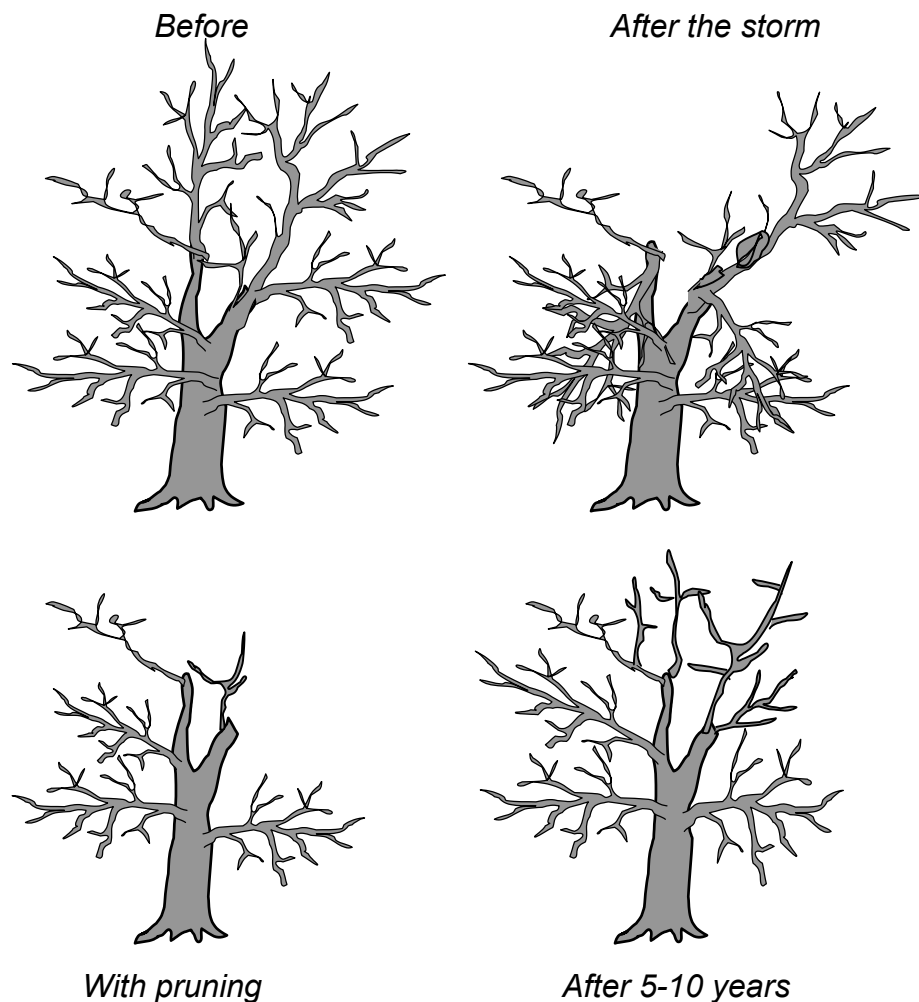


## After the Storm: Caring for Your Trees

Windstorms and ice/snow-storms strong enough to tear limbs off trees can be a problem across Montana. Cottonwoods, poplars, willows, green ash and Chinese or Siberian elms are particularly susceptible to this problem because they have soft and brittle wood. With high enough wind speeds or heavy snow loads, no tree species are risk free. The tremendous leverage that wind and snow exerts on tree limbs causes various types of damage which typically include broken tops out of conifers such as spruces and pines to torn and twisted limbs on deciduous trees. This type of damage rarely heals well by itself, which makes immediate pruning essential if the tree is to be saved and allowed to regain its former beauty (Figure 1).

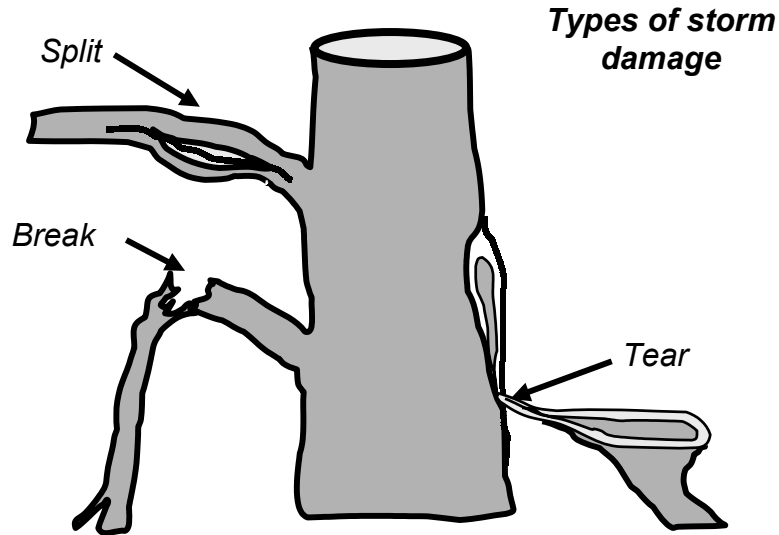


**Figure 1**

### **Type of damage**

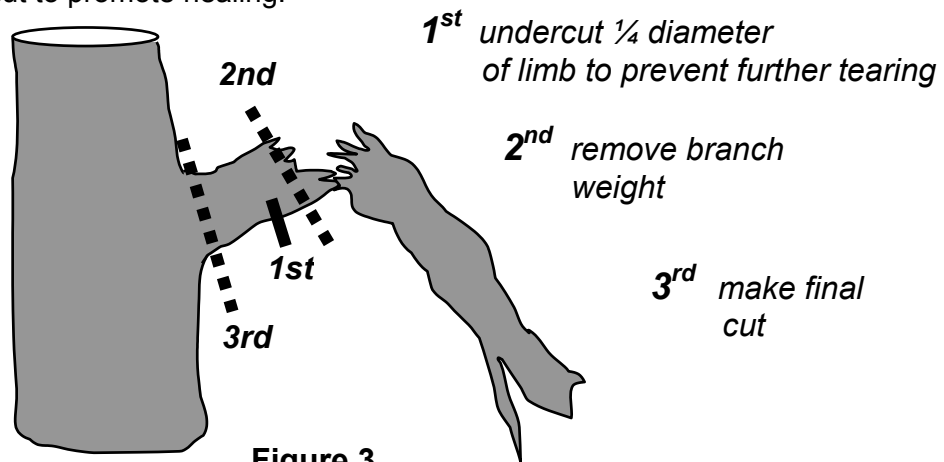
In each case it is important to properly treat the different types of mechanical damage a storm can cause to give the tree a chance to properly recover. The first goal of pruning injured branches is to minimize the amount of woody tissue exposed to the air. Open wood is an invitation to pests and pathogens to enter the tree and further

damage it. Injuries caused by twisted and broken branches need to be trimmed in such a way that the tree is able to heal over the wound as quickly as possible. Typical types of injuries are diagrammed in Figure 2.



**Figure 2**

The jagged injury created by a broken branch will heal very slowly since new bark has to grow over the injured area from the surrounding healthy bark. Any kind of irregular surface will act as a barrier to this new bark growth (called a callous). A smooth surface made by a proper saw cut will allow bark to cover the exposed wound much more quickly. It is equally important to prune branches back to an area of healthy tissue that will remain alive. If a break occurs near the main tree stem or close to a larger branch, the broken branch should first be removed to reduce the weight and leverage on the healthy wood. Next, the branch should be trimmed back close to the main stem at a slight outward angle as shown in Figure 3 to ensure that enough healthy tissue surrounds the cut to promote healing.

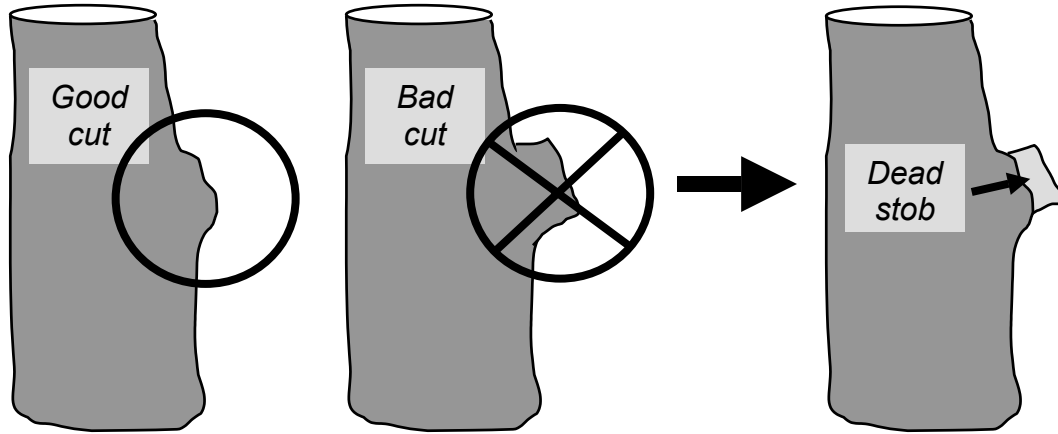


**Figure 3**

Under no circumstances should a short section of branch be left on either a branch or along the main stem that is long enough to "hang a coat on". Poor cuts will

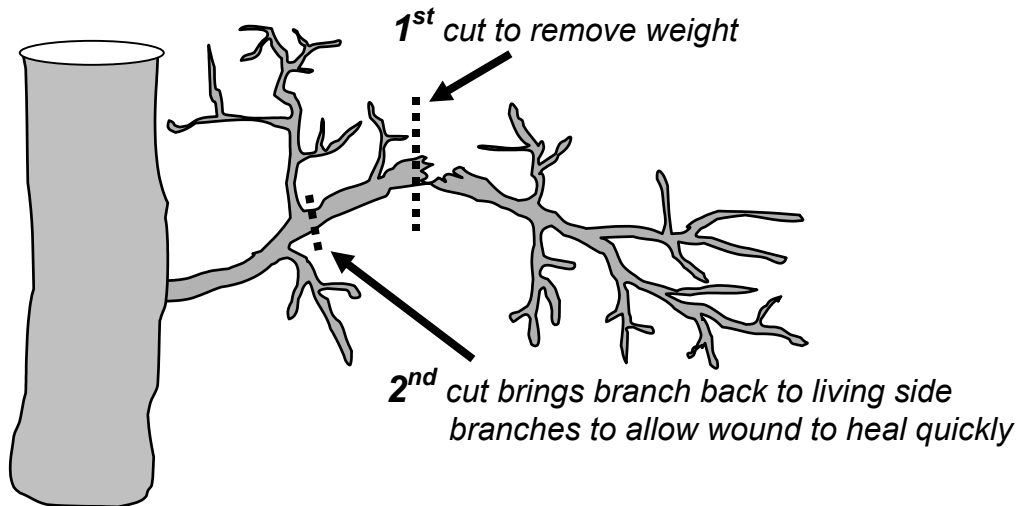
result in a dead “stob” protruding out of the side of the branch or stem that will die off allowing decay fungi and insects to attack the woody tissue inside the tree.

*Avoid leaving “coat hangers”*



**Figure 4**

If a break occurs far enough along a branch so that healthy branches with leaves or needles exist between the break and the main stem, it is possible to leave the healthy portion of the branch intact. The branch should be pruned back to where the healthy secondary branches protrude (Figure 5).



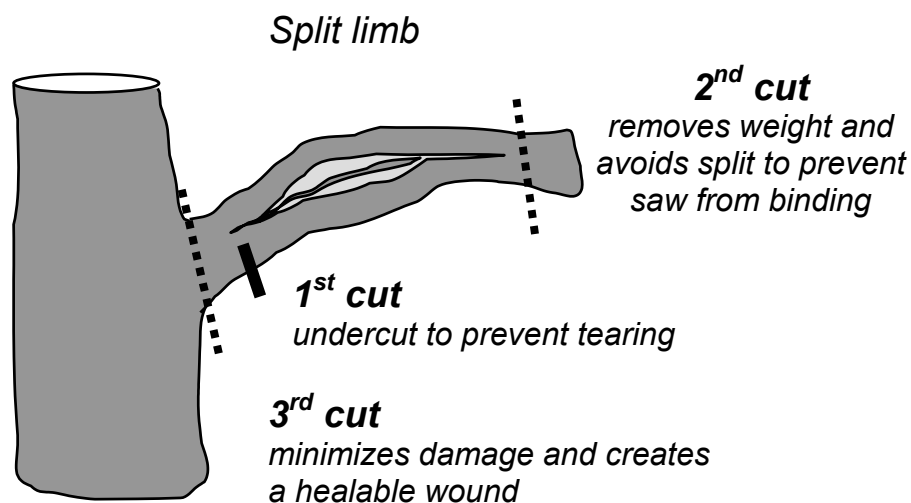
**Figure 5**

Another type of injury is referred to as a “split” limb (see Figure 2). This is caused by a twisting motion. Severe splits will cause the rest of the branch to eventually die and also create a hazard to anyone or anything under the branch. Some splits have a good chance to heal. To help diagnose if this type of injury will warrant the removal of the branch, consider the following:

- 1) Is the twisted limb in a place on the tree where its removal will severely affect the shape of the tree? If not, it may be best to remove the branch.

- 2) Does the branch flop around in the wind or does it appear to be fairly secure? As the branch moves in the wind does the split open and close? If the branch seems fairly secure and the split does not flex noticeably the branch will more than likely recover.
- 3) Is the branch greater than 4 inches in diameter? If so, there is considerable weight on the branch and the split represents a dangerous structural hazard that can result in the branch breaking off unexpectedly.
- 4) Does the split result in an open gap greater than ½ inch wide? Splits larger than this rarely heal, and the opening will eventually allow wood decay fungi to enter the branch and further weaken it.
- 5) Finally, if there is no immediate danger of the branch falling off in a heavily traveled area, wait and see if the branch recovers – this should only apply to a branch that is split but has not changed its structural position much (not hanging crooked).

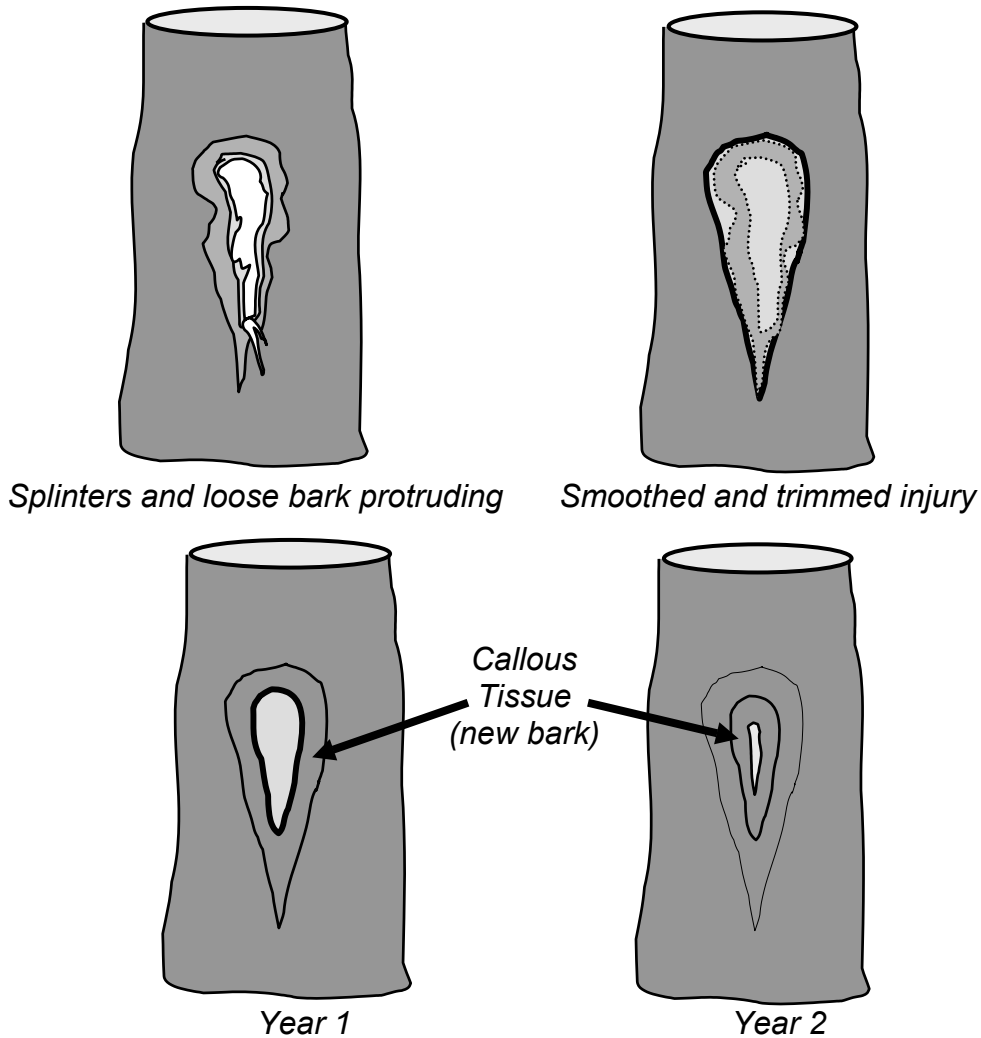
When removing a split limb, it is important to follow the proper cutting procedure (Figure 6). Since the limb is already split, improper cutting can cause the split to enlarge and potentially cause much more serious damage to the tree. Also, cutting directly through split will often bind your saw creating a dangerous situation.



**Figure 6**

The final type of injury is created when the torque of the wind causes a branch to be torn out of the main stem of a tree or from a larger branch. This usually creates a large gaping injury where a strip of bark has been pulled away from the remaining tree along with the branch. Although there is little that can be done to “fix” this type of injury, proper treatment can help this injury heal more quickly. Much like a broken branch, the remaining living bark will slowly grow over the injured area. The smoother the exposed woody tissue, the faster the new bark will grow over it. Using a sharp wood chisel or saw where necessary, trim off any wood splinters protruding from the injury. Likewise, any bark that has been pulled loose from the stem will die, therefore, trim loose bark back to where it connects with the solid wood of the stem. Caution must be used when doing this to avoid creating larger injury! Since water from the roots and sugars from the leaves travel in an upward/downward direction, try to shape the injury into a teardrop or elliptical shape (see Figure 7). Although the use of pruning paint has not been shown to

affect the healing process, it may be applied to injuries such as this to lessen the visual impact and potentially reduce air damage to the living tissue under the injury. Only use properly designated pruning paint. Any petroleum based product such as roofing tar or oil paint will damage the surrounding living tissue and create a much larger injury!



**Figure 7**

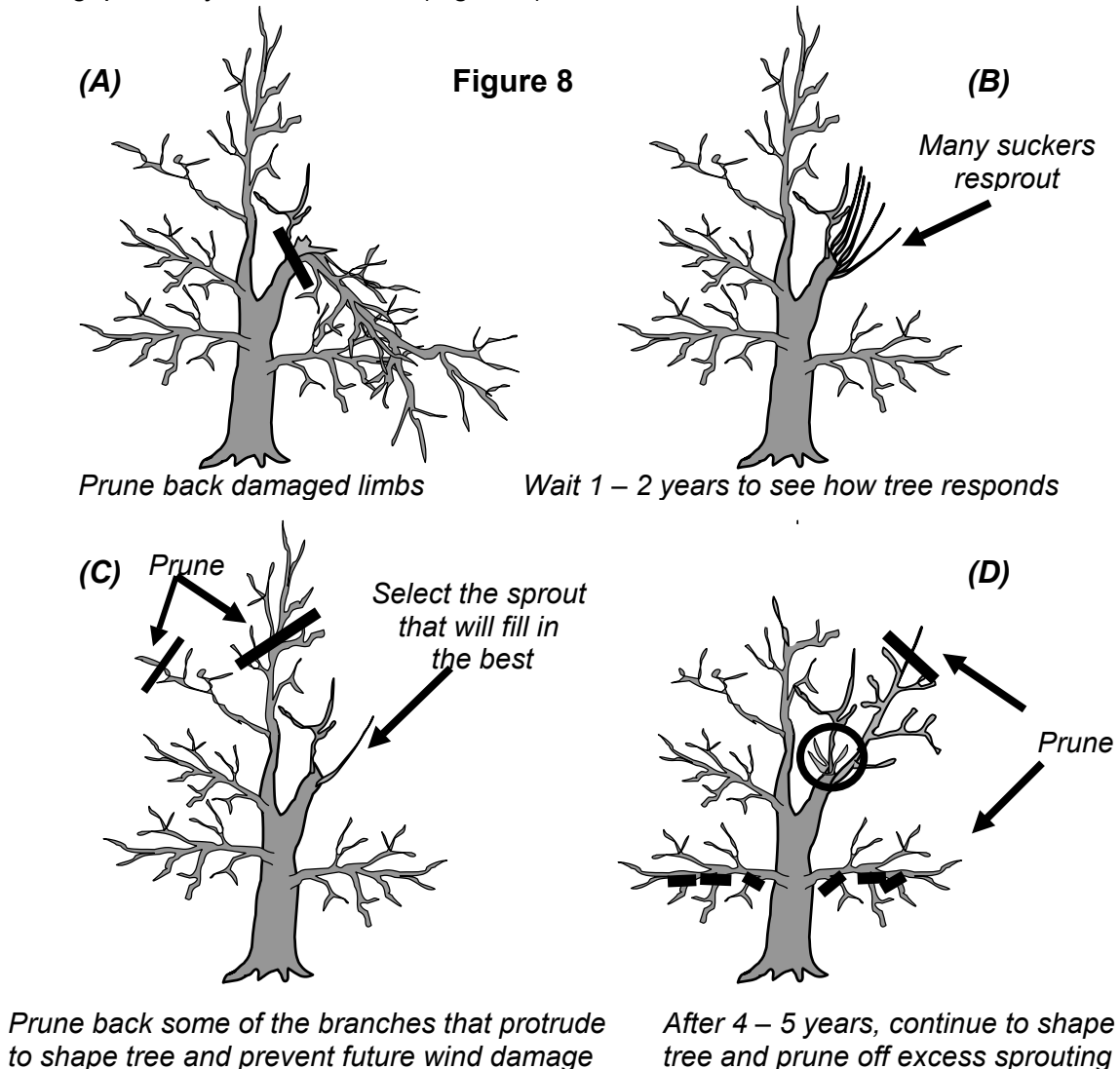
Occasionally, a tear will create a deep depression in the wood which will hinder good callous formation across the injury. A concrete packing is sometimes used to create a smooth surface to enhance the healing process. The concrete is mixed on the dry side so it is not runny, next it is tightly packed into the depression so that the outside layer is flush with the barkless wood. A damp rag is then used to polish the concrete to make a smooth surface. The resulting packing should create a profile that looks exactly like the stem of the tree with the bark removed. This last part is critical because a protruding concrete packing will create just as large a barrier to new bark formation as the original depression. The final step is to record where you put the packing so that any future tree trimmer will not hit the concrete with a saw (which can be very dangerous with a chainsaw).

## How much injury can a tree survive?

### Deciduous trees

Sometimes trees are injured to such an extent that tree removal and replacement are the best options. Making such a decision should be based upon the tree species involved and what the tree owner desires. Some tree species such as willows, cottonwoods, green ash, and Siberian or Chinese elms can virtually grow new branches from a stump. The advantages of such a situation are that you will have a tree (of sorts) back fairly quickly. The disadvantage is that the tree will more than likely develop serious internal wood decay that will structurally weaken the tree if it allowed to get too big.

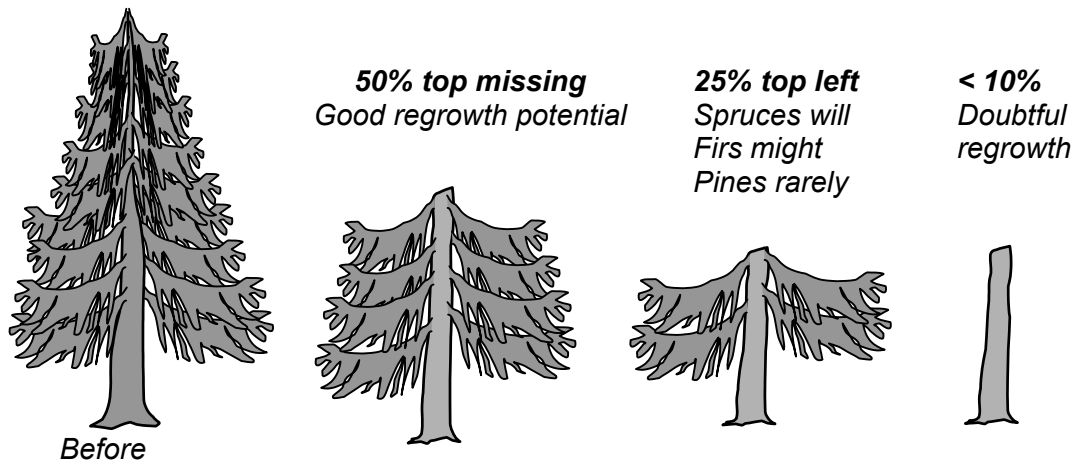
Although resprouting often appears, there is no prediction of how vigorously this will occur. In such circumstances it may be best to prune back broken limbs and trim wounds as best as possible, then wait for one year to see what type of regrowth occurs. Where sprouting occurs on branches that have been broken off, selective pruning after one year should be used to allow a few select sprouts to develop into branches that will fill the gaps left by removed limbs (Figure 8).



New sprouts (also called epicormic branching) develop from dormant buds within the tree bark. As a result they are initially not anchored to the actual wood of the tree. Sprouts tend to grow very rapidly and can become a hazard since they are not attached very securely. Reforming a tree crown from such sprouts should be done with a regular pruning plan to decrease the length of these new branches until wood formation at the branch attachment to the stem takes place. This usually takes at least 4 years. To keep a pleasant shape to the tree, other undamaged branches can also be pruned back resulting in a more compact crown, which is also a bit more wind resistant in the long term. When pruning any tree, especially storm damaged trees, it is important to leave enough foliage to maintain overall tree vigor. The best approach is to: (1) properly trim back injured limbs; (2) wait a year for new sprouts to appear, (3) selectively prune back sprouts and start shaping the tree; (4) after a couple more years re-prune sprouts and further shape the tree; (5) evaluate past wounds to ensure they are healing properly and that limbs supporting new growth are not starting to decay creating a structurally unsound and hazardous branch.

## Conifers

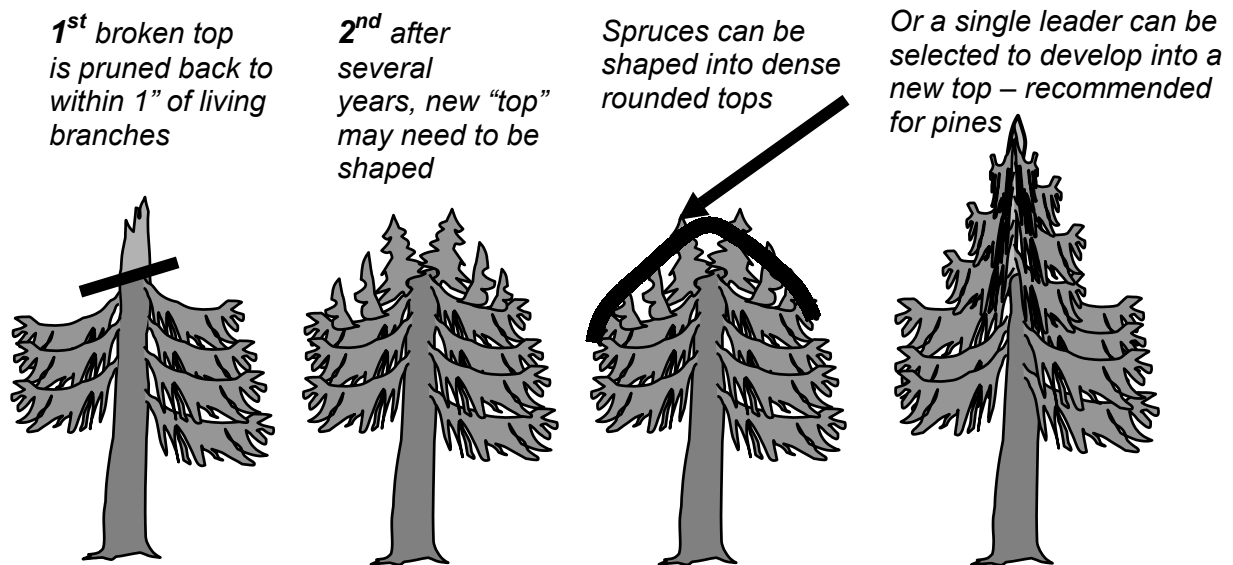
Evergreen trees need to be pruned slightly differently than broadleaf trees. Typically a conifer will have one main stem with whorls of lateral branches evenly spaced along the stem. Lateral branches do not resprout as well as most hardwoods, although there is some variation among species. Spruces, and firs may produce some weak new lateral branches, whereas pines will rarely grow new lateral branches. All conifers will produce new leaders (tree tops) if they have enough lateral branches left to support such growth. Typically a conifer that has lost all of its branches will die (see Figure 9).



**Figure 9**

Conifers that have lost their tops to a wind storm should have their main stem trimmed back to within an inch or two of healthy lateral branches. The final cut should be made at a slight ( $10^\circ$ ) angle to allow water to run off, especially after new callous growth forms a ridge around the edge. Typically, several new leaders will start to form from the lateral branches nearest the top (Figure 10). If left unchecked, the tree will develop multiple tops which over time will create a tree very prone to further wind

damage. Several options are available depending on the type of tree and maintenance the tree owner desires. Multiple tops on spruces will not hurt the tree if these tops are pruned on an annual basis keeping the tree short and rounded much like a hedge. If the desire is to let the tree get tall again, it is highly recommended that the strongest new leader be selected that is closest to the original stem. Eventually it will be difficult to see where the tree was broken except a small crook where the new leader took over. This procedure is recommended for pine trees as in most cases they do not respond well to annual pruning. Fir trees are somewhat intermediate between spruces and pines in their response to pruning.



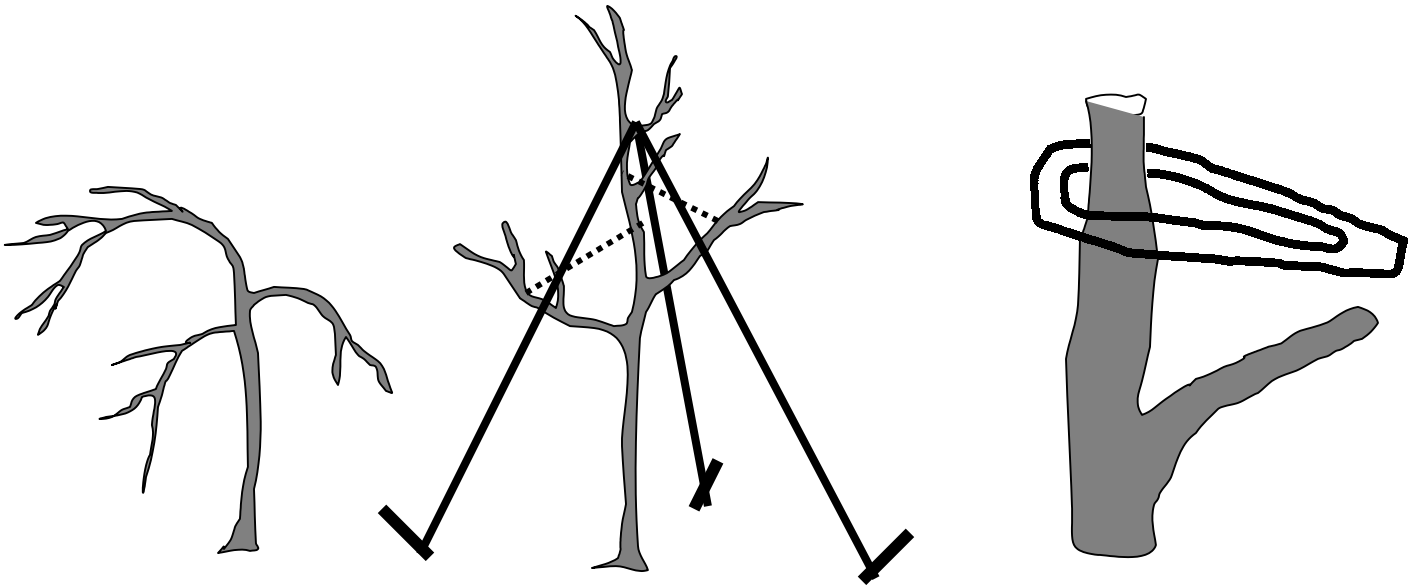
**Figure 10**

### **Leaning trees**

Occasionally storms will cause some trees to lean. This usually occurs in the spring when stems and branches are already heavy with water and the additional stress from wind, snow or ice causes the wood fibers to bend rather than break. Some trees will recover their former stature naturally, however, many will not without assistance. Some natural recovery will occur within days following the damage, and with some species straightening will happen during the entire growing season. Typically trees with a stem diameter greater than 3 inches will not naturally straighten themselves. In any case, using support lines to straighten a tree as soon as possible helps the situation because the longer a tree remains bent-over, the more difficult it will be for the tree to recover it's original shape. With increasing time bent wood fibers will harden and retain their curved shape. In addition, the larger the diameter of the stem that is bent, the more difficult it will be for the tree to straighten up. Often selectively pruning back the tips of bent over branches will help reduce the leverage of the branch or tree allowing for greater straightening.

When attaching support lines to a limb or tree trunk it is critical that the portion of the support that wraps around the tree is cushioned with rubber hose, inner-tube, foam or some other substance that distributes the pressure. Particularly in the spring and early summer, tree bark is very soft and easily injured by pressure. Guide lines should





**Figure 11**

be left in place for 1-year and then removed. Leaving them in place too long will result in the tree relying on the support for strength rather than growing new woody fibers.

### **Summary**

Since it takes a relatively long time to grow a large tree, it is usually desirable to do everything reasonable to try and save a storm-damaged tree. With proper pruning, some time, and continued care, it is amazing how well some trees can recover. When in doubt – give the tree some time. The first concern, however, should be to avoid creating a hazard. Every tree has the potential of dropping limbs or falling on someone or something. A healthy, properly pruned, and structurally sound tree minimizes that risk. A poorly pruned tree, or one that has not recovered well from a severe injury (hollow and rotten stems and limbs) maximizes that risk. Other than pruning, giving trees supplemental watering during very hot and dry summer weather (a slow trickle of water for 8 hours at night once every other week) and a weak well balanced fertilizer (such as 10-10-10) in the spring will help trees recover.

Pruning large trees can be quite dangerous. Using a chainsaw with proper footing has inherent risks, using a chainsaw in a tree should only be done by a trained arborist skilled in the use of safety ropes and/or with a hydraulic bucket (cherry picker). A good arborist may also be to help save a tree and minimize hazardous situations by using other techniques such as cabling, repairing decayed cavities, using deep fertilization and applying proper pest control methods.