that, at least in this stage of its life, has a strong central leader, no codominant stems here. So think about trees that are upright or columnar or have sort of a parameter shape, and actually a better example of this excurrent growth habit than the maple in this picture are the Ponderosa pines all around and behind it. A lot of conifers are really strong excurrent growth habit as I have listed here. A lot of conifers, maples, ash, beech, some of those big shade trees have that strong upright growth, and naturally have that central leader so it is easy to keep that growth develop.

Slide 27

So if a tree doesn't have excurrent growth habit, that natural strong central leader, it might have decurrent growth habit. And it's not important to remember this term, but it is important to remember the concept that some trees have this kind of naturally spreading growth, so think about trees that are globe-shaped or vase-shaped. Most of the fruit trees fall into this category: apples, apricots, peaches, cherries. Elms have a
very strong vase shape, in fact that is often what they are planted for is that really beautiful vase. Magnolias, honey locusts with their really irregular growth habits, Japanese maples also have kind of a vase shape very often. I am not saying that these are bad shapes, in fact they are really beautiful, but what I am saying is that they lend themselves to some problems in the structure of the tree over time. And they can be pruned, when they are very young, to develop a little bit stronger central growth so they have a little better structure, a little stronger wooden structure that will help them resist the stresses that they will face throughout their lifetime.

So this picture here is of a crabapple tree, and we’ve got this one branch that comes off here at the bottom and goes way over to the right. Now I certainly wouldn’t remove this branch now and I wouldn’t try to retrain this tree or renovate it, but what I do notice about this is that it’s got a lot of its leaf canopy, a lot of the active growth is way far away from the trunk, so all of this weight of the leaves, the weight of the fruit if it produces that, is all going to be way out at the end of the limb which is going to make more force or produce more stress on the trunk where it joins. If that branch were to fail, and it’s more likely to fail because it does have all of that weight way out there, it is going to create a very large wound in the trunk. In fact you can see that branch is almost the same diameter as the trunk itself, so that is a potentially life threatening wound if that branch were to split out. Now if we had pruned this to develop a stronger leader when it was a younger tree, then it wouldn’t have this particular form and it might have had a better structure overall. This tree, as it stands, is really unique and I don’t think I would change it now, but it does face certain risks that it wouldn’t if it had been pruned better when it was much younger.

Slide 28

When I talked about pruning for good structure I alluded to crossing, rubbing branches and no tree illustrates this better than the English hawthorn. You can see quite a few crossing and rubbing branches and so this might take several pruning sessions or several attempts at pruning to bring these trees to a little bit more semblance of order, but what I would advocate here is start with the trunk as sort of a dividing axis. Think of that as the very center of the tree and then prune those branches that cross from one side to the other, and you can see that there are a few of them here that start out on one side of the tree and they cross all the way over the center of the tree and come out the other side, so those are ones that ultimately are not good structure and they are also interfering with good air circulation in the tree. These trees are prone to leaf spot diseases anyway, and so with the lack of air moving around, air that might otherwise blow away the fungal spores from the leaves, with the lack of air blowing through these trees I would almost guarantee you would get a leaf spot disease that is pretty unattractive.

So we start by removing some of those crossing branches. If there is a choice, remove the smaller of the two branches. If there are two branches rubbing together remove the smaller one if that’s appropriate, if that makes the most sense. Now you don’t want to remove all of the branches from the interior of the tree. If you remove too much you get what is called lion’s tailing, and that is where the tree looks sort of like the tail of a lion or a poodle where all the leaves are at the very top or out at the very end of the branches, and that is not good either for the health of the tree because it doesn’t have enough leaf
canopy to support the roots and the trunk; it’s also not good structure because we are putting all of the weight out at the end of the branches. So you want to remove the crossing and rubbing branches that are presenting a problem in the tree, but you don’t want to completely clean out the inside of the tree.

**Slide 29**

Okay, well we have talked about developing or encouraging a central leader and also about removing crossing, rubbing branches, so let’s look at some examples. This is a Norway maple tree, and as you can see here we have multiple leaders or codominant stems in the tree. If you go to the base and go four feet up or probably closer to five or six feet up you see that it has three main stems all coming off from the same point. Now this tree is obviously in fairly good shape, it doesn’t have any big broken branches, and so I don’t want to give the idea that I would renovate this tree or try to prune it in such a way that we would change the way that it is growing now because it has lasted for a long time this way, and so I am not saying that we need to change this. But we could’ve improved the structure or the way that this ultimately grew by doing some structural pruning early on in the tree’s life. So you can see that it does have these multiple leaders. They are all coming from one spot in the trunk, and you can see that that one spot is probably about twelve to eighteen inches, so as these leaders move in the wind or under load from snow or just having leaves on the tree, which adds a lot of weight, they are putting stress on that one part of the tree. If we developed one leader in the center, the branches would have been evenly spaced out on that leader and the stress of that environment would have been spaced out all along the trunk of the tree. Instead we have three fairly significant sources of stress all moving against each other or independently of another on that one section of tree.

Now this tree is in the neighborhood where I live and so I can tell you that it has been through a few pretty big events, it’s been through a fairly big ice storm and a lot of wind storms, and come through just fine. But, in a really catastrophic event, say seventy mile an hour winds or something like that, this is the area of the tree that would be prone to fail, is right where those multiple leaders come together. This is another picture, actually a picture of a different tree where we have several codominant stems, it looks like three codominant stems coming from just about the same spot on the trunk. We also have some other branches here we can see up about two thirds of the way up the picture we can see that there is a fairly large branch that is rubbing against another one and then we have some that are growing on the inside of the tree, probably reducing the air circulation. So several things working against this tree, but the most serious one is the codominant stems on this one, all competing against each other and also putting stress on the trunk in that one section.

**Slide 30**

So here is kind of an example of what we might do to prevent some of the problems that we saw in the last couple of slides. On the left you see a tree that has a few problems with it, not many but just a few. We’ve got branches that are spaced pretty close together on the stem, even at this younger age you can see that some of these branches are going to be pretty close together if they are allowed to stay. We also have some of those what is called codominant leaders, that is several branches are growing
straight up trying to be the main central point in the tree. We only have room for one
central leader on the tree, so what we would like to do is remove some of those
codominant stems, and we want to start the process of spacing out the branches along
the trunk. So in the second picture, the one on the right, you see that we have done
some branch subordination. In other words, on some of those branches, those
codominant stems that were growing straight up, we have removed part of the branch to
slow down the growth. We have left the branch there because we don’t want to take it
all the way off, but we have slowed it down so that now we are going to develop that
strong central point on the tree that is going to lead to a better structure long term. We
have also started to space out the branches on the trunk. We have taken some of the
smaller branches completely off the trunk in order to build that strong foundation and to
reduce the chances of having too many branches come from one point on the trunk.
Now eventually we want to have, this is going to be a larger shade tree, so eventually
we want to have the branches spaced about eighteen inches apart if we can. That is
the ideal. It doesn’t always work that way because we live in the real world and so do
trees and so we can’t always get that ideal spacing, but that’s kind of the target that we
are shooting for. You can see that we have made a lot of little cuts on this tree that are
nowhere near the size some of those big cuts would be if we waited and made them
later in the tree’s life.

Slide 31

Well, here is an example of too many branches coming out of the tree at this one point,
and codominant leaders. This is a London plane tree, and you can see right at the first
branch that is coming out of the trunk, I think that is about four or five feet up, we’ve got
the main trunk, we’ve got a side trunk coming off to the left that is trying to be the main
trunk – in other words it is a codominant stem – and if we leave that there, if we don’t
address that, we could have problems later on. We also have two other branches,
some lateral branches, coming out of the side, and all of those are acting in that same, I
think it is about a foot high, that same part of the trunk, so over time all of those
branches are going to be growing, they are going to be pushing against each other; in
other words, as they grow in girth they are going to be pushing apart or pushing each
other apart, they are also going to have the force of that weight acting at that one spot
on the trunk.

Slide 32

Here is a close-up view of that, and in this you can see that all of those are really too
close together there. You can see also that they even removed at least one branch that
was also growing in that section already. So here what we have are some candidates
for branch subordination, in other words we might start at the tip of at least one of these
side branches, maybe both, and start to remove part of the branch every year or every
other year until we either slow down the branch or until we remove them entirely, and in
this case I think we might want to remove at least one, well I know we want to remove at
least one and maybe both of those. At the same time, higher up in the tree, we want to
remove or subordinate the codominant stem that is on the left so that that slows down,
we don’t want two trunks, we just want one trunk because that is going to build a
stronger tree, a stronger structure.
Slide 33

When you plant a small tree like this, this one is getting a little larger now, but when you plant a young tree one of the types of pruning you want to really be aware of is structural pruning. That is, you want to build a healthy structure in the tree. Aside from it being healthy you want to build a tree that is able to withstand wind and snow load, and so one of the things that really helps a tree withstand all of those extremes of wind and snow is correct branch spacing, or good spacing between the branches on the trunk. You can see on this one that we’ve got a nice distance between these branches. For a small tree like this, this is great, all these branches are spaced fairly far apart on the branch up and down, and they are also spaced around the trunk, so we have them on all sides, that helps the trunk withstand wind and other stresses. But up here, high in the tree, and I will point at it with a saw, we see that branches are pretty close together, and these are larger branches that as they grow in girth they’re all going to be more congested. They are all essentially going to be coming from the same point on the trunk. That means that when they move in the wind or bow under snow load, they are all going to be acting on that same point of the trunk and they are all going to be pulling in different directions. Over time that is the kind of thing that could lead to some branch tear-outs or even to the having the trunk split out.

So I am just going to climb up there and I am going to take one of those branches today and then next year maybe I will come back and take another one. When I am looking at these branches spaced too close together all in here, I have some decisions to make. Which branch do I take off? And probably the one I choose is this one here because not only is it the smallest one, but by removing this one I am actually creating some space right here, so right away I am giving some good branch spacing. There is this one on the other side I might take that next year, I don’t want to take too much at one time. I could take both of them at this time, this tree is healthy enough that it could withstand that, but right now I’m just going to take this one branch. So I am going to, just as I always do with pruning cuts, I am going to start by, this is going to be a three part cut, I am going to start by taking the weight off the branch and I am going to undercut here. This cuts the bottom part of the branch so that when I make my final cut, this branch, when it falls, won’t pull some of this bark off down here. So I have severed that and now I can make my removal cut right here coming from the top.

When you make the undercut you want to cut at least a quarter of the way through the branch, and then this top cut here cutting the whole thing, throw that off, and then my final cut is going to be right here next to the branch collar, and I am going to get as close as I can to the branch collar which is right here – that is that tissue that is going to seal off the wound that I am making – and I am going to make a straight cut right here. Because of the angle I am working from it is easier for me to cut from below. You don’t have to make this cut from below, in fact it’s frequently easier to make it from up above, but whatever direction allows you to cut outside of the branch collar but as close as possible. All right, now I have made this cut, I haven’t cut into the branch collar, and I haven’t left a stub on the tree, so this wound will be able to seal pretty effectively and then next year or even later, I can come back and take this branch and then we are spacing out these branches a little more and that will help build a healthy tree structure.
Okay, dealing with included bark. This is a big aspect of promoting good tree structure, so let me define what this is first and then we’ll talk about how to deal with it. Way back at the beginning of this program, what was it six or seven hours ago? I showed you a picture of the branch bark ridge and said that the opposite of that might be a branch bark valley or included bark, which is the technical term that we use. This occurs when the main trunk and the branch are growing larger in girth, so each is getting larger or bigger around, and instead of the bark pushing up against each other it actually pushes down, and the tree keeps growing around it so there is this seam between the branch and the trunk. This is more likely to happen with a very narrow angle of the branch. You can see here that whichever one of these two is the branch, it is growing more or less straight up, it is not growing out as most branches would, so the angle of the branch growth has a lot to do with whether there is included bark, because over time, as the tree keeps growing, the bark is covered and pushed up against each other. These, the branch and the trunk, will continue to grow and push against each other, which creates a real weak spot in the tree. So let me show you what this looks like in cross section, give you a little bit better idea of what’s going on inside.

Okay, well here is a picture of what is going on inside the trunk of that tree from the last slide, and you can see that unlike most trunk and branch growth, there is actually a barrier here. So, in other words, most of the time the branch and the trunk are growing right next to each other and they are laying down successive layers of wood that interlock and so overtime the branch is really well attached to the trunk and that’s what holds it up against, first of all gravity, but also things like windstorms or very heavy fruit production or snow load or just holding the canopy up. In this case, because we don’t have a branch bark bridge, the bark is down between the branch and the trunk and it’s not laying down those interlocking layers of wood. Instead, they are growing and actually pushing against each other, so over time if nothing else happened, if the tree was growing where there was no wind and no snow load or fruit production, over time the trunk could literally push the branch away to where just gravity would cause it to fall out.

Most of the time it doesn’t get to that point because this included bark, besides forming a barrier, also forms a pathway for decay. At the very least, water gets in here and, as we know, during the winter water freezes and thaws which creates cracks in everything from trees to sidewalks, so we have that mechanical damage that is going on with the freezing and thawing of water that gets in here. As that is happening, decay, fungal spores, that can decay wood, is also finding its way down into here, so it’s creating an even weaker spot, so we have an attachment that is not good, we have the mechanical damage of water and also of the branch and the trunk growing against each other, and then we have some sort of decay that can find its way in here and create a weak spot.

Here is an example of what might happen to a tree with included bark. This was a
windstorm and it looks like this was either a maple or actually it is probably a
Liquidambar, a sweetgum tree, that this has happened to.

**Slide 37**

Here is a close up of that same tree, and you can see there was included bark here that
led what is pretty clearly some rot into the main trunk of this tree. So eventually, in a
wind storm that branch that did not have good attachment to the trunk of the tree, split
out or ripped out under the stress of the wind and now we see this rot that is really
severe in the heart of the tree. This tree will probably have to come down eventually,
certainly it is not going to enjoy a long life, or at least not one as long as it could have
had that included bark been dealt with when the tree was much younger.

**Slide 38**

All right, as an arborist I am practically required to give this statement, but I say it also
because it is true. Topping is always, always wrong, and I showed you those pictures
way back at the beginning when we were talking about proper and improper pruning
cuts, well here is just some added emphasis on why topping cuts are wrong. First of all
they are not made at the natural target like I showed you, so that allows decay to get
into the trunk of the tree or into the branch. It also, topping causes flushes of these
poorly attached, what we call “waterspout” branches. So they are branches that are
attached only at the bark, so the outer layers of the branch or of the trunk rather than
having grown and attached from the inside. That means they are much more prone to
split out or tear out under stress. All right, topping also increases the hazard level of the
plant because it doesn’t allow the plant to seal off the wound, so it allows decay into the
tree which, over time, weakens the structure of the wood and increased the hazard.
Also, those poorly attached branches can grow to be fairly big size, and if they were to
rip out or tear out in a storm, they could fall and potentially hurt someone or something.
It adds a lot more maintenance to a tree to top it because you are having to go back and
thin out those waterspout branches at the very least, and at most you are going to have
to go back and eventually remove the whole tree or take the tree down, which is a lot
more trouble than it is worth. It permanently disfigures the plant and it just plain looks
ugly. I think at this point that most people understand that a topped tree is not a good
look, and now we know too that it’s very hazardous to the tree and to, potentially, the
people walking underneath it, so topping is always wrong.

**Slide 39**

This tree, again an English hawthorn, was topped several years ago, and you can see
that it has had some very vigorous regrowth. It is poorly attached, usually right at the
end of the branch that was topped, and now we have a lot more growth to thin out. We
have a tree that is already fairly prone to decay in the stem, and now it has opened it up
even more to decay.

**Slide 40**

So here we have, the red arrow shows where the tree was cut several years ago,
probably five or ten years ago, and from that one cut have come one, two, three four,
let’s just skip through these really quickly. One topped branch has become fourteen overcrowded branches. All of these are very poorly attached to the branch, so they are much more prone to tear out, they are crossing against each other, they are rubbing against each other. Trying to get in here to clean these out, of course being a hawthorn there are a lot of thorns in there, so the maintenance issue on this has not just doubled or tripled, but I don’t know the word for fourteen-abled, but we have created a maintenance nightmare here.

Slide 41

Okay, well let’s just go through an example here. We will prune this tree for structure and I will do some of the things that we have talked about leading up to this point, some branch subordination, and look at ways that we might improve the structure of this tree, and it looks like it could use some improvement here. We want this tree to be around for a long time, we want it to be nice and healthy and have good strong solid branches, so let’s just go through this and we will use some of the ideas that we have learned so far in this presentation. Now I should say first of all that this tree, we will assume this has been in the ground for three or four years, so it is well established, we are not going to be stressing it out by pruning it right after it was planted, and we should first of all probably remove the stakes. This tree doesn’t need to be staked anymore, if you haven’t heard by now, make sure you remove stakes from a tree after no more than a year because after that the tree starts to become dependent on the stakes, but this isn’t about planting or staking, this is about pruning.

So let’s just go through this tree, and that first yellow arrow shows where suckers are coming up from the roots, and we don’t need those, in fact we don’t want those. A lot of trees are grafted and so chances are these suckers might not even be the same tree that we planted here, so let’s start by removing those. We don’t want a shrub, after all, we want a good tall shade tree. This is a red maple that they planted in the parking strip, and we want one that is going to be good and healthy. All right, so now we have this branch that, if we follow this second arrow, follow that down the branch to where it attaches. It is fairly low on the tree, and that branch grows out towards the street, so we know if we don’t do something, eventually that branch is going to grow out into traffic and we don’t want that. So right now we will make a pruning cut and we will subordinate this branch. We will find our natural target, which is right around where that arrow is, and we might cut, it looks like we can cut the larger branch that is on the right. I am not sure if that smaller branch on the left is fifty percent of the diameter or not, but we can cut that branch back. That will slow down its growth, but we will leave the branch there because if you look at it in comparison to the size of the trunk of the tree, it’s a pretty big branch, and we don’t want to create a wound that big on this small tree.

Also, if we subordinate the branch, it is still contributing to the growth of the trunk, so we can still have that strong healthy trunk, but also let this branch know it’s temporary – eventually we are going to remove it completely. Well now, where this third yellow arrow is you can see if you follow this smaller branch going off to the right it actually crosses and rubs on at least one if not two other branches. Well that certainly is not desirable and if you look at where it is attached on the trunk, it is right next to a much larger branch. Over time those two are going to get bigger and they are going to start pushing against one another, it is not going to work out to the advantage of the tree to
have those two branches there, plus this is fairly low on the tree, eventually probably both of those branches are going to disappear, but we’ll start with this smaller one – the one that is rubbing against the other branches and is also too close to that one side branch, and we are going to cut it all the way off. That way we are removing the potential for injury from the rubbing, and we are helping space the branches a little bit better on the tree.

And lastly we have another pair of branches that are just too close together on the tree, they are growing too close. We don’t want both those branches in one spot. Now we might choose either one of these to subordinate, these are a little bit larger branches, so instead of removing the whole branch we might just take part of it and then come back in a year or two to take more of it. I’m not sure which we would go with. We have two choices, there is the branch that goes off to the right, and that might, I can’t tell from here, eventually grow out over that sidewalk, so that might be the one that we subordinate or we might go with the one on the one on the left because we have two branches fairly close to each other on the trunk that are going off to the left and we do want to kind of balance the tree, there is that aesthetic issue as well. So it might take some consideration and I think if I were pruning this tree I would choose the one on the right because it looks like it’s the smaller of the two, and that creates the smaller wound on the trunk. So really that’s all we would have to do right now, if we saw more of the tree we might see some codominant stems, but at least for what we are seeing right here this is all we would have to do with this pruning session, and we have started this tree on the path to some good tree structure. We could do more, but we don’t have to at this point, we could let it grow another year and get more development in the trunk, be a healthier tree and then come back and do a little bit more pruning.

Slide 42

Break Time

Slide 43

Well, let’s talk about shrubs! I’ve been doing a lot of talking about pruning and some of it really applies more to trees than to shrubs and really they’re their own animal, or they’re their own plant I should say. Shrubs differ from trees in that they are able to recover from pruning more quickly because of their smaller size. Most of them are a little more vigorous in their growth, not always, but a lot of them are. And also the wounds we create in them are smaller usually so they’re able to recover more quickly. Shrubs are much less likely to suffer structural failure just because of their smaller size. That doesn’t mean it can’t happen, but they certainly don’t have the same issues that say a 70-foot maple tree might have when it comes to structure. Many times their growth habits are not dependant on a single trunk. In other words they’re not miniature trees, they have a much broader growing habit. They are cane growers where they have multiple stems growing out of the ground. A lot of them have multiple trunks or maybe they’re a groundcover type shrub where they might have one stem coming out of the ground but they could be rooted in several different places. Timing can be a little bit more of an issue with shrubs. Most of the time it seems that shrubs are planted for blossom, sometimes for fruit production and so sometimes timing can be an issue there. Now don’t tell anyone I told you this but shrubs are a really good place to practice your
pruning techniques because they recover generally more quickly than others they’re a good place to kind of cut your teeth. If you’re worried about pruning, if you’re a little nervous to get started, start on a shrub. That said, don’t start on a really expensive shrub or a slow-growing one or a difficult one say like some of the rhododendrons can be. Start on one that’s a little easier to prune with and if you don’t have one, maybe a forsythia or lilac, it’s almost impossible to kill by pruning

**Slide 44**

Ok, first of all let’s just say no to shearing. I got this picture from a co-worker and a friend of mine. This is forsythia; a lot of you know these plants as that bright yellow blooming plant that really just says spring is here. In this case I’m not sure, I think it’s more saying spring might be on the way. Or maybe because of the shape of these it’s saying Easter is coming because these kind of look like Easter eggs. Well at any rate these are forsythia that have been sheared and so you see this very definite form, from a design standpoint the repeating shape might be pleasing or they might be part of overall design of the landscape. But really what strong healthy plant says spring is here or is it….

**Slide 45**

…this! Now this says spring is here. These are forsythias that have been pruned but they haven’t been sheared. And I think overall they give a much more natural effect. The bloom is much more impressive on these, of course, and overall it says that this is a healthier shrub.

**Slide 46**

In this case it’s more than just saying no to shearing, this is oh no! This is a flowering dogwood. This wanted to be a tree, a tree that could be up to 20 feet tall and they’re just beautiful. Most of us remember seeing flowering dogwoods at one point or another. This one has been sheared and it’s not a flowering dogwood, I’m not sure what this is anymore. But certainly it'll never be what it could have been, and certainly not as beautiful as it could have been. What we’ve done here by shearing is actually created hundreds maybe thousands of little topping cuts. So we haven’t don’t our natural target pruning, we’ve just cut kind of any old place. I’m assuming that this is the dormant season although this could have just been pruned to death. We don’t know that for sure. This is an example of maybe what we want to avoid and what we want to encourage our clients to avoid when they come in asking for advice about pruning. I hope that this picture really brings home the point that shearing is not the way to go. I know that there are a lot of people out there who appreciate a well sheared hedge. I think that a natural looking plant is much more pleasing then one that’s sheared, and it’s healthier.

**Slide 47**

Well, let’s talk about some pruning strategies that are unique to shrubs. First of all the species of shrub makes a difference. So you have to know what type of shrub you’re dealing with. Is it an evergreen or is it deciduous? That might make a difference as far as when you would want to prune it. When does it flower? That might also make a
difference. And what is the growth habit? What kind of grower is the shrub, is it one that sort of resembles a small tree? If it a groundcover? Is it what we call a cane grower? All of these things kind of inform our decisions about the pruning cuts we’re about to make.

Slide 48

So this is an easy one. How do we protect the flowers? And I went over this earlier when we were talking about trees, but if our main objective is to prune to protect the flowers, then again we want to prune spring-flowering shrubs after they finish flowering because they bloom on growth from the previous year. Summer-flowering blooms on this year’s growth or the new growth, so you can prune it in the dormant season.

Slide 49

One of the questions that we get, or that we get a lot from visitors to our Master Gardener clinic, is questions about timing. When should I prune my spring blooming or my summer blooming shrubs? This is a bridal veil spirea, and as you can see it’s just finished blooming. It blooms early in the spring or actually mid-spring this year with our weather. You can prune it just about any time, but in order to preserve the blooms you want to wait until after it’s finished blooming and then do your pruning work. This is a shrub that blooms on old wood and most of our spring blooming shrubs bloom on what grew the year before. So spirea or lilacs, those shrubs all bloom on last year’s wood. So in order to preserve the bloom, which is part of the reason of having a blooming shrub, we wait until after it’s done and then we can make our cuts afterwards. On the other hand or by contrast, we have a summer blooming spirea. This is Bumalda-type spirea. This one blooms on wood that grew this year. So this is all new growth this year, and we can prune this any time. The best time is probably the dormant season. But we can prune this any time. I could prune this now, I would be sacrificing blooms. But any time up until it breaks bud and starts to grow in the spring and we’re not sacrificing our buds. So summer-blooming shrubs you can prune in the dormant season or after they finish blooming in the summer. And spring-blooming shrubs, prune in the summer after they have finished blooming.

Slide 50

Evergreens, and by that I mean conifers, are best pruned in late winter to early spring. So you want to prune them in the dormant season, but you also want to prune before they break bud. The reason for this is that evergreens, and this includes conifers and broadleaves like rhododendrons, they continue to lose water through their leaves all during the winter. When the ground is frozen they don’t have a way of replenishing that water and so they’re much more prone to desiccation. If you’re pruning these, especially when it’s very cold, when the soil is frozen and they can’t replenish that water, you’re creating these wounds that they can’t seal off fast enough. So they’re losing water even more then they were before, and that creates a situation where desiccation is even more likely. Also if you’re doing a lot of pruning with a conifer or a broadleaf you’re potentially opening up the canopy of the shrub to elements of the weather like cold, snow, and ice that the interior of the shrub hasn’t really had to deal with before. It’s been protected for a long time by what used to be out there. So if you do a lot of pruning on an evergreen and really open it up you want to do it at a time when it’s less likely to
face really cold temperatures or a big snow storm or an ice storm. So do that in the late winter or early spring. But do it before the buds break and the tree will be healthier in the long run. Excuse me, the shrub will be healthier in the long run. OK so you also want to take into account when you’re dealing with conifers especially, a lot of them don’t resprout from bare wood. In other words, if you cut past the green tissue and completely remove that on a branch, they won’t regrow from the bare or brown woody tissue. Now that’s not always the case. Some of them will regrow from that branch, from that bare wood, but it’s almost always much slower and you’re left with a hole in the canopy or a bare branch for a long period of time, so think about that when you’re pruning these, try not to take so much that you’re taking all the green tissue off of a branch.

**Slide 51**

Well, here’s an example of a conifer. This is a mugo pine, a shrub favored by parking lots everywhere. And actually these are wonderful, very hardy shrubs. A mugo pine, the shape here is roughly globe-shaped. There are different ways to prune this without having to shear it. One of the ways is to prune the branches back, the ones that stick out too far just to maintain a smaller or rounder shape. If it is growing out where you don’t want it to grow, maybe interfering with another shrub or growing over a curb, it is fairly easy to prune these stems back to a side branch. If you are interested in trying to keep a conifer plant very small, look down in the lower right hand corner and you can see we have made this cut, we have done what is called candle pruning. And the candle is the part of the conifer, it’s where the new bud is starting to grow the new growth for the year. We call those candles because they look a little bit like small candles. You can actually prune these candles off or you can prune them halfway off as they are starting to expand, that way you have a much slower growth. You keep the plant nice and compact. And a lot of times with these mugo pines people want to keep them fairly small and dense, they don’t want a lot of leggy growth. So candle pruning on these ones can really give you the desired effect. Now you can do this with just about any evergreen, it is easiest with those in the pine genus because the candles are much more obvious with those. It is hard to prune an expanding spruce bud because they are very small. But with pines it is much easier and creates a very small pruning wound, much smaller than say, cutting a whole branch off.

**Slide 52**

All right, we’re going to talk a second about thinning cuts. This is, as you can see, a very large shrub. This is a mugo pine and what we’re going to do here is we’re going to try to thin out the canopy of this without resorting to shears and trying to shear this into a little ball. Thinning cuts are better for the tree or the shrub because it allows air circulation to pass through so it reduces fungal diseases that very often appear with shrubs that have been sheared. So if I was going to do some thinning cuts here I would take some of the branches that are fairly congested like this. Because this is a conifer I am just doing some candle pruning, I’m just cutting these candles. They’ll seal off these wounds fairly quickly and I am going to thin this out. I can still reduce the size of it overall by picking the taller candles that are growing but at the same time I can increase the air circulation and not have to sacrifice the health of the shrub for the look that I
want. This also in the end gives us a much more natural-looking plant because we’ve all seen plenty of round little balls and squares and columns. We should let the plants look like what they look like.

**Slide 53**

Let’s talk for a minute about broadleaf evergreens and by that we’re referring to rhododendrons, azaleas, cherry laurels, Kalmia, which is also called mountain laurel, Oregon grape, and of course dozens and dozens more. These usually don’t require much pruning and I guess that’s a bias I have coming from the east side of the state where most of the time we are just desperately trying to keep our broadleaf evergreens alive. But even on the west side they don’t always need a tremendous amount of pruning, at least not the way some of the other shrubs do. To prune these you generally think of them in the way you would a tree. So you prune to a side shoot or a lateral that is at least fifty percent the diameter of the branch that you are cutting. If you need to do a severe pruning, if you are really trying to reduce the size of one of these plants, early spring is really the best time for that because you can do your severe pruning and then they will put on some growth after that to kind of cover up all of the pruning that you have done. And also they will start recovering, they will start growing again. If you are just doing a smaller pruning job you can wait until after they finish flowering in the spring, most of these are spring flowering. You can wait until the bloom is finished and then you can do your pruning there, if you are just pruning a few branches here and there that way you are not sacrificing the bloom. Of course if there’s dead wood in these, just like with any tree or shrub anytime is the right time to remove deadwood as long as you are using your natural target pruning and getting that stuff out of there, anytime is the right time.

**Slide 54**

All right, so when we are talking about shrubs overall and we are talking about deciduous or evergreen here, what kind of growth habit are we talking about, because the growth habit forms some of the pruning decisions that we make. So is it a single stem shrub or does it maybe just have a few trunks that are all basically growing from one point? Is it what we call a cane grower, in other words many stems are coming straight out of the ground and maybe these spread over time and so that they take up a very large area? Is this a groundcover-type shrub? So maybe it comes out of a single stem or a few stems but it spreads out from one point, but it always stays very low to the ground. So think about the growth habit when you are deciding how to prune.

**Slide 55**

Single stem shrubs, most of the evergreens would be included in this, and you could also include the burning bush even though they don’t always come from a single trunk, contorted filbert and there are thousands of them. All of these are ones you might prune as if they are really small trees. So you make smaller cuts in the canopy, you don’t generally cut these to the ground, in fact most of the time you don’t want to cut these to the ground like you might some of the other types. So think about it as a small tree and make small cuts in the canopy. You can make some directional pruning cuts, so if it’s growing in a way that you don’t want, you can alter it by cutting off a few branches and
kind of shaping it in another direction. Again, remove those crossing and rubbing branches, if it is too dense in the center and some shrubs just do that, you can prune out some of the internal branches just to get a little bit more airflow though there and reduce the chances of disease. In general you want to prune these during the dormant season; that’s not always the case but that seems to be a rule that works well for these.

**Slide 56**

Cane-growing shrubs are ones where multiple stems will come right out of the ground. Some examples of that: barberry, ninebark is a native plant, redtwig dogwood, mock orange, lilac, quince, forsythia and really hundreds and hundreds more. These are the ones you can prune the most aggressively, as opposed to say the groundcovers or the tree-like shrubs or the single stem scrubs. In fact they can be pruned pretty aggressively and thrive, some plants like lilacs in particular actually bloom better if they are pruned fairly aggressively. Of course they need to be established first before you do any big pruning, so let them stay in the ground for at least three years before you plan to do anything major. Now these established plants can actually often times be pruned straight to the ground, and this is called rejuvenation pruning. I’ll show you what I mean by that in just a little bit. Generally you start by cutting the oldest stems; those are the ones that don’t bloom as well in most cases. Sometimes they’re ones that get too tall or maybe they are the ones that are diseased. Of course, cutting the diseased ones out is going to help the plant as a whole. But with these, if you cut the oldest stems generally it kind of gives a freshening look to the shrub and also has the health benefits.

**Slide 57**

OK, well, let’s just kind of go through an example here of pruning this, this is a Vanhoutte Spirea, common name is bridal veil spirea. There are several different species that are called bridal veil but this is one of those that blooms in the early spring with white flowers, very pretty and planted in a lot of places because it is just a very disease resistant shrub that adapts to a lot of different conditions. But this one has done so well it’s actually a little bit overgrown. You can see it’s planted by a pool and it’s just kind of outgrowing its space. Also it looks like it’s fairly dense in the middle and I bet that this is probably is troubled by aphids in the spring, there is a lot of dense growth in the middle. So what we can do is just kind of take out some of that older wood that might be more prone to insects or disease. We’ll maintain its overall shape and appearance, but we are just going to kind of freshen it up, for lack for a more technical term. So let me just start by identify identifying some of the younger canes that we want to keep when we prune this shrub. These are all fairly small canes at this point, but they still have the flower blooms for this spring because this is a spring-blooming shrub. It’s already set flower buds for this year; we don’t want to remove all of the flowers if we can help it. But we do want to reduce maybe the size of this a little bit and just kind of eliminate some of that older growth that’s not doing as well. So here are the branches that just looking at this shrub we want to maybe keep those if we can. And just look at those yellow bars right now, we’re still keeping the shape of this plant, we’re keeping a natural shape to it but we are just going to kind of remove some of that older growth.
Well, here’s an unfortunately blurry picture of the center of that. And you can see it is fairly well congested. We’ve got a lot of growth and it looks like we’ve been pruning in there before. So that’s where we’re going to look to do a lot of our pruning. We’re going to prune right to the ground or a little bit above the ground and we’re going to remove some of that older growth that isn’t as vigorous, isn’t as healthy, while maintaining the natural look of the shrub.

This is what it looks like when we’re all done. So we’ve actually done quite a bit and as you can see looking at the bottom, we’ve cut some fairly big in diameter canes out of the center of this shrub. But if you look at this, we still have the same basic shape to the plant and we’ve left a lot of the new healthy tissue, the newer canes that are still going to bloom. So we’ve maintained our floral display for the spring. We’ve cleared out a lot of that less vigorous and dead or possibly diseased wood that was in the middle. So overall we’ve just kind of given this a new appearance. We’ve given the appearance of a younger, healthier plant, which, in many ways, it is.

Let’s talk for a minute about renovation pruning. Looking at this shrub, you can see that this is huge. Even in the dormant season you see that it’s got dozens and dozens of canes coming up from the ground and sometimes you just don’t know where to go with this kind of a shrub. Now we have a couple of different choices. One of them is to preserve the shape of the shrub. We can find a branch like this and we can just cut back from the edge as far back as we want to. So we might choose this nice healthy branch to cut back to right there, and we can keep cutting back from the tip on all of these branches. That’s OK for some shrubs. Sometimes they’re just too big to do that, and then we get into what is called renovation pruning.

When you do renovation pruning you’re actually going to go inside the shrub. As you can see this is quite a mess in here, but you’re going to get inside here and you’re going to start looking for the oldest, the biggest, usually the oldest canes are the ones you start with. And you’re going to prune those all the way to the ground. That means all the way back and you’re going to pick up about a third of the shrub and take all the canes out. It’s something that is a little bit daunting if you’ve never done it before. But this will stimulate a lot of new growth and the new growth that comes is going to fill in at the bottom where you can see we have not much good foliage.

OK so we were talking about renovation pruning. Going in here we’d probably pick about a third of these canes out, and we would cut them all the way down to the base. So if I was choosing this one, and this is a likely candidate, a bigger and older cane coming out of the ground, we might cut this all the way down to the ground and then pick a few others in here just to thin out all the growth that’s in here. And also to stimulate new growth to come from the base. New growth, as you can see right here, is coming right of the ground. So we’ll get lots of vigorous new shoots coming up once we start this renovation pruning. In some cases, you might make the decision to cut this
whole thing, the entire shrub, down to the ground to about 6 inches above the ground. That’s a hard sell for some people. They see their whole shrub disappearing and they’re not sure it’ll come back. But on a well established healthy shrub, like this one, we could literally cut this down to the ground and by next year it would be up and have lots of new growth. It wouldn’t bloom next year, but it would still have lots of healthy new growth and we’d have a more manageable size shrub. Renovation pruning is something you would choose when a shrub is like this one, when it’s very old, overgrown, has a lot of crossing and rubbing branches and just looks like it’s kind of a mess, it’s time to give it a fresh start or clean slate. It’s one that you want to save for nice healthy shrubs, if it’s diseased it may not come back well but renovation pruning is something that works really well to make an old shrub that’s too large look young and healthy again.

**Slide 61**

Well, let’s do another example of pruning a cane growing or cane type of shrub. This is Oregon grape and as you can see in this picture it’s really need through the wringer. You have a lot of dead tips at the top. Looking at the picture in the lower right you can see a lot of brown leaves especially at the end of the leaves that indicates some winter burn, some cold damage to this shrub. Overall it just doesn’t look good. It doesn’t look healthy either. We have a lot of bare twigs that are showing. So in this case, we have a really well established shrub and it’s a cane growing type so we’re going to do what’s called renovation pruning on this one.

**Slide 62**

Wow! That was easy. So in renovation pruning, you’re literally taking away almost everything that’s aboveground with the shrub. So we’ve left these trunks that are about 6 to 8 inches tall. Now these are topping cuts in that they are not cut down to a side branch, but with cane growing shrubs you can actually get away with this and get good re-growth. Not only from these trunks, but also from the root system, so new canes coming directly from the ground. This kind of renovation pruning isn’t something you would do all the time, but on an older shrub that’s really overgrown and not that healthy, this might be just the thing to start it over and get you some good fresh growth and make the shrub look new again.

**Slide 63**

Well, the last of the shrub growth habits that we’ll cover today is the ground cover habit and those are the shrubs that generally grow out of the ground at a single point, a single trunk or maybe a couple of trunks, and radiate out from that point. Sometimes they will root at the nodes and that’s kind of how they spread and go on, but in general they start at one point and grow out from there. Examples include the groundcover junipers, cotoneasters, some of the Hypericums are like this, and generally with these you just remove the dead wood, so completely remove all of that. Thin them as necessary because they do tend to grow up and over each other, so you can keep them healthier by thinning them out a little bit. And what you want to avoid with these is shearing. Now I advocate not shearing any shrub but with these in particular usually their leaf canopy is fairly thin. So by shearing them you’re taking something thin and making it even thinner. There’s really not a way to shear these and make them look attractive, even for
a short period of time. So avoid shearing these. But what we do advocate, what might work best, is what’s called shingle cutting. Shingle cutting is where you cut the branches are that closer to the main stem. You cut those fairly short, and then the branches that are out a little bit further from the main stem you cut them a little bit longer. It’s similar to the appearance of the shingles on a house. In other words, the main stem where the plant comes out of the ground those branches will be a little bit taller, but they’ll also be cut fairly short, they won’t radiate out as far as some of the lower branches. The lower branches will radiate out farther, and you leave those growing a little bit longer so that you are really just cutting in the same pattern as the shingles on a house. That shingle cutting helps to them a somewhat managed appearance and it also by doing this regularly, say every year or two, it also keeps them from being overgrown, keeps the canopy fairly open so that you get more air circulation, less chance to get diseases or insects.

Slide 64

Here is an example of a ground cover type shrub, this is Kinnikinnick, and these plants will often root at the node where leaves are, but generally they come out from a single point in the ground and here we would just pick some of the branches that were up higher and we would prune those fairly hard, prune those back closer to where they came out of the ground. The ones that are lower, we’d let those grown a little bit longer. So overall we’d have a more manicured appearance rather than the kind of unkempt, fairly congested appearance that you see here in this picture. These ones can be just pruned back from the tip, in other words if they grow say to the edge of a curb or the border of the bed where they are planted, you can just keep pruning them back there. That works, but over time you tend to get more dieback on the lower branches and the chances of diseases of appearing are a little greater because the tissue is so congested or the canopy is so congested that there isn’t good air circulation.

Slide 65

Well, way back a couple of day ago when I first started talking, I told you this was going to be an introduction to pruning trees and shrubs, and boy, it was a pretty long introduction, wasn’t it? But I wanted to make sure we got some of the more important points across. If you want to learn more, and I hope you do want to learn more, here are some books I’ve found that are really instructive. They really helped me to become a better pruner, a better arborist. Cass Turnbull, a lot of people on the west side of the state are familiar with her work and the group Plant Amnesty have a great website. But this book is a really great guide from pruning, especially in the northwest. A lot of the shrubs and trees that she talks about in her book, mostly shrubs, are ones that we see regularly. So that’s a great book to get. An Illustrated Guide to Pruning by Ed Gilman is, if you’re going to buy just one book on pruning, this might be the one that I would recommend. It does talk a little bit more in terms of pruning trees, but there are shrubs included in there as well and he has taken all of the things that I’ve talked about and really spelled them out with great pictures and photos in them that really illustrate the point. So if you’re interested in learning more, I recommend that book. And also The American Horticulture Society Pruning and Training. This is a plant by plant manual, an excellent book; it has a lot of pictures. If you’re interested in a lot of the types of pruning that I told you not to be interested in, this book tells you how to do those; say pleaching,
coppicing, and some of those, pollarding. Those are not great for plant health, but they are traditional forms of pruning. So if you must learn more about them, at least learn about the correct way to do them, if there is such a thing, and this books your that as well as some more, let's say enlightened types of pruning. Great pictures in this good and all of these are ones that would help you develop as a pruner.

**Slide 66**

Thanks for listening to this presentation. Here’s some of the places I got my information that I presented in this PowerPoint. All of these, again, are great sources for me. I want to thank in particular Lisa Hill and Ray Maleike, who I borrowed pictured from that appeared in this presentation. Thank you again and happy pruning.