

Urban Forest  
Management Plan

Stewart Indian School

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## Introduction

The Nevada Division of Forestry (NDF) has prepared this report for the Stewart Indian School. The report grew from a request in 1999 by Ms. Sheila Abbe, director of the Stewart Indian School Museum, for assistance with trees surrounding the museum. After visiting with Ms. Abbe, NDF staff decided that the entire school grounds would benefit from an evaluation and a management plan. Meetings were held with Nevada State Buildings and Grounds personnel, and work began on the plan.

The survey was conducted from February through September, 2000. Generally, all trees evaluated were located within the interior of the property, rather than on the periphery. Trees located near out buildings were also inspected. Trees were examined for species and condition. No measurements of diameter, height or crown spread were made unless the tree was a "big tree" candidate. There are few recommendations to prune specific trees because most of the trees on the property have dead branches which should be removed. The absence of such tree specific recommendations does not mean that a particular tree lacks dead branches. Trees located near potential targets should be carefully evaluated for dead branches. Where an entire tree poses an unacceptable hazard and risk, specific recommendations for tree removal are made. It is important to note that the level of tree inspection employed in this survey is inadequate to detect all possible defects causing hazardous trees. No root or root crown investigations were conducted, and except where noted, no coring for internal defect was done. Additionally, all observations were made from the ground. More detail tree examinations should be conducted by a certified arborist. All tree maintenance activities should follow ANSI Standards A300-1995 and Z133.1-1994 (see Appendix A). All pruning should follow Natural Target Pruning guidelines (see Appendix B). Some of the recommended work may have already been completed prior to finalizing this report.

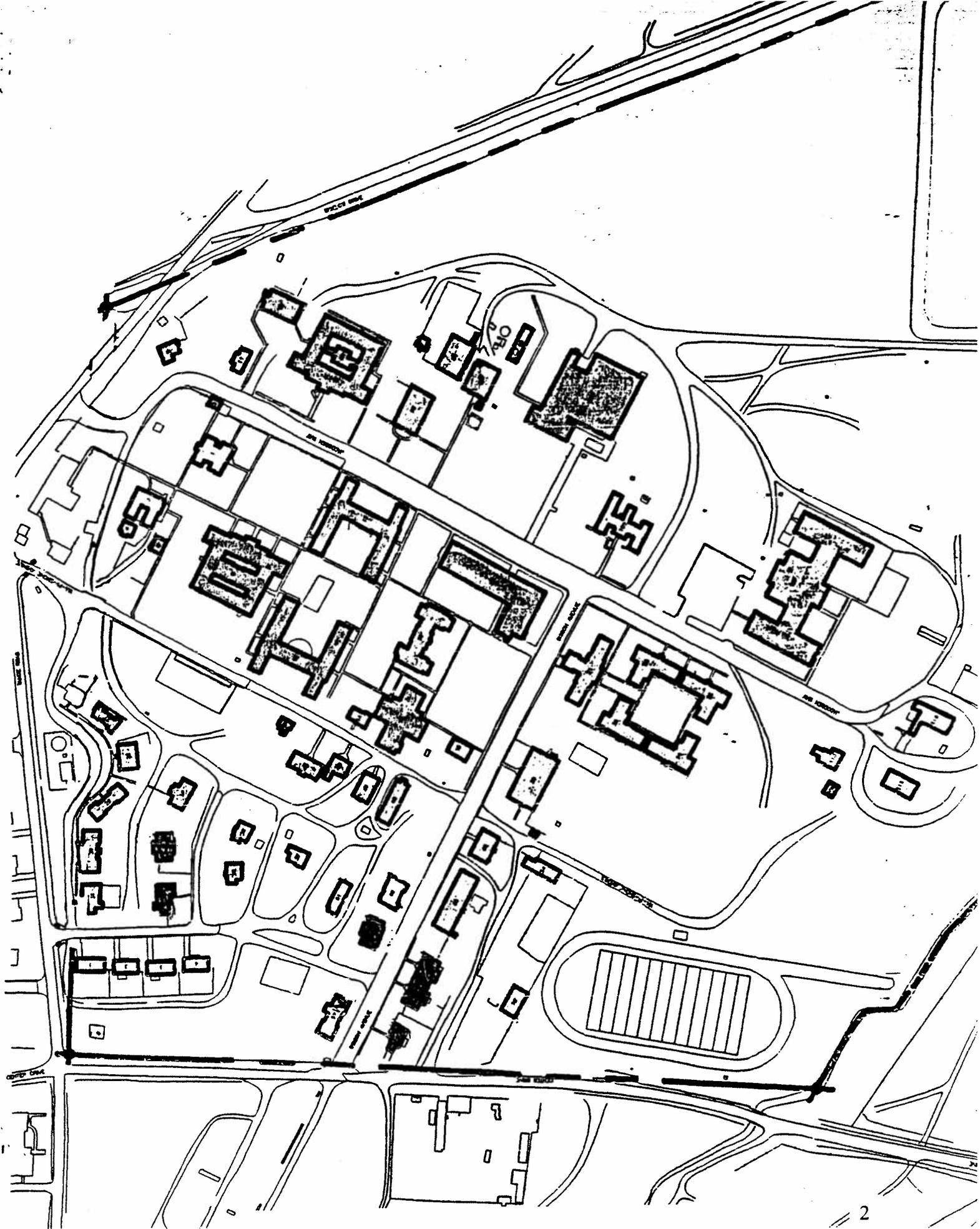
## General Observations

We examined approximately 316 trees on the school grounds. As mentioned above, the majority of the trees were in the interior of the property. Many trees located around the perimeter of the property, and away from any structures were ignored. We identified approximately 25 trees species on the property. However, not all trees were identified to the species level. The majority (63%) of the species on the property are cottonwoods and Siberian elms. Nine species comprise 90% of all the trees present. (See Table 1)

As would be expected, the older trees are generally in the poorest condition, while the younger trees have few problems. The most common problem is dead branches in the crowns of the older trees. This is particularly so in the older cottonwoods. As these trees age, their water requirements increase substantially. When this demand is not met, branch dieback results. Depending on their size and proximity to a target, these branches can represent a significant hazard. Removing the dead and poorly formed branches will

Table 1. Tree Species Inventoried

| Common Name   | Scientific Name                 |
|---|---------------------------------|
| Silver maple  | <u>Acer saccharinum</u> *       |
| Horsechestnut   | <u>Aesculus spp.</u>            |
| Cutleaf birch   | <u>Betula pendula</u>           |
| Incense cedar   | <u>Calocedrus decurrens</u> *   |
| Scarlet hawthorn  | <u>Crataegus laevigata</u>      |
| Green ash   | <u>Fraxinus pennsylvanica</u> * |
| Ash   | <u>Fraxinus sp.</u>             |
| Honeylocust   | <u>Gleditsia triacanthos</u>    |
| Rocky Mtn. Juniper  | <u>Juniperus scopulorum</u> *   |
| Crabapples  | <u>Malus spp.</u>               |
| Lodgepole pine  | <u>Pinus contorta</u>           |
| Jeffrey pine  | <u>Pinus jeffreyi</u>           |
| Austrian pine   | <u>Pinus nigra</u>              |
| Ponderosa pine  | <u>Pinus ponderosa</u>          |
| Norway spruce   | <u>Picea abies</u>              |
| Engelmann spruce  | <u>Picea engelmannii</u> *      |
| White poplar  | <u>Populus alba</u>             |
| Eastern cottonwood  | <u>Populus deltoides</u> *      |
| Fremont cottonwood  | <u>Populus fremontii</u> *      |
| Douglas-fir   | <u>Pseudotsuga menziesii</u>    |
| Pin oak   | <u>Quercus palustris</u>        |
| Red oak   | <u>Quercus rubrum</u>           |
| Black locust  | <u>Robinia pseudoacacia</u> *   |
| Weeping willow  | <u>Salix babylonica</u>         |
| Littleleaf linden   | <u>Tilia cordata</u>            |
| American elm  | <u>Ulmus americana</u>          |
| Siberian elm  | <u>Ulmus pumila</u> *           |
| * one of 9 species comprising 90% of the trees on grounds |                                 |



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Map 1. Stewart Indian School with Inventory Areas

significantly reduce the hazard to people and property from falling branches. Some of the large old trees have significant internal decay and should be removed.

Many trees have secondary sprouts originating from their base. These should be removed where they are found. Some areas of the school have large numbers of new seedlings and saplings growing, particularly around elm trees. The majority of these new trees should be removed before such removal becomes more costly. Younger planted trees, as mentioned, are in fair to good condition. The most significant problem on them is occasional basal damage from lawn maintenance equipment (string trimmers). A three-foot diameter turf free ring should be established around all trees located in the lawn. The ring should be filled with four inches of organic mulch. Keep the mulch four inches away from the tree trunk. Corrective pruning on some of these trees now, will prevent problems in the future with poor branch architecture.

### Specific Recommendations by Area

The following sections each cover a specific area of the grounds and provide tree specific recommendations. Refer to the Site Map (Map 1) for the boundaries and locations of the specific areas.

#### Area A

This area is located around the museum, bldg. 1. See Map 1 for location. We inspected 18 trees in this area. See Map 2 for tree locations.

There is a group of blue spruces on the north end of the sidewalk leading to the museum. The trees are closely spaced and some are overtopped by adjacent cottonwoods. One of

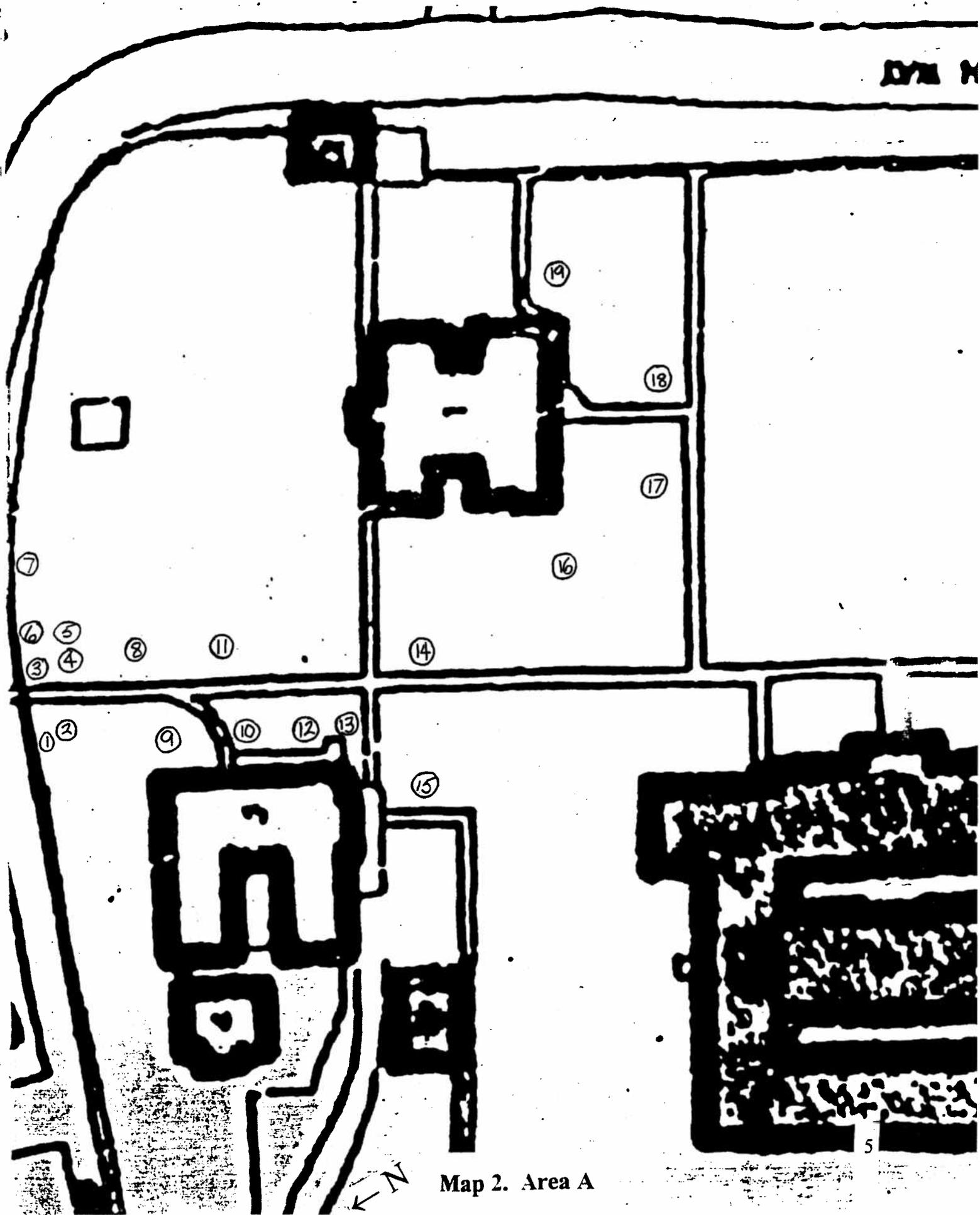


Figure 1. Topped Spruce

the spruces (tree # 6) has been topped (see Figure 1). Removal of the topped tree will reduce competition and eliminate any future problems associated with the topping cut. Branches in the adjacent cottonwood (tree #8) that hang over the spruce should be pruned off.

The cottonwood inside the walkway leading to the museum (tree #9) has a great deal of dead branch material in it. Much of this material is overhanging the museum. The tree's roots are cracking the building's porch and lifting the walkway, creating a safety hazard. **This tree is a hazard and should be removed.**

The incense cedar (tree # 10) located in front of the museum is a very nice specimen. No more branches should be removed unless they are interfering with the building or pedestrian traffic.



Map 2. Area A



Figure 2. Crowded Junipers.

Additionally, consideration should be given to vertical mulching the compacted soil over the tree's root zone and applying three to four inches of organic mulch in this area for long term benefit.

Tree #11, a cottonwood, needs the dead wood pruned out, and the lower branch that hangs over the lawn to the east should be removed.

**The smallest in a group of three junipers (tree #15) located south of the museum (see Figure 2) should be removed** to provide adequate growing space for the remaining trees.

All other trees located within area A should be inspected for dead and broken branches (widow makers). This material should be removed.

### Area B

Area B extends from the museum south to the south side of bldg. 6, and from the east side of bldg. 6 to Wa-Pai-Shone Avenue (see Map 1). We evaluated 21 trees in this area; refer to Map 2 for tree locations. Again, most of the trees in this area have dead branches which should be removed. Any broken branches should be pruned to eliminate stubs.

The Austrian pine (tree #8) located on the east side of Wa-Pai-Shone Ave., north of the parking lot is declining. All branch stubs and broken branches should be pruned, and supplemental irrigation should be provided.

The large cottonwood (tree #9) should be watered every three weeks through the growing season. This is a large, specimen tree that has a lot of die back in the crown, partially due to insufficient moisture.

The 36" dbh cottonwood located north of the Trading Post (tree #12, Figure 3) has significant trunk decay with inadequate sound wood to make the tree safe. **This tree is hazardous and should be removed.**



Figure 3. Basal decay on Cottonwood



The cottonwoods running north-south along the sidewalk east of bldg. 6 are in poor condition. **Three of the trees should be removed**, and all of the trees need pruning to remove dead and broken branches.

- The cottonwood (tree #13, Figure 4) located south-east of the museum, just north of the sidewalk running along the south side of bldg. 1, has 3-12" diameter pruning wounds along the trunk which are filled with decay. All branches have been topped and the tree is declining. **Consider removing tree**, or watch and plan for the tree's replacement.

- Tree #14 is on the opposite side of the north-south sidewalk from #13. It is another cottonwood with all its branches stub-cut (Figure 5). The tree has little live crown left and has very low vigor. **This tree should be removed.**

- Tree #18 is the next to last cottonwood in the row. The tree very likely has significant internal decay from old pruning wounds. Basal decay has caused significant root loss on the windward side of the tree (Figure 6). **This tree is a hazard and should be removed.**



Figure 4. Cottonwood with decay at pruning wounds.

Trees 21-23 are all cottonwoods located in the median between Wa-Pai-Shone and the parking lot, immediately west of bldg. 6. The trees have all been severely topped (Figure



Figure 5. Severely topped Cottonwood



Figure 6. Basal decay on Cottonwood

7), have little live crown remaining and will likely continue to deteriorate. Rather than continue to prune dead branches as they occur, consideration should be given to removal and replacement. If the trees are retained, they should be given supplemental irrigation throughout the growing season.



Figure 7. Topped Cottonwoods on Wa-Pai-Shone

### Area C

This area extends east from Bldg. 12 to the boiler room (bldg. 92).

See Map 1 for area location. We evaluated 13 trees in this area. The trees species in the area are more diverse than in the previous two areas. Refer to Map 4 for tree locations.

There is a multi-trunked elm off the north-east corner of bldg. 12 (Figure 8). **The tree is not adding anything to the landscape and could be removed** and replaced with a more valuable tree species.

**The elms growing against the north side of bldg. 13 should be removed** before they increase in size and cause structural problems.

The row of young honeylocusts along the north side of the entrance to the parking lot between bldgs. 89 and 90, are in very poor shape. Consider removing these “trees” and replacing with new ones.

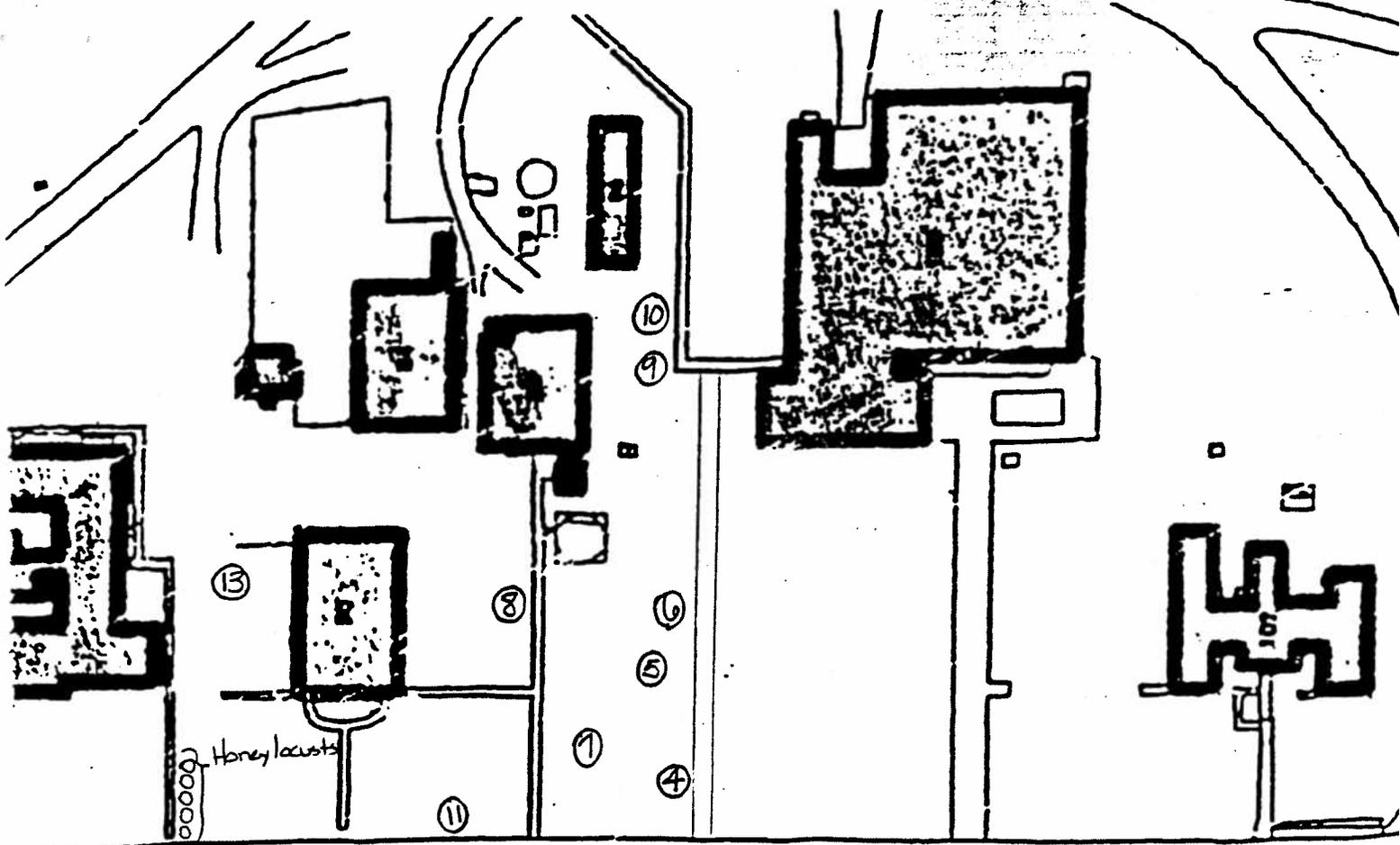
The cottonwoods (tree #s 1 & 2) on the east side of bldg. 13 have hanging dead branches that should be removed. While in the tree, workers should pruned out all other dead branches too.

There is an apple tree (#3) located in the turf between bldgs. 13 and 17 has codominant stems with significant stem decay. The tree doesn't present a hazard since the presence of a target is unlikely. However, failure of one of the main stems is likely unless the tree is braced with a rod.

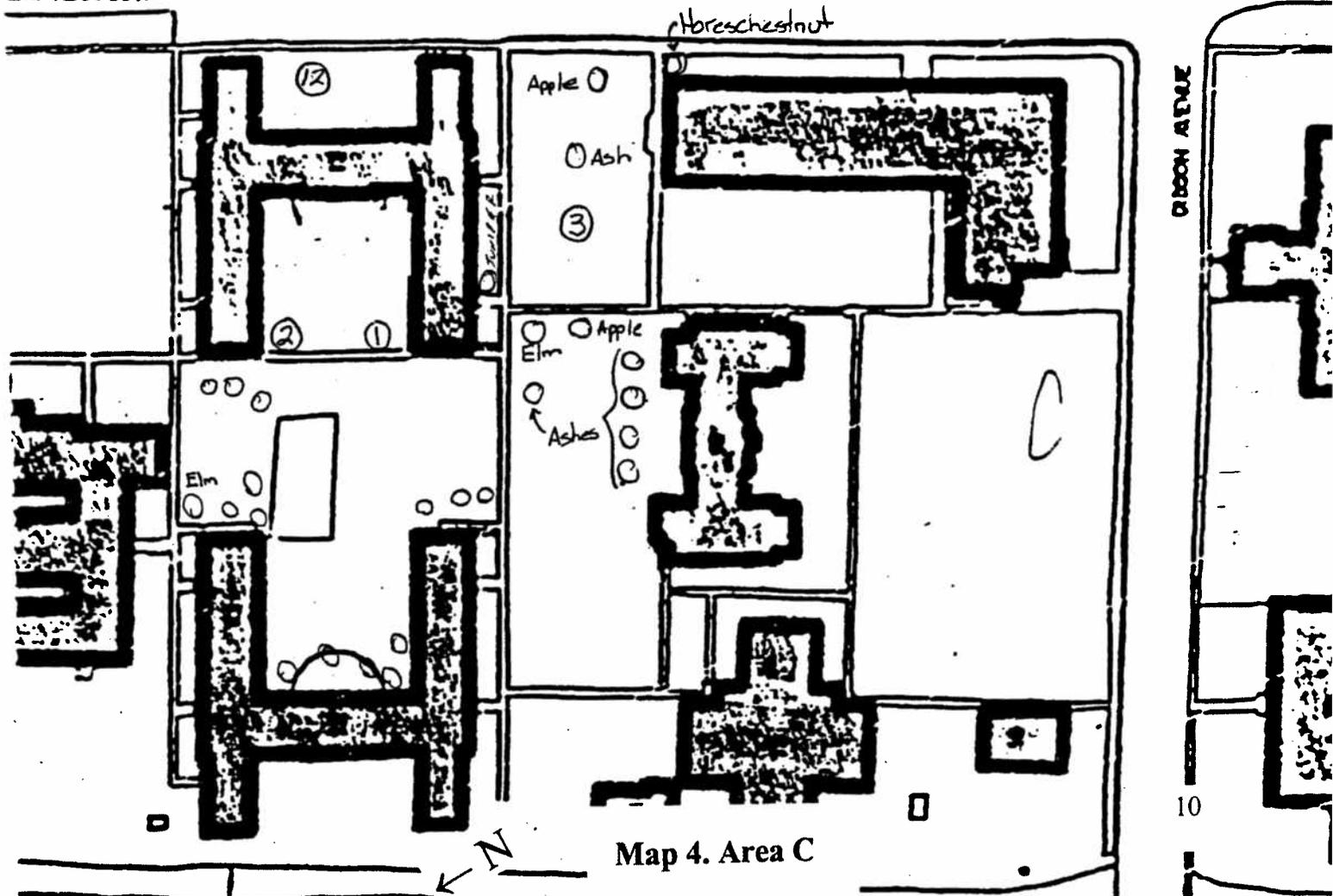
There is a black locust (tree #4) located on the north side of the entrance to the parking lot between the boiler room and bldg. 160. The tree has significant basal decay which has caused a large crack to develop up the stem (Figure 9). **This tree is a hazard and should be removed.**



Figure 8. Multi-stemmed Siberian Elm



ONE PASSAGE



Map 4. Area C



Figure 9. Cracked Black Locust



Figure 10. Paved-over root zone.

Trees #5-12, all cottonwoods, have numerous dead branches that should be removed. Tree # 13, located in the parking lot between bldgs. 89 and 90 (Figure 10) is causing significant buckling of the recent paving. The tree is in need of a significant amount of pruning. The recent paving of the lot has likely caused significant harm to the root system of the tree. Watch this tree for signs of declining. **If a decision is made to keep this tree, the pavement should be removed out to a minimum of the trees drip line and a root system inspection should be performed. Alternatively, consideration should be given to removal of this tree.**

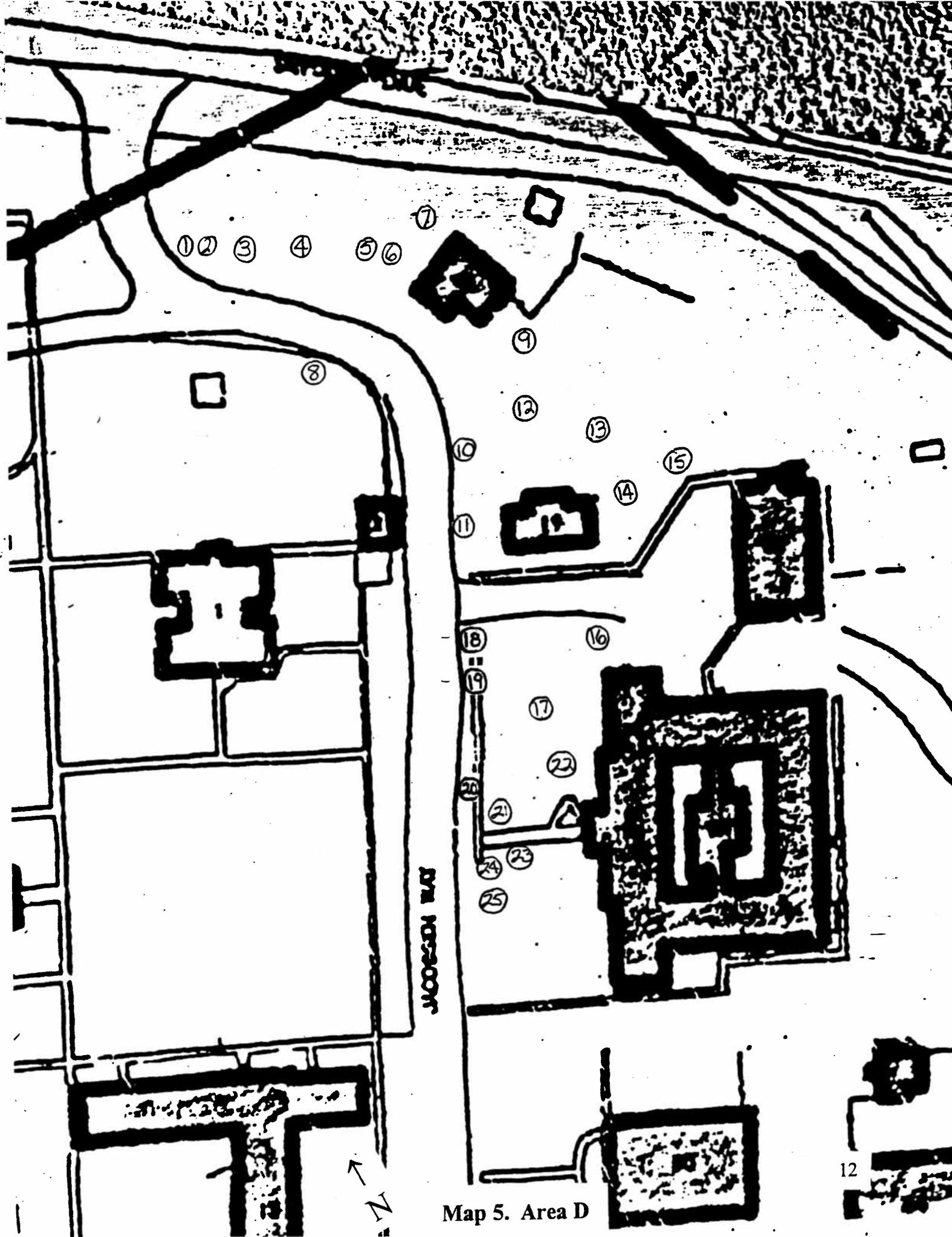
#### Area D

This area is located in the NE corner of the School grounds and extends south to the old principal's house, bldg. 11 (see Map 1 for location). Twenty-five trees in this area were evaluated.

There is a row of cottonwoods along the north side of the entrance drive (Jacobsen Way) that are in fair condition. See Map 5 for tree locations. However, they all have dead branches that need to be removed (tree #s 1-7).



Figure 11. Cracked Black Locust



Map 5. Area D

The black locust in the turf area on the south side of Jacobsen Way (tree #8) is cracked completely through the main stem (Figure 11). **This tree should be removed.**

The elm located east of the driveway to bldg. 9 has numerous dead branches which should be removed.

Tree #s 10 and 11 are both cottonwoods lining Jacobsen Way near the old principal's house. Both of these trees need some major work to make them safe. All of the major branches on tree #10 have been stub-cut, which has likely caused internal decay in the branches. The tree is declining as evidenced by the thinning live crown. All dead material should be removed and the tree should be monitored for continued decline. Consider removal. Tree #11 has many dead branches that should be removed. Some have already fallen and punched holes through the roof of bldg. 11. There is a large branch hanging over the building that appears from the ground to have a large crack in it, predisposing it to fail. This branch should be inspected closely and removed if the crack is significant. While pruning out all other dead branch material, past stub-cuts and broken branch stubs should be inspected for decay and associated hazards.



Figure 12. Cottonwood with conks on stem

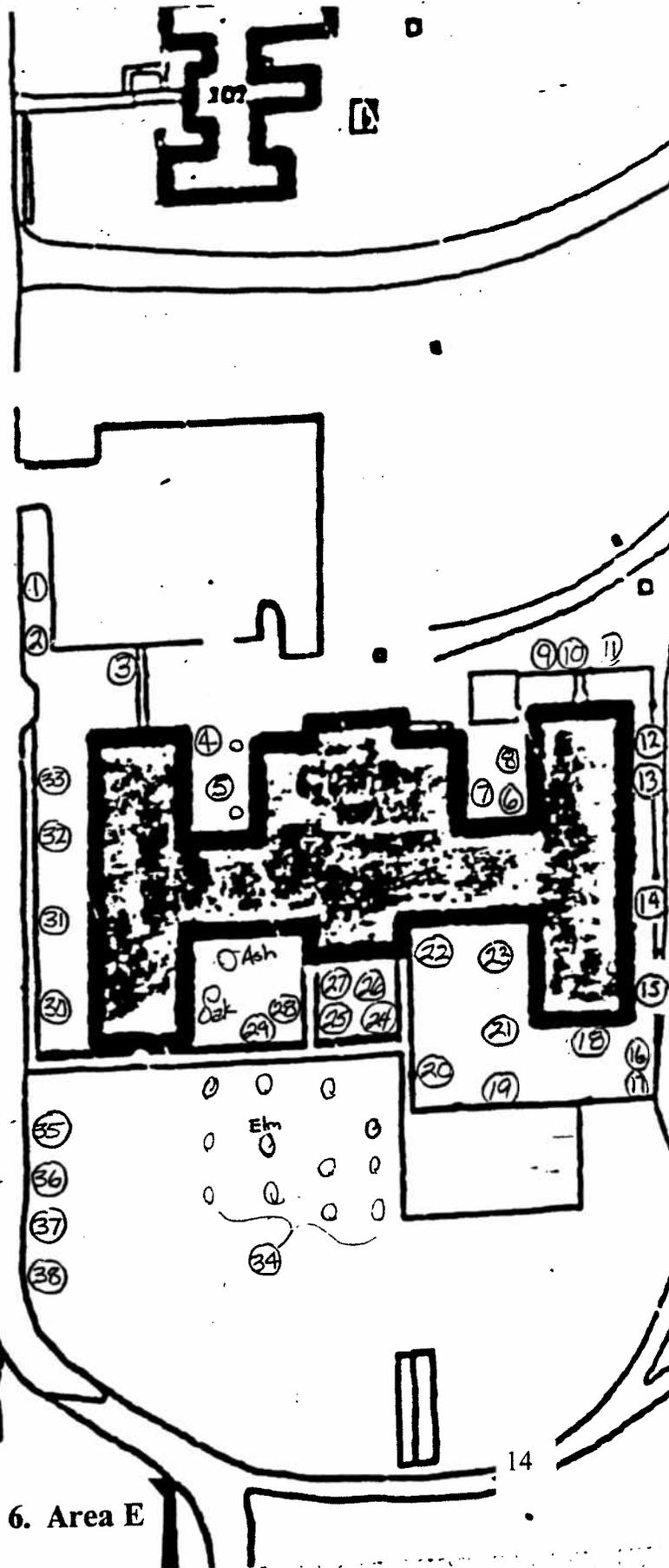
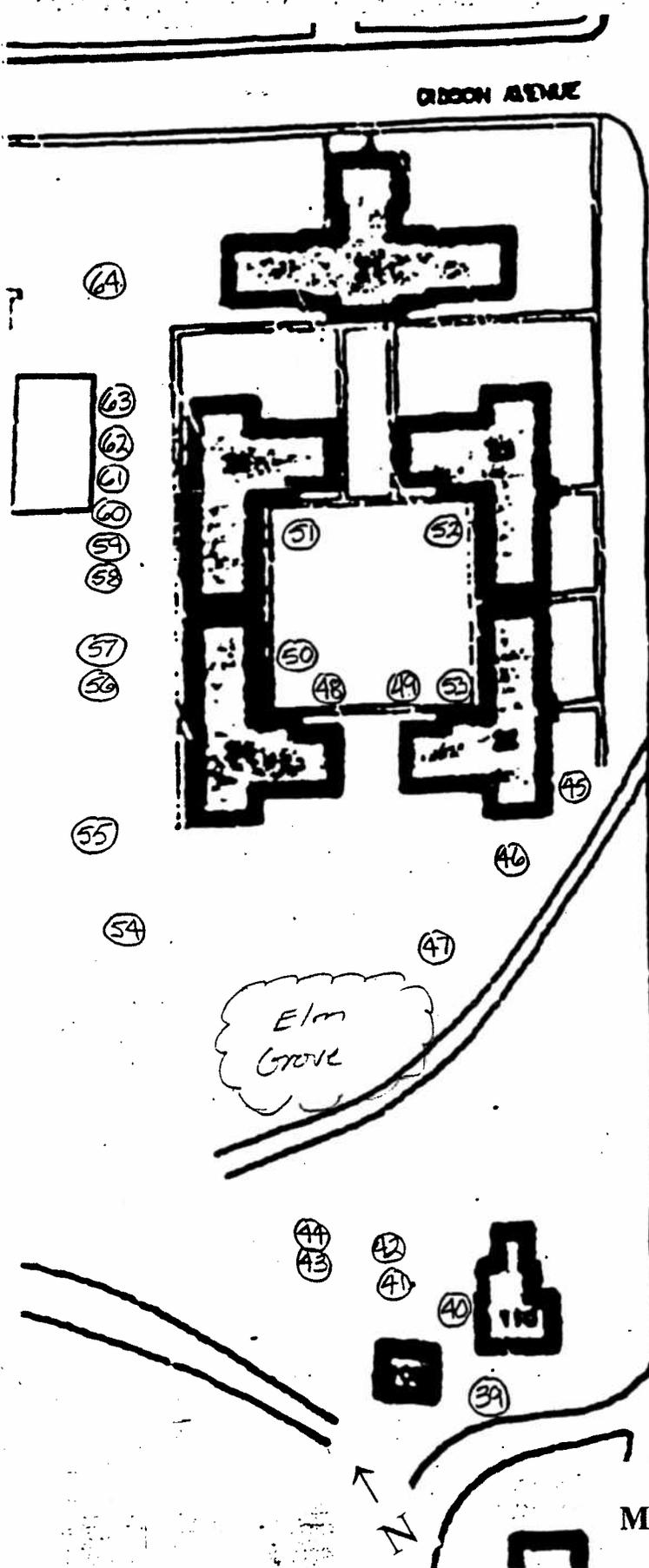
Tree #13, a cottonwood on the north-east side of bldg. 11 has conks (mushroom-like growths) extending up the north side of the main scaffold branch (Figure 12). These conks are indicative of extensive heart rot. **This tree should have a careful inspection for internal decay and should be removed if an unacceptable hazard exists.**

Tree #22, the black locust in front of bldg. 89, contains broken branches which should be pruned. Previously stub-cut branches should be properly pruned.

Tree #25, the elm located on Jacobsen Ave. off the SW corner of bldg. 89, has codominant stems with included bark, a decay pocket in the base and bacterial wetwood. The tree should be removed or bolted. Crossing branches should be pruned out.

### Area E

This is one of the larger areas in the plan. It is located in the SE portion of the school complex, and includes bldgs. 22-25, and 108-110 (see Map 1). The area contains 64 trees that were evaluated. For tree locations see Map 6.



Map 6. Area E

Tree #1, a cottonwood with an old wound running from five feet up to 20' high. Tree has internal decay. Tree has sufficient sound wood (7") at base of scar to compensate for the decay. However, samples should be taken further up the stem along the scarred portion to make sure sufficient sound wood is present higher up. Use a certified arborist to make this evaluation.

Tree #3, a 54" dbh cottonwood. Remove the STOP sign from the tree. Decay pocket six feet up stem in old pruning wound. The decay appears to be contained within the branch stub. There is nine inches of sound wood to compensate for the decay.



Figure 13. Siberian Elm with lean

Tree #4, an Austrian pine. Prune off lower branches hitting the building.

Tree #8 has a lean to the north-west with soil mounding on opposite side (Figure 13). There is no root flare evident. Tree may have begun to lean due to root problems. There is a small utility building in the direction of the lean. Suggest removing this tree.

Tree #s 10 and 14 are lindens which could use some corrective pruning in order to improve branch spacing, repair broken branches and avoid future problems.

Tree #s 41 and 42. Elms in very poor condition, with numerous dead branches. **Suggest removal.**

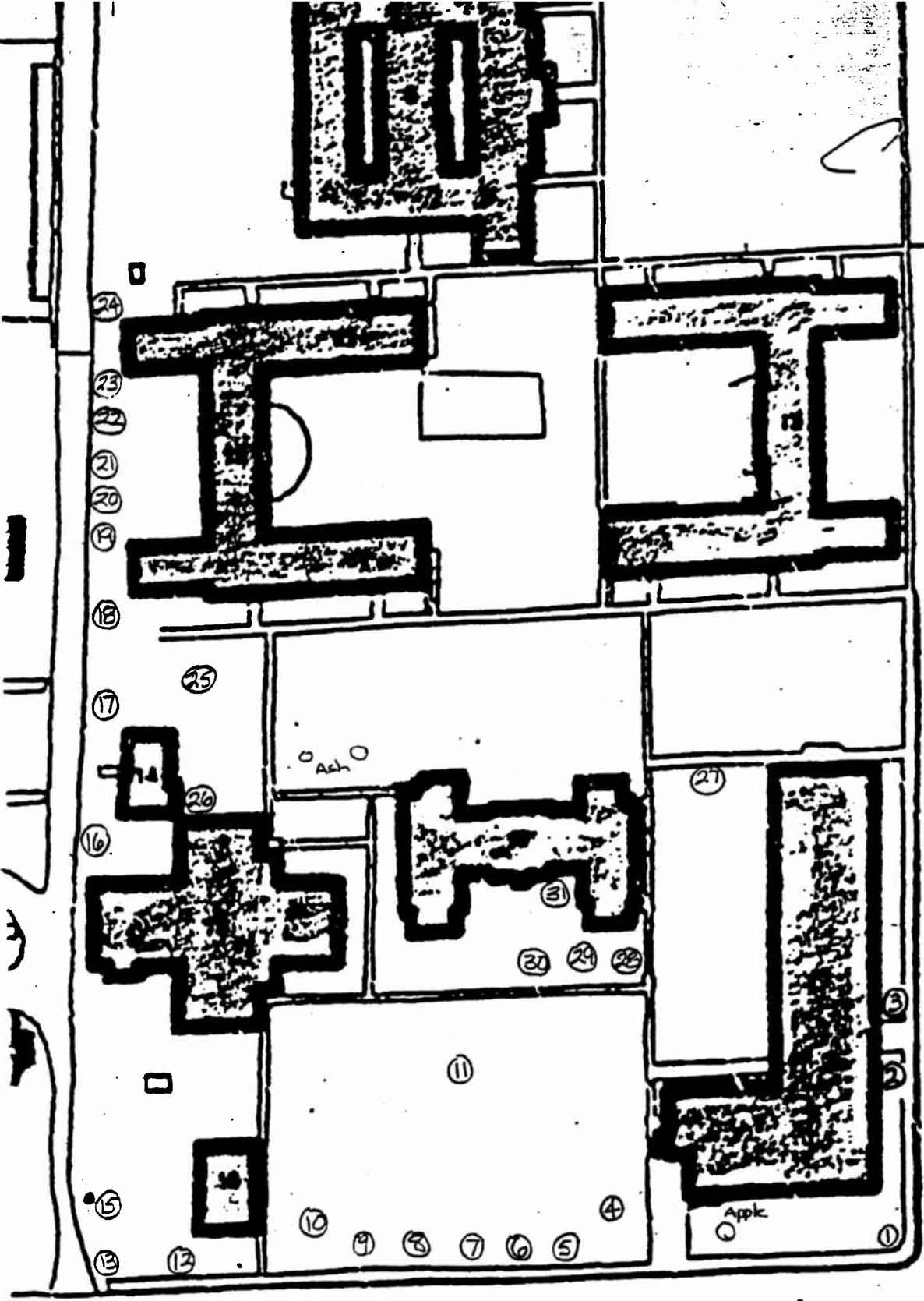
#### Area F

This area is located north of Gibson Ave., between Jacobsen Way and Wa-Pai-Shone Ave. (see Map 1). Thirty-two trees in this area were examined. See Map 7 for tree locations.

Tree #1, green ash. Remove lower branches that are hanging over intersection.

Tree #4, a cottonwood with 3 main scaffold branches. The northwest one has a large decay hollow where a branch broke off. Immediately above that is a four inch diameter dead branch. This branch should be removed.

Tree #14, may be the largest cottonwood on the grounds. Past pruning and branch breakage has left several large decay pockets in the upper branches. Future branch failures are likely. However, given the tree's significance (large size) and the unlikely presence of any targets, I recommend the tree be kept.



JACOBSON WAY

ORSON AVENUE



Map 7. Area F

Tree #s 18-24, row of cottonwoods along Wa-Pai-Shone Ave. All the trees are in poor condition (Figure 14). Replacement trees should be planted in between the cottonwoods and the larger trees eventually removed. This would help lessen the visual impact of removing several large trees from this area at once.

Tree #20 has a large hollow in the base and is cracked further up the stem (Figure 15). **This tree should be removed.**

Tree #22 has minimal live crown. Pruning out the dead wood would leave minimal crown. **This tree should be removed.**

Prune dead wood out of tree #s 23 & 24. Tree #24 has crown gall at the base with a large decay pocket behind the gall. Watch tree for signs of leaning in the future.

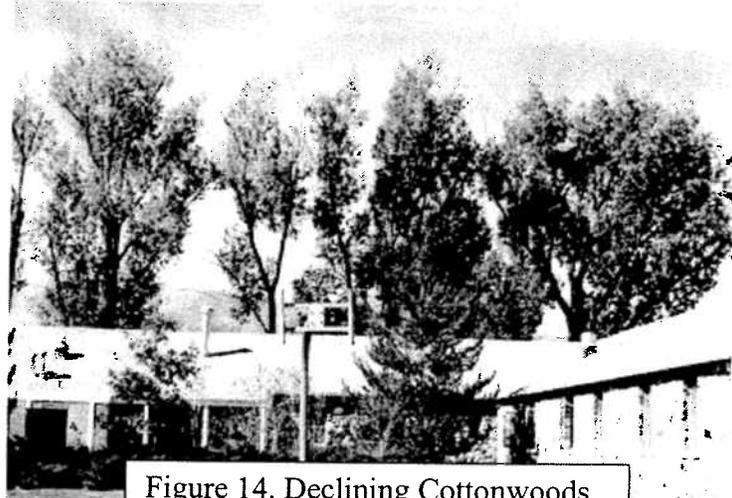


Figure 14. Declining Cottonwoods



Figure 15. Cracked Cottonwood

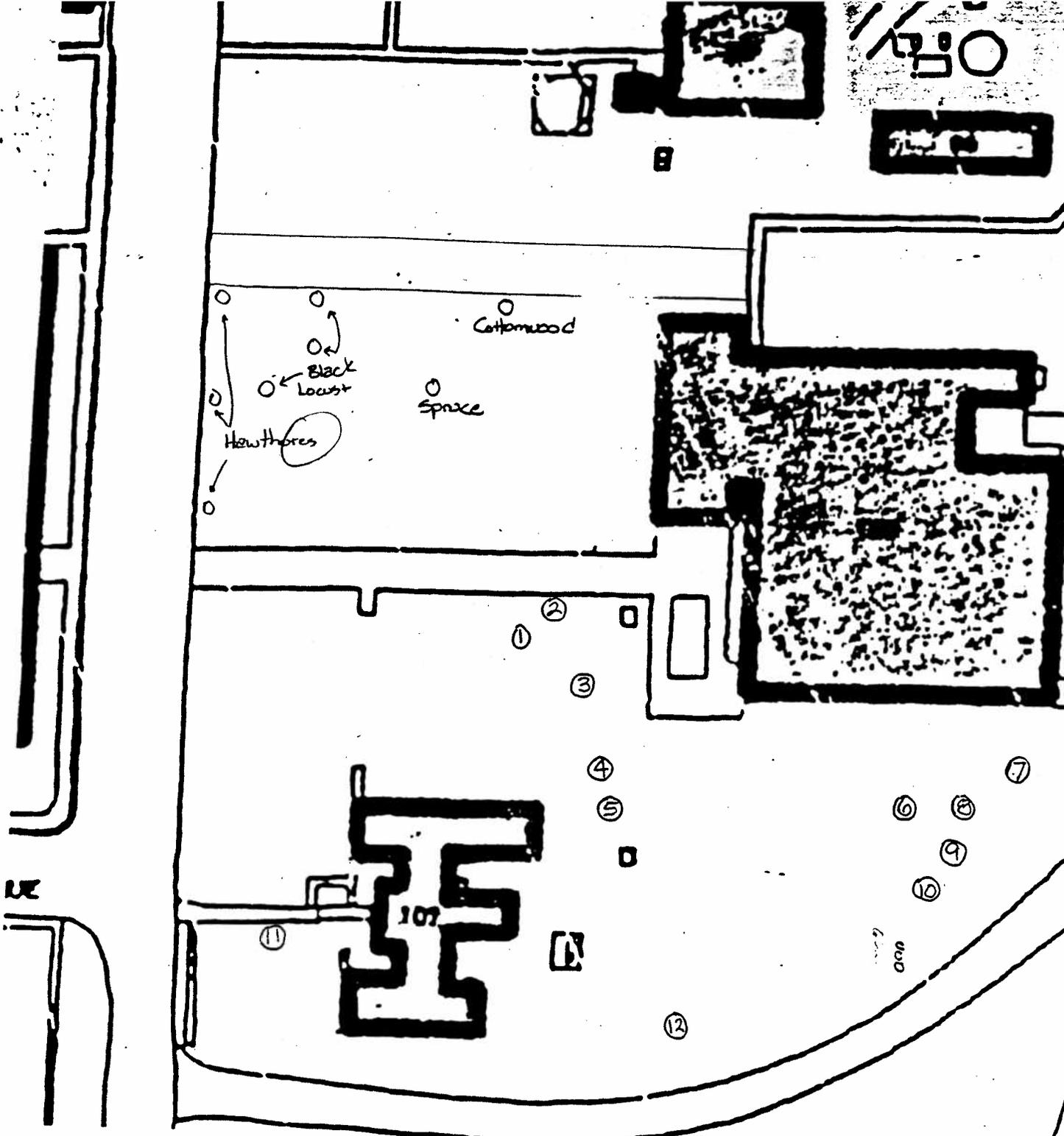
Tree #27, green ash. Remove broken branch hanging over playground area.

### Area G

This area is located on the eastern edge of the school grounds, near the Academy Restaurant and Store (bldg. 160), between areas C and E (see Map 1). It is a small area with few trees. We evaluated 11 trees in this area. See Map 8 for tree locations.

The biggest need is to prune dead branches out of the mature trees, and provide supplemental irrigation to the trees in the area.

There are numerous Siberian elm sprouts around tree #4, a crabapple. These sprouts should be removed in order to provide better growing conditions for the crabapple.



Map 8. Area G

## Area H

This long, narrow area lies between Wa-Pai-Shone and Stewart Avenues, with the southern border formed by Gibson Ave (see Map 1). A total of 16 trees in the area were examined. See Map 9 for tree locations.

The trees in this area are all in marginal condition, largely as a result of no irrigation. If the goal is to retain these trees and have them contribute to the area's urban forest, supplemental irrigation should be provided.

Tree #2, a cottonwood located along the south border of the parking lot in the <sup>north-east</sup> ~~NE~~ section of the area. This tree has dead branches overhanging the lot, which in the event they fail, would cause damage to any cars parked below them. These branches should be removed.

Tree #5, a cottonwood with very large, dead branches overhanging the Capitol Police substation bldg. These dead branches should be removed before they fall and damage the bldg.

Tree #6, a Siberian elm. Remove this tree to provide growing space to adjacent trees.

Tree #7, a Siberian elm. Remove the fork of this tree which is overhanging the juniper (tree #8). Also prune out dead wood.

Tree #9, a Siberian elm. Remove tree.

Tree #14, a Siberian elm. This tree has a large dead branch overhanging the parking area on Gibson Ave. This branch should be removed before it falls and damages cars parked on the street.

Tree #15, a Siberian elm. Tree has excess dirt piled around the base. This fill should be removed to avoid harming the tree's roots and causing stem decay.

## Area I

This area is located at the <sup>north-west</sup> ~~NW~~ corner of the grounds. It is bounded on the west by Stewart Ave, the east by Sierra Ave, the north by Crescent Dr. and the south by Pawnee Ave. (see Map 1). Forty-six trees were evaluated within this area. Tree locations are shown on Map 10. Priorities in this area are the trees that are threatening people and property. Maintenance recommendations for the other trees within this area are of questionable value if the trees will not be irrigated.

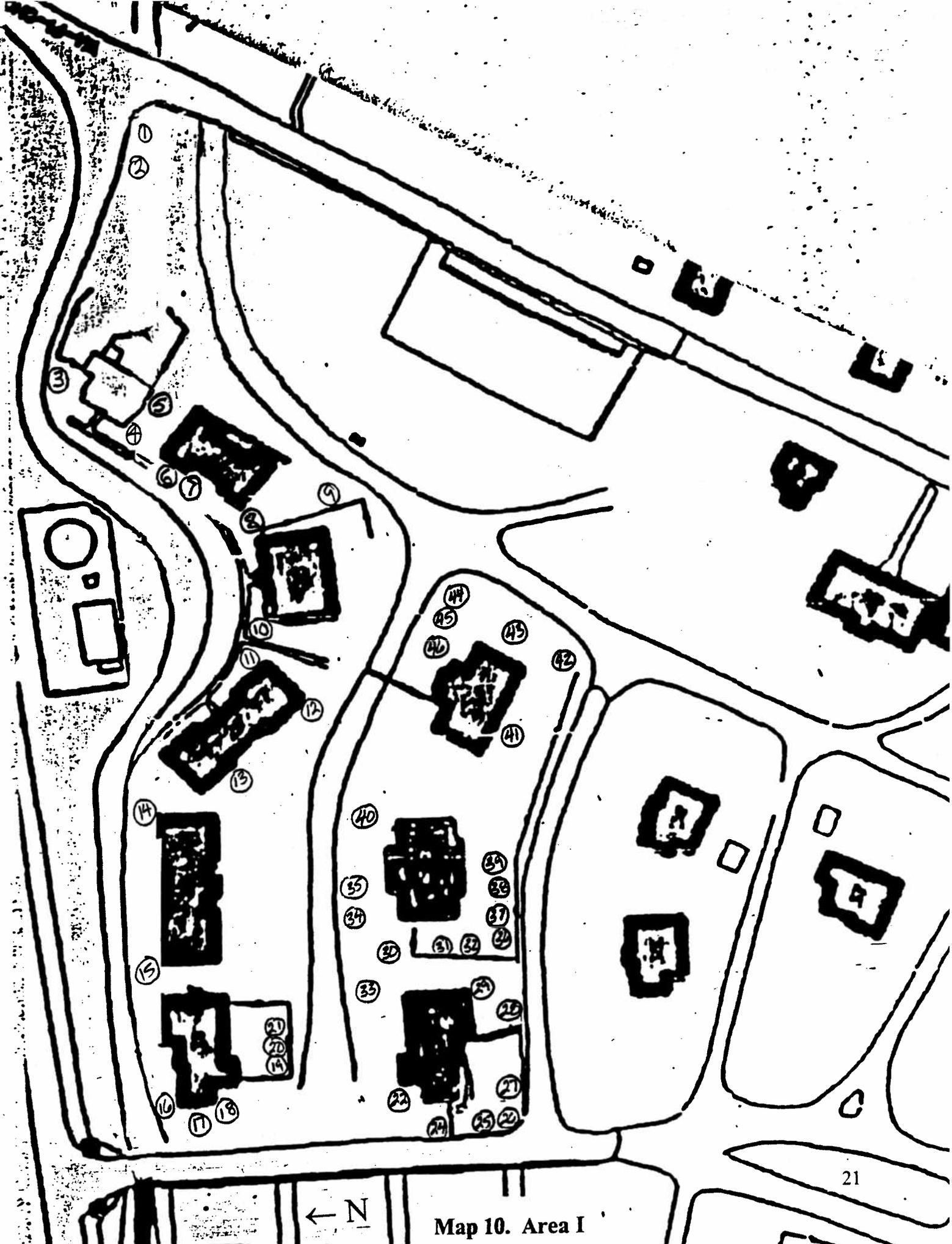
Most of the trees in this area are Siberian elms, a "weedy" species. Many are in marginal condition; lack of care and irrigation is responsible for their status. The prolific seeding of this species has led to many young trees, most located in undesirable locations. Most, if not all, of these young seedlings and saplings should be removed.



GREEN AVENUE



Map 9. Area H



Map 10. Area I

Tree #1, a Siberian elm. Tree has codominant stems, one of which is badly wounded. (Figure 16) This tree is in poor condition. **Recommend removal.**



Figure 16. Siberian Elm with co-dominant stems and wounds

Tree #s 6 and 7. Blue spruces. These are the nicest, most valuable trees in area I. Strongly recommend that they be provided irrigation. Additionally, prune the dead branches from them.

Tree #8, a Siberian elm. Remove the north fork to eliminate conflict with adjacent spruce (tree #7). Also needs additional corrective pruning.

Tree #s 9-21, Siberian elms. Most, if not all, have dead branches in them that need to be removed. Provide these trees with irrigation.

Tree #15. Poor branch architecture creating higher likelihood of branch failure. Consider removal of this tree.

Tree #18. Tree has significant stem decay as evidenced by cavities. Remove this tree.

Tree #22, Siberian elm. **Remove**, tree is too close to the structure and most of the major branches have been stub-cut (Figure 17).

Tree #24, Siberian elm. Tree has large dead branch hanging in it – remove. Prune out dead wood.

Tree #25, Siberian elm overhanging children's play area. This tree has many dead branches which will fall into the playground when they break. Remove these branches.

Tree #27, Siberian elm. Dead branch hanging over picnic area – remove.

Tree #28, Siberian elm. Tree overhangs children's playground (Figure 18). There are numerous dead and poorly formed branches creating a hazard to children playing below. **The tree cannot be improved and should be removed.**



Figure 17. Stub cut, hazardous Siberian Elm



Figure 18. Siberian Elm overhanging children's playground

Thin the multiple black locusts along the fence in front of the building on Pawnee Ave. at the intersection with Sierra St. Select the best formed tree to retain.

Tree #29, cottonwood sucker. Growing against the fence and will cause damage. **Remove.**

Tree #37, Scarlet hawthorn. Poorly formed tree; future liability. **Remove tree.** Also, remove the suckers sprouting from adjacent hawthorn.

Tree #39, Siberian elm. Remove the branch that is interfering with the growth of the adjacent Jeffrey pine (Figure 19).

Tree #40, Siberian elm. Dead branches hanging in powerline – prune. Refer to ANSI Standards for safety (Appendix A).

Tree #41, Black locust. Tree has codominant stems which seem likely to split apart. Consider bolting tree.

Tree #45, cottonwood. **Remove** to provide adjacent trees room to grow.

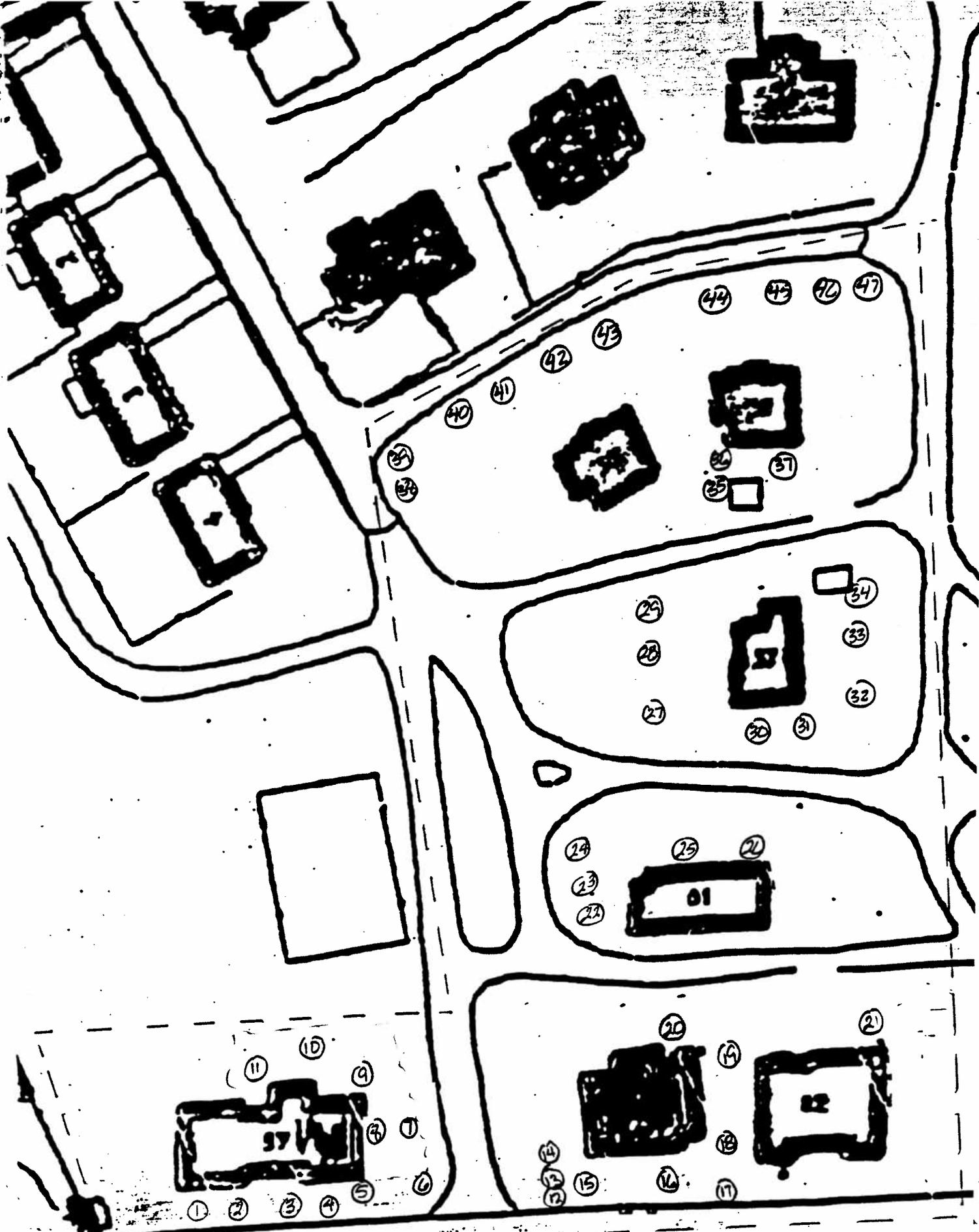
Area J

This area is located south of area I, between Pawnee and Gibson, and Stewart and Sierra Avenues (see Map 1). We examined 47 trees within this area. Refer to Map 11 for tree locations.

The trees located along, or associated with buildings along Gibson Ave. are irrigated, or can be irrigated, since the buildings are occupied. The portion of the area to the north is more similar in character to area I, in that it much of it has been largely abandoned. Most of the trees do not receive irrigation and are in relatively poor condition with a considerable amount of dead branches.



Figure 19. Siberian Elm encroaching on Jeffrey pine



**GREEN AVENUE**

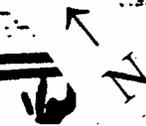




Figure 20. Hazardous branch in Cottonwood

Tree #1, Juniper. Remove old branch stubs from previous pruning.

Tree #5, Siberian elm. Remove sucker from against house.

Tree #6, a clump of cottonwoods. Thin to remove all but the best formed tree.

Tree #19, cottonwood. This tree has two scaffold branches, one of them is dead and represents a hazard to the occupants of surrounding structures (Figure 20). Removing this branch would leave insufficient live crown. **Recommend tree be removed.**

Tree #22 & 23, Siberian elms. Remove dead branches that are overhanging the house and parking lot area.

### Area K

This small area is located south of Gibson Avenue, between Wa-Pai-Shone and Sierra Avenues (see Map 1). We looked at fifteen trees in this area. Map 12 shows the tree locations.

Tree #2, Incense cedar. Tree is located under power lines. Corrective pruning to avoid conflicts with lines and clean-up of old branch stubs is warranted.

Tree #3-5, Junipers. Trees located under powerlines (Figure 21). Recommend removal of tree #3 and pruning of branches on #s 4 and 5 where they are interfering with the powerlines. ANSI Standards for safety should be followed (see Appendix A).



Figure 21. Junipers in powerlines



Map 12. Area K

## Appendix A

### ANSI Standards

ANSI A300-1995: Tree, Shrub and Other Woody Plant Maintenance – Standard Practices

ANSI Z133.1-1994: Pruning, Trimming, Repairing, Maintaining, and Removing Trees,  
and Cutting Brush – Safety Requirements

ANSI A300-1995

URBAN & COMMUNITY FORESTRY  
NEVADA DIVISION OF FORESTRY  
123 W NYE LANE SUITE 142  
CARSON CITY NV 89710

NEVADA DIVISION OF FORESTRY  
123 West Nye Lane  
Carson City, NV 89710

*for Tree Care Operations –  
Tree, Shrub and Other Woody  
Plant Maintenance –  
Standard Practices*

ANSI A300-1995

**American National Standard**



**American National Standards Institute**

11 West 42nd Street  
New York, New York  
10036

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- 3.5 branch collar:** Trunk tissue that forms around the base of a branch between the main stem and the branch or a branch and a lateral. As a branch decreases in vigor or begins to die, the branch collar becomes more pronounced.
- 3.6 branch bark ridge:** Raised area of bark in the branch crotch that marks where the branch wood and trunk wood meet.
- 3.7 callus:** Undifferentiated tissue formed by the cambium layer around a wound.
- 3.8 cambium:** Dividing layer of cells that forms sapwood (xylem) to the inside and bark (phloem) to the outside.
- 3.9 climbing spurs:** Sharp, pointed devices affixed to the climber's leg used to assist in climbing trees (also known as *gaffs, hooks, spurs, spikes, climbers*).
- 3.10 closure:** The process of woundwood covering a cut or other tree injury.
- 3.11 crotch:** The angle formed at the attachment between a branch and another branch, leader, or trunk of a woody plant.
- 3.12 crown:** The leaves and branches of a tree or shrub; the upper portion of a tree from the lowest branch on the trunk to the top.
- 3.13 crown cleaning:** The removal of dead, dying, diseased, crowded, weakly attached, low-vigor branches, and watersprouts from a tree's crown.
- 3.14 crown raising:** The removal of the lower branches of a tree in order to provide clearance.
- 3.15 crown reduction:** The reduction of the top, sides, or individual limbs by the means of removal of the leader or longest portion of a limb to a lateral no less than one-third of the total diameter of the original limb removing no more than one-quarter of the leaf surface.
- 3.16 crown thinning:** The selective removal of branches to increase light penetration and air movement, and to reduce weight.
- 3.17 cut:** The exposed wood area resulting from the removal of a branch or portion thereof.
- 3.18 decay:** Degradation of woody tissue caused by biological organisms.
- 3.19 espalier pruning:** A combination of cutting and training branches that are oriented in one plane, formally or informally arranged, and usually supported on a wall, fence, or trellis. The patterns can be simple or complex, but the cutting and training is precise. Ties should be replaced every few years to prevent girdling the branches at the attachment site.
- 3.20 facility:** Equipment or structure used to deliver or provide protection for the delivery of an essential service such as electricity.
- 3.21 girdling roots:** Roots located above- or belowground whose circular growth around the base of the trunk or over individual roots applies pressure to the bark area, ultimately restricting sap flow and trunk/root growth, frequently resulting in reduced vitality or stability of the plant.
- 3.22 heading:** Cutting a currently growing or one-year-old shoot back to a bud, or cutting an older branch or stem back to a stub or lateral branch not sufficiently large enough to assume the terminal role. Heading should rarely be used on mature trees.
- 3.23 heartwood:** The inactive xylem (wood) toward the center of a stem or root that provides structural support.
- 3.24 hook and blade pruning tool:** A hand pruner that has a curved, sharpened blade that overlaps a supporting hook; in contrast to an *anvil-type pruning tool*.
- 3.25 horizontal plane (palms):** An imaginary level line that begins at the base of live frond petioles.
- 3.26 lateral:** A branch or twig growing from a parent branch or stem.
- 3.27 leader:** A dominant upright stem, usually the main trunk. There can be several leaders in one tree.
- 3.28 limb:** Same as *branch*, but larger and more prominent.
- 3.29 lopping:** See *heading*.
- 3.30 mycelium:** Growth mass of fungus tissue found under bark or in rotted wood.
- 3.31 obstructing:** To hinder, block, close off, or be in the way of; to hinder or retard a desired effect or shape.
- 3.32 parent branch or stem:** The tree trunk; or a large limb from which lateral branches grow.

**3.56 utility:** An entity that delivers a public service such as electricity or communication.

**3.57 utility space:** The physical area occupied by the utility's facilities and the additional space required to ensure its operation.

**3.58 wound:** The opening that is created any time the tree's protective bark covering is penetrated, cut, or removed, injuring or destroying living tissue. Pruning a live branch creates a wound, even when the cut is properly made.

**3.59 woundwood:** Differentiated woody tissue that forms after initial callus has formed around the margins of a wound. Wounds are closed primarily by woundwood.

**3.60 xylem:** Wood tissue; active xylem is called *sapwood*, inactive xylem is called *heartwood*.

**3.61 young tree:** A tree young in age or a newly installed tree.

## 4 Safety

**4.1** Tree maintenance shall only be performed by qualified tree workers, who through related training, or on-the-job experience, or both, are familiar with the practices and hazards of arboriculture, and the equipment used in such operations.

**4.2** This standard shall not take precedence over arboricultural safe work practices.

Operations shall comply with applicable Occupational Safety and Health Administration (OSHA) standards (see clause 2), ANSI Z133.1, as well as state and local regulations.

## 5 Tree pruning

### 5.1 Purpose

The purpose of this clause is to provide specifications for tree pruning.

### 5.2 Pruning practices

#### 5.2.1 Reasons for pruning

The reasons for tree pruning may include, but are not limited to, reducing hazards, maintaining or improving tree health and structure, improving aesthetics, or satisfying a specific

need such as: removing diseased, dead, dying, decayed, interfering or obstructing branches; training young trees; utility line clearance; or specialty tasks as defined in this standard. Before pruning, the primary objective should be clearly defined. That objective should be accomplished in the manner most beneficial to the health of the tree.

Pruning practices for agricultural, horticultural production or silvicultural purposes are exempt from this standard.

#### 5.2.2 When to prune

To obtain the defined objective, the growth cycles of individual species as well as the type of pruning to be performed should be considered.

#### 5.2.3 Tree inspection

Before beginning work and while work is being performed, a qualified person shall visually inspect each tree. If a condition is observed that requires additional attention, this condition should be brought to the attention of an immediate supervisor or the person responsible for authorizing the work.

#### 5.2.4 Tools and equipment

**5.2.4.1** Pruning tools used in making pruning cuts shall be kept adequately sharpened to result in final cuts with a smooth surface and firmly attached remaining adjacent bark.

**5.2.4.2** Hook and blade pruning tools should be used; not anvil-type pruning tools.

**5.2.4.3** Climbing spurs should not be used when climbing trees, except as specified elsewhere in this standard. Climbing spur use is permissible on tree removals and in emergencies such as aerial rescue.

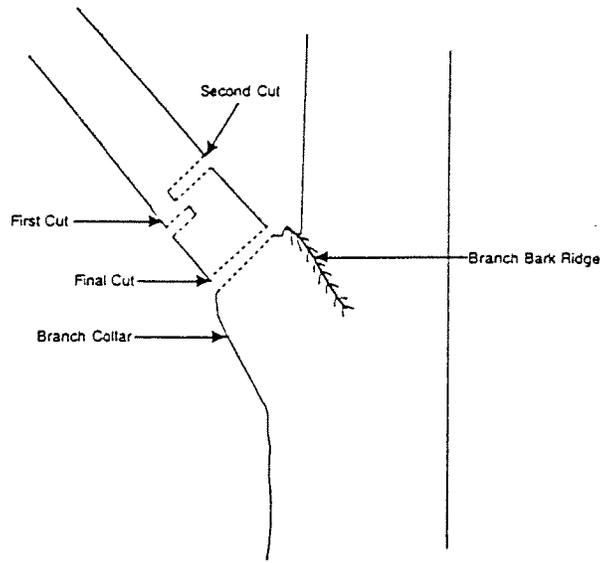
**5.2.4.4** Equipment and work practices that damage bark, cambium, live palm tissue, or any combination of these, should be avoided.

#### 5.2.5 Pruning cuts

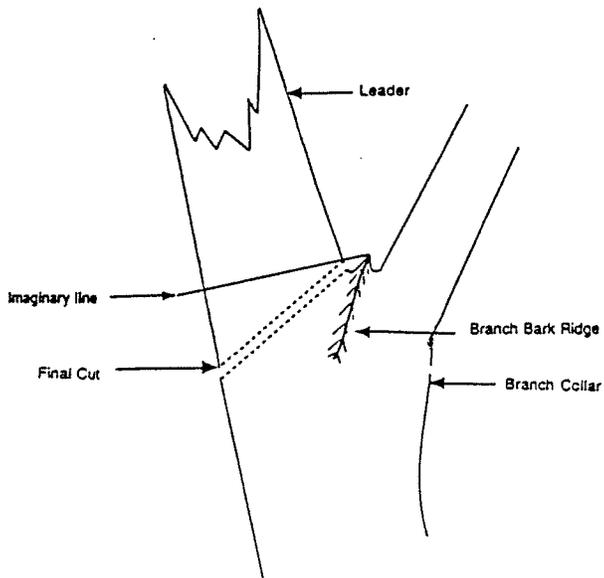
**5.2.5.1** A thinning cut should be the preferred type of cut to make.

**5.2.5.2** A thinning cut shall consist of the removal of a lateral branch at its point of origin or the shortening of a branch or stem by cutting to a lateral large enough to assume the terminal role.

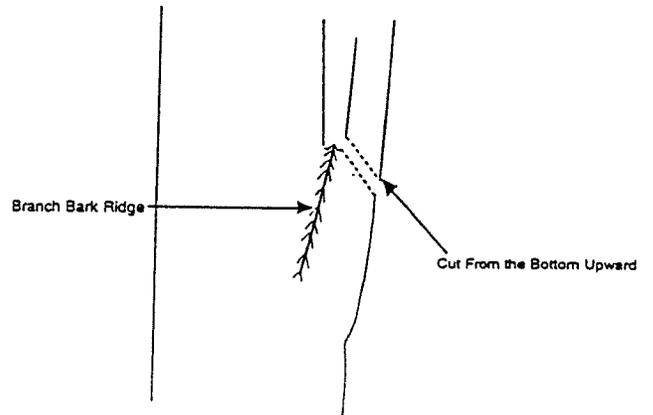
**5.2.5.3** A heading cut should rarely be used on mature trees, yet may be appropriate for



**Figure 1 – Removing a large lateral branch requires two preliminary cuts before the final cut**



**Figure 2 – When cutting back to a lateral, bisect the angle between the branch bark ridge and an imaginary line perpendicular to the leader or the branch being removed**



**Figure 3 – When removing a branch with a narrow branch attachment, cut from the bottom upward**

**5.6.1.3** Palm peeling (shaving) should consist of the removal of the dead frond bases only, at the point they make contact with the trunk without damaging living trunk tissue.

## **5.7 Utility pruning**

### **5.7.1 General**

The purpose of utility pruning is to remove branches in order to prevent the loss of service, prevent damage to equipment, avoid impairment and uphold the intended usage of the facility/utility space.

**5.7.1.1** Only a qualified line clearance tree trimmer or qualified line clearance tree trimmer trainee should be assigned to line clearance work in accordance with ANSI Z133.1, 29 CFR 1910.331 – 335, 29 CFR 1910.268, or 29 CFR 1910.269.

**5.7.1.2** Utility pruning operations are exempt from requirements in 5.2.3.

### **5.7.2 Utility crown reduction pruning**

#### **5.7.2.1 Urban/residential environment**

**5.7.2.1.1** Cuts should be made in accordance with 5.2.5 and 5.2.6.

**5.7.2.1.2** A minimum number of cuts should be made to accomplish the purpose of facility/utility pruning. The natural shape of the tree should be considered.

**5.7.2.1.3** Trees directly under and growing into the facility/utility should be removed or pruned. Such pruning should be done by removing entire branches or by removing branches that have laterals growing into (or, once pruned, will grow into) the facility/utility space.

**5.7.2.1.4** Trees growing along the side and growing into or toward the facility/utility space should be pruned by removing entire branch-

es. Branches that, when cut, will produce sprouts that would grow into facilities and/or utility space should be removed.

**5.7.2.1.5** Branches should be cut to laterals or the parent branch and not at a preestablished clearing limit.

#### **5.7.2.2 Remote/rural environment**

##### **5.7.2.2.1 Climbing spurs**

Climbing spurs may be used when limbs are more than throw line distance apart, or when the bark is thick enough to prevent damage to the cambium, or there are no other practical means of climbing the tree.

##### **5.7.2.2.2 Remote locations**

Utilities must often maintain facilities/corridors at remote locations. In such locations, it may be appropriate to use mechanical pruning equipment.

##### **5.7.2.2.3 Mechanical pruning**

Cuts should be made close to the main stem, outside of the branch bark ridge and branch collar. Precautions should be taken to avoid stripping or tearing of bark or excessive wounding.

### **5.7.3 Emergency service restoration**

During a utility declared emergency, utilities must restore service as quickly as possible in accordance with ANSI Z133.1, 29 CFR 1910.331 – 335, 29 CFR 1910.268, or 29 CFR 1910.269. At such times it may be necessary, because of safety and the urgency of service restoration, to deviate from the use of proper pruning techniques as defined in this standard. Following the emergency, corrective pruning should be done as necessary.

## Appendix B

### Pruning Information



How to Prune Trees. USDA Forest Service, Northeastern Area State and Private Forestry. NA-FR-01-95.

Why Topping Hurts Trees. International Society of Arboriculture, 1997.

Guide To Proper Pruning: Natural Target Pruning – Hitting targets with your pruning cuts. Forest Health Notes, Nevada Division of Forestry.

Pruning Mature Trees. International Society of Arboriculture, 1998.

Pruning Young Trees. International Society of Arboriculture, 1997.



# Nevada Division of Forestry FOREST HEALTH NOTES

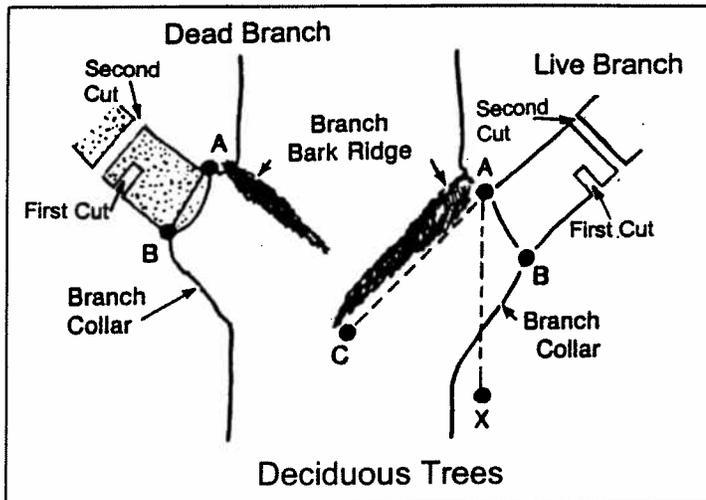
Information & Guidelines for Maintaining  
Healthy Trees and Forests

## GUIDE TO PROPER PRUNING

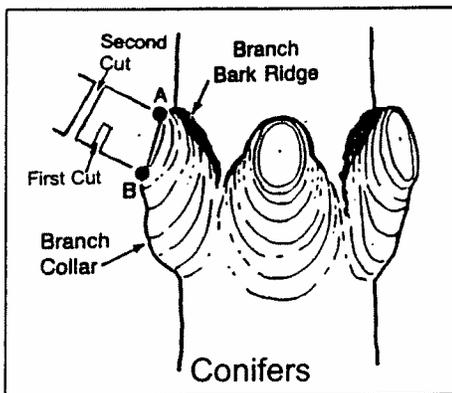
Natural Target Pruning: Hitting targets with your pruning cut.

### PRUNING STEPS

1. Locate the branch bark ridge.
2. Find TARGET A – just outside of the branch bark ridge.
3. Find TARGET B – swelling where branch meets branch collar.



4. If B is hard to find, drop a line A-X to form the angle C-A-X. Make a mirror image of the angle C-A-X to determine the angle X-A-B. Then make the cut at A-B.

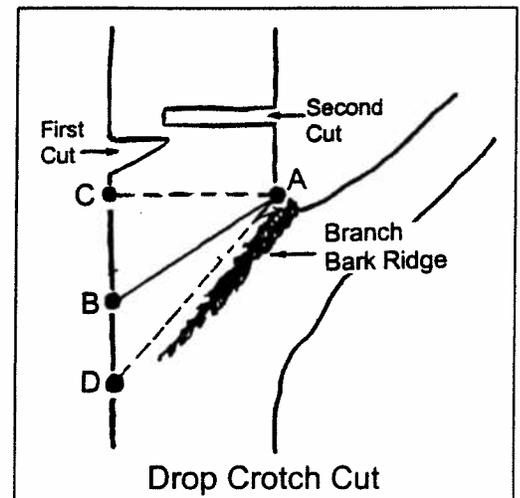


5. For two inch and larger limbs use the 'three-cut' method. Make a first cut on the underside of the branch, 8 to 10 inches from where the branch connects to the trunk. Cut 1/3 to 1/2 way through the limb.

Make the second cut from 1 to 3 inches further out from the first cut, starting on the top, and cutting through the branch. Make the final cut at line AB, just outside the branch collar.

**DROP CROTCH CUT** (deciduous trees only):  
Used to reduce the height of a tree by removing a main branch back to a smaller branch that is at least 1/3, and preferably 1/2, the diameter of the branch being removed.

1. Use the 'three-cut' method described in No. 5 above.
2. To determine where to make the final cut, draw an imaginary line AC perpendicular to the branch being removed.
3. Make cut at AB, the line that divides or bisects the angle between the perpendicular line AC, and the branch bark ridge, AD.



**DO NOT TOP TREES** or leave flat tops. (see illustration above)

**DO NOT** cut on the trunk side of the branch bark ridge, or into the branch collar. The branch collar determines the angle of the cut.

**DO NOT** leave stubs.

**DO NOT** paint or seal wounds or cuts.

## Appendix C

### Miscellaneous Tree Care Information

Recognizing Tree Hazards. International Society of Arboriculture, 1994.

Trees and Turf. International Society of Arboriculture, 1995.

Mature Tree Care. International Society of Arboriculture, 1995.

New Tree Planting. International Society of Arboriculture, 1995.

Tree Selection. International Society of Arboriculture, 1995.

Buying High-Quality Trees. International Society of Arboriculture, 1995.