

**2005
Rabbit Creek
Forest Health Protection Grant**

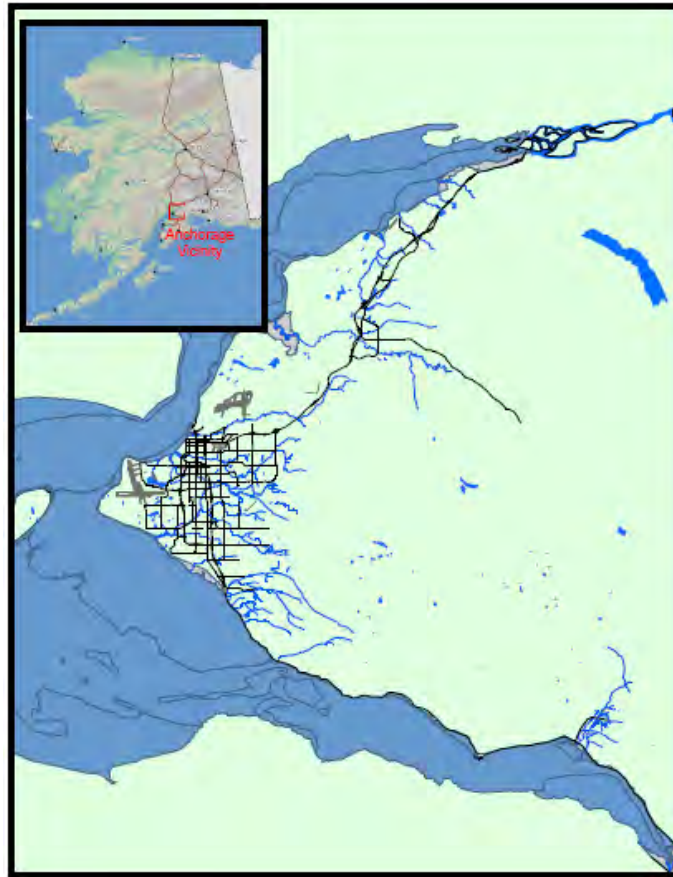
*FINAL REPORT
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*US Forest Service
R10-05-ANC009*



Anchorage Fire Department – Municipality of Anchorage

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The Anchorage Fire Department submitted an application to Region 10 on October 29, 2004 for a matching grant to support forest health in the Rabbit Creek drainage of Anchorage, Alaska. An award of \$100,000 was granted to AFD on September 14, 2005. This grant is to be matched at 75% by AFD. AFD has appropriated funds in the following manner:

DeptID 33516G	Project FHP6	\$100,000	Expended 09.01.05 – 08.06.07	\$100,000
DeptID 33516G	Project FHP5	\$200,000	Expended 09.01.05 – 08.06.07	\$200,000
DeptID 33525G	Reimbursable Match	\$100,000	Expended 09.01.06 – 08.06.07	\$100,000

Grant Summary

In 2004, AFD applied to the USFS Forest Health Protection program for a grant to treat 650 acres of spruce bark beetle impacted forests across the Rabbit Creek Drainage of the South Anchorage Hillside. The projected cost per acre for treatment, including tree removal, site preparation, pruning and planting was estimated to be \$600 per acre.

Under this grant, AFD treated 197 acres for the period September 2005 through September 2007 for \$390,433, at a rate of \$1,981 per acre. The match ratio for this grant was 75% AFD and 25% USFS FHP. In this drainage, AFD treated 199 acres of public land where 90 were supported by FHP. AFD treated approximately 220 acres of private land where 107 were supported by the FHP program for \$155,961. The cost for private land forest treatment is shared between AFD and the homeowner at a 70/30 ratio, respectively. Treatment acres were categorized into public lands labeled “neighborhood forest health treatment projects” and private lands labeled “private parcel cost share program.”

Project Area covers the South Anchorage Hillside of Anchorage, Alaska.



Spruce bark beetle activity reached epidemic levels in the mid 1990s. In the wake of the beetles, forest stand structure has changed dramatically. Both closed and open spruce stands have experienced an increase in grass cover (*Calamagrostis* spp.) along with substantial regeneration by spruce, hemlock and birch in some areas.

The Anchorage Fire Department (AFD) houses the Wildfire Mitigation Office charged with mitigating the effects of the spruce bark beetle with respect to catastrophic fire. Through partnerships with local, State and Federal agencies, AFD has expanded the benefit of treatment from fire mitigation only to incorporate forest health, soil & water conservation, protection from invasive species and support for forest resilience through stewardship of the land. AFD promotes land owner stewardship at all levels and includes forestry outreach in all fire education programs.

Taken in 2007, this image shows the extent to which the spruce bark beetle epidemic changed the ratio of live to dead trees. All of the grey trees have been killed by the bark beetle. The height of the epidemic was in 1996. Through research conducted by the USFS, it was shown that the expected time frame for beetle killed trees to fall is 5-10 years. Severe winds common to this area bring down many trees each year. Effectively, treatment through the forest health protection grant speeds up succession and ensures that the forest stand structure is restored to its pre-bark beetle epidemic condition through planting of trees and native grasses, and natural regeneration. The alternative is a potential shift from open and closed spruce stands to savannah type stands where spruce and birch are widely spaced and *Calamagrostis* spp. grass is the dominant understory cover species.



AFD focuses forest health treatment projects on private and public lands that are developed or adjacent to development. Residential neighborhoods receive technical and financial assistance with forest treatment projects on parcels up to 5 acres in size. Public lands are treated adjacent to subdivisions; these include properties owned by Municipal and State agencies.

AFD initiated the Anchorage Wildfire Program in 1998 as a response to the Miller's Reach Fire in the adjacent Matanuska Susitna Borough, also impacted by the spruce bark beetle. Treatments began in earnest in 2001 and are expected to continue through 2011, with a maintenance plan identified for future years.

Beyond the spruce bark beetle, forests within the Municipality of Anchorage are managed primarily for recreation, fish, wildlife and water quality. Minimal forest management activities have been conducted prior to the Anchorage Wildfire Program. This strategy resulted in dense stands of spruce that were susceptible to forest insects and disease as they matured.



Forsythe Park was once a closed mixed stand of white spruce, black spruce and birch. The site prescription for treatment called to cut all dead spruce, thin live spruce to 12-15 foot spacing and prune residual spruce to reduce the potential for future bark beetle activity and to increase vigor. Through this prescription, more light was allowed to reach regenerating seedlings. To limit the density of *Calamagrostis* spp. grass, all scarified sites were planted to a native fescue and bluegrass. These alternative species do not form as thick of a root mat thereby allowing for the regeneration of trees, shrubs and herbs on the site.

In its entirety, all 26 acres of Forsythe Park were treated in 2007 by the Anchorage Fire Department. It was not funded by the 2005 Forest Health Protection grant for Rabbit Creek, but it is located within that drainage. This treatment supports the objectives of the FHP grant through improved regeneration and limiting the spread of invasive weeds through planting grass.



This image was taken in 2007 showing where a fuel treatment project was conducted on MOA Park land directly adjacent to a subdivision. Not all private land owners are willing to foster forest treatment activities on their property. The MOA assumes the responsibility of managing for forest health and fire on its land with a priority for those parcels directly adjacent to homes and other high value resources.

This project is called the Hilltop Shaded Fuel Break. The treatment was conducted in 2003 – 2005 and involved the removal of spruce bark beetle killed trees and thinning the residual trees. The remaining forest cover was primarily birch. Through treatment, the ground was scarified by the skidder and slash burn piles. These sites show how the *Calamagrostis* spp. grass invades scarified sites along with the regeneration of other forest herbs and shrubs common to the area. This project, one of the first in the Anchorage Wildfire Program demonstrated the need for improved treatment guidelines with respect to planting trees and native fescue grass to reduce the density of *Calamagrostis* spp. grass. The resulting cover in treated sites under the 2005 Rabbit Creek Forest Health Protection Grant is improved regeneration of native spruce and birch, greater cover of forest herbs and shrubs, and improved restoration of the site to the intended forest stand structure for Municipal and State lands.

I. Neighborhood forest health treatment projects – 90 acres - \$234,472

The general forest treatment project prescriptions were to cut the dead and dying spruce bark beetle killed trees, thin out dense stands of spruce to leave mature, healthy trees and small patches of healthy regenerating trees. Many sites supported vigorous natural regeneration. Where extensive thinning took place due to the severity of the bark beetle impacts, spruce seedlings and native grasses were planted.

A. Hanshew-Springhill Schools & Ruth Arcand Park – 15 acres - \$43,867

Part of a 35-acre project, the Rabbit Creek FHP grant covered 15 acres of treatment at a rate of \$2,924/acre. This project was completed by Fuels Reduction of Alaska (FRA) using an in-woods mower accompanied by a small excavator and forwarder. These tracked machines leave a light footprint on the land and are maneuverable on slopes and between trees. All dead and dying spruce bark beetle affected trees were removed. Live spruce trees were thinned to 20-25 foot spacing for white spruce and 5-8 foot diameter clumps for black spruce. All residual spruce trees were pruned. Logs were forwarded to the parking lot and used by local residents for firewood. The slash was mulched in the woods, adding the nutrient value back into the soil. After treatment during the winter and spring of 2007, the site was planted with native grass (Arctared red fescue and Alpine bluegrass) and white spruce seedlings.

The treatment was conducted around the school grounds of Hanshew Middle School and Springhill Elementary School, in addition to several acres of Ruth Arcand park land. These schools share Section 16 with the Ruth Arcand Equestrian Park and the O'Malley golf course. About 60% of this section is forested with many stands affected by the spruce bark beetle. Little Campbell Creek bisects this section and is a tributary to Campbell Creek, an anadromous stream.



The mixed hardwood forest surrounding Hanshew – Springhill schools maintained a high percentage of young, healthy birch after treatment. Substantial natural regeneration is occurring on the site in addition to the planted white spruce and fescue grass.

2007 Hanshew-Springhill Project 35 Acres



A. Bear Valley Section 36 – 44 acres - \$104,260

AFD has worked on several contiguous areas within Section 36 during the past seven years. This section is managed by the Municipal Parks & Recreation Department. It forms the headwaters of Little Rabbit Creek, an anadromous stream, and is a major wildlife corridor for moose, bear and other wildlife. The site consists of mature white, Lutz and black spruce that experienced approximately 80% mortality from the spruce bark beetle. Regenerating seedlings and saplings are vibrant. Carpenter ants and red belt fungus followed the bark beetle infestation and resulted in a high incident of wind throw throughout the site. From 2002 through 2007, AFD has treated 107 acres of forest land in this section, 44 acres apply to the 2005 Rabbit Creek Forest Health Protection grant.

1) *Alascom Tower – 2 acres - \$4,600*

This 2-acre project is located in the northwest corner of Section 36. The southern exposure has been highly impacted by the spruce bark beetle. The residual stand is mature birch with several pockets of hemlock and spruce. The resulting overstory is primarily birch. In other similar areas, birch regeneration has been substantial. Calamagrostis spp. grass has grown in on the masticated areas with regenerating birch and other shrubs taking hold in patches. This project was completed by Fuels Reduction of Alaska using mechanized slash processing.

2) *Jaime Road – 12 acres - \$28,300*

The total treatment area covered 40 acres, 12 of which are applied to the Rabbit Creek FHP grant. Treatment work was conducted by the State Division of Forestry (DOF) Technicians and Pioneer Peak Crew. Dead trees were felled, bucked and limbed. Live trees were thinned to 15-20 feet. The residual slash was burned on site. Residual spruce and hemlock trees were pruned. Groups of regenerating spruce and hemlock were left on site in clumps to provide shade and cover for wildlife. Regeneration on the site supports both spruce and hemlock; no planting was done.

3) *Clark's Road – 30 acres - \$71,360 (FRA \$34,560 & DOF \$36,800)*

This project was a joint effort between Fuels Reduction of Alaska and State Division of Forestry crews. In dry areas, FRA moved easily with the tracked equipment. On the moist sites, DOF burned slash to avoid rutting and subsequent erosion. This site consisted mostly of large diameter white spruce, standing and fallen, killed by the spruce bark beetle. The understory was mostly alder and shrubs. After treatment, native grass and white spruce seedlings were planted in the masticated sites. Calamagrostis spp. grass did take over portions of the site. The residual trees are mostly birch with patches of alder, willow and several spruce-hemlock clumps. Residual trees were pruned.

Bear Valley Forest Health Treatment



Section 36 – Clark's Road

This image shows the wide spacing of spruce and hemlock on the south facing slope of Section 36. Most of the spruce were killed by the spruce bark beetle, leaving skeletal remains amid patches of vibrant hemlock and regenerating spruce seedlings. The understory was a strong mix of shade intolerant shrubs and Calamagrostis spp. grass. Through treatment, mastication of spruce limbs into the top layer of soil created a suitable bed for planting fescue, bluegrass and white spruce. Additionally, hemlock and birch seedlings have made a claim to this site.

Section 36 – Clark's Road

The mechanized treatment leaves scarified skid trails and areas where spruce trees have been "mulched" or "mowed" into the top layer of soil. In some sections, slash was burned to limit using equipment where the soil was saturated. Planting these areas to fescue, bluegrass and white spruce seedlings provides the additional benefit of limiting the potential for invasive weeds to germinate in the treatment area.



Bear Valley – Mechanized and Manual Forest Treatment

Section 36 – Clark’s Road

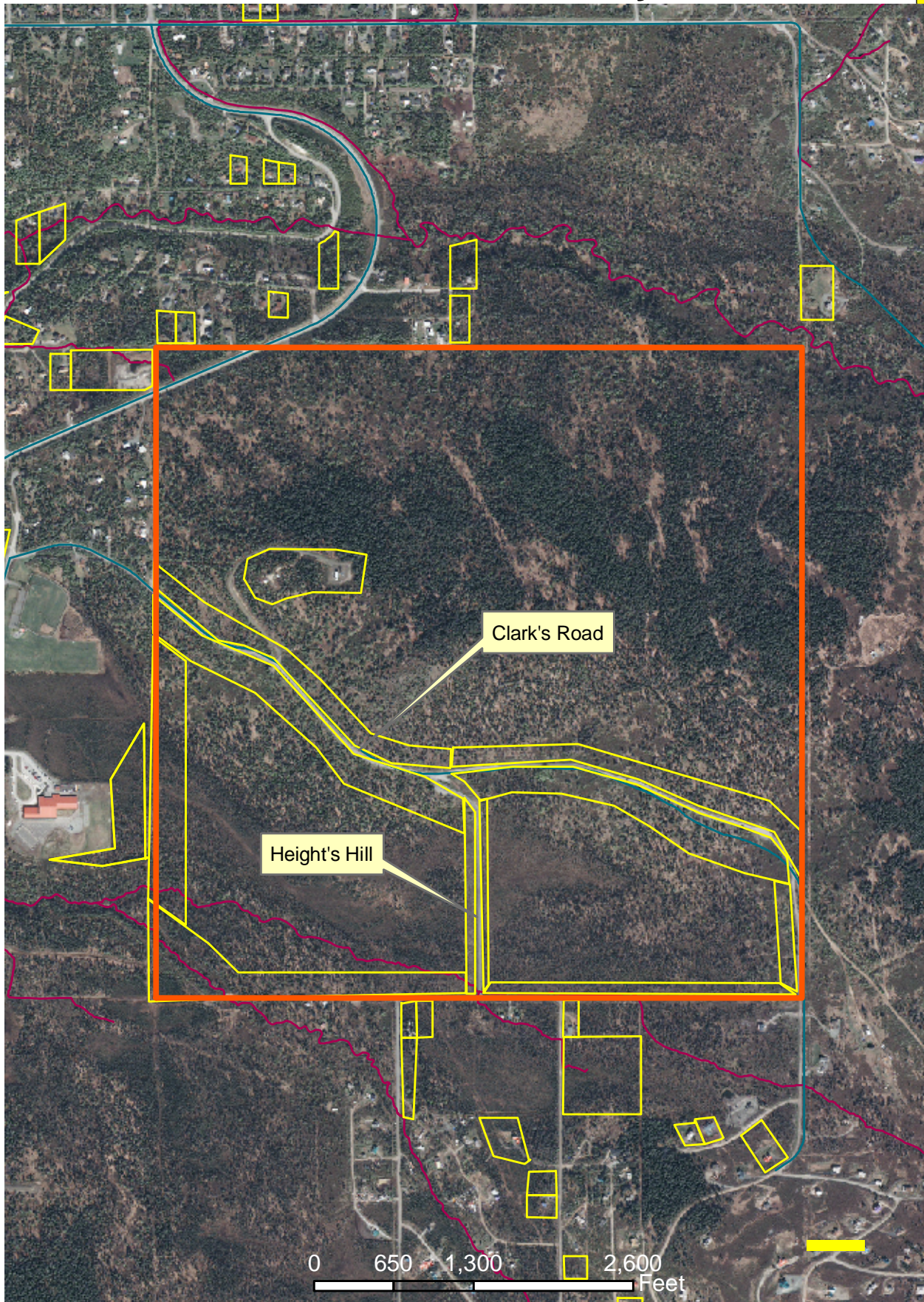
Division of Forestry Technicians and Pioneer Peak Hot Shots treated the dead spruce on the ground manually with chainsaws and slash pile burns where the soils were saturated.



Section 36 – Clark’s Road

Fuels Reduction of Alaska, a small company based in Wasilla, Alaska, uses an in-woods mower and a small excavator to treat forested areas.

2001-2007 Forest Treatment Projects Section 36 Bear Valley



A. Old Rabbit Creek Park – 10 acres - \$30,700

Old Rabbit Creek Park, covering 92 acres of a primary drainage in South Anchorage, is managed by Municipal Parks & Recreation. The park serves as a major wildlife corridor for brown bear, black bear, and moose while it also surrounds a portion of Rabbit Creek, an anadromous salmon stream.

This project treated 10 acres in the eastern portion of the park near homes along Prator Street connecting to Old Rabbit Creek Road. The project was completed by DOF in fall 2006 and planted in spring of 2007. The site consisted of white spruce that experienced about 60% mortality from spruce bark beetles. Regenerating seedlings were present during and after treatment.

The treatment removed 95% of dead spruce trees along the trail. Hand falling was sometimes challenging on the steep slopes. Understory vegetation includes wild rose, alder, elderberry and Devil's club. Slash piles were burned, including much of the larger woody material. Regeneration is vibrant on this site. AFD augmented tree stocking by planting white spruce. The burn piles were seeded to native grass.



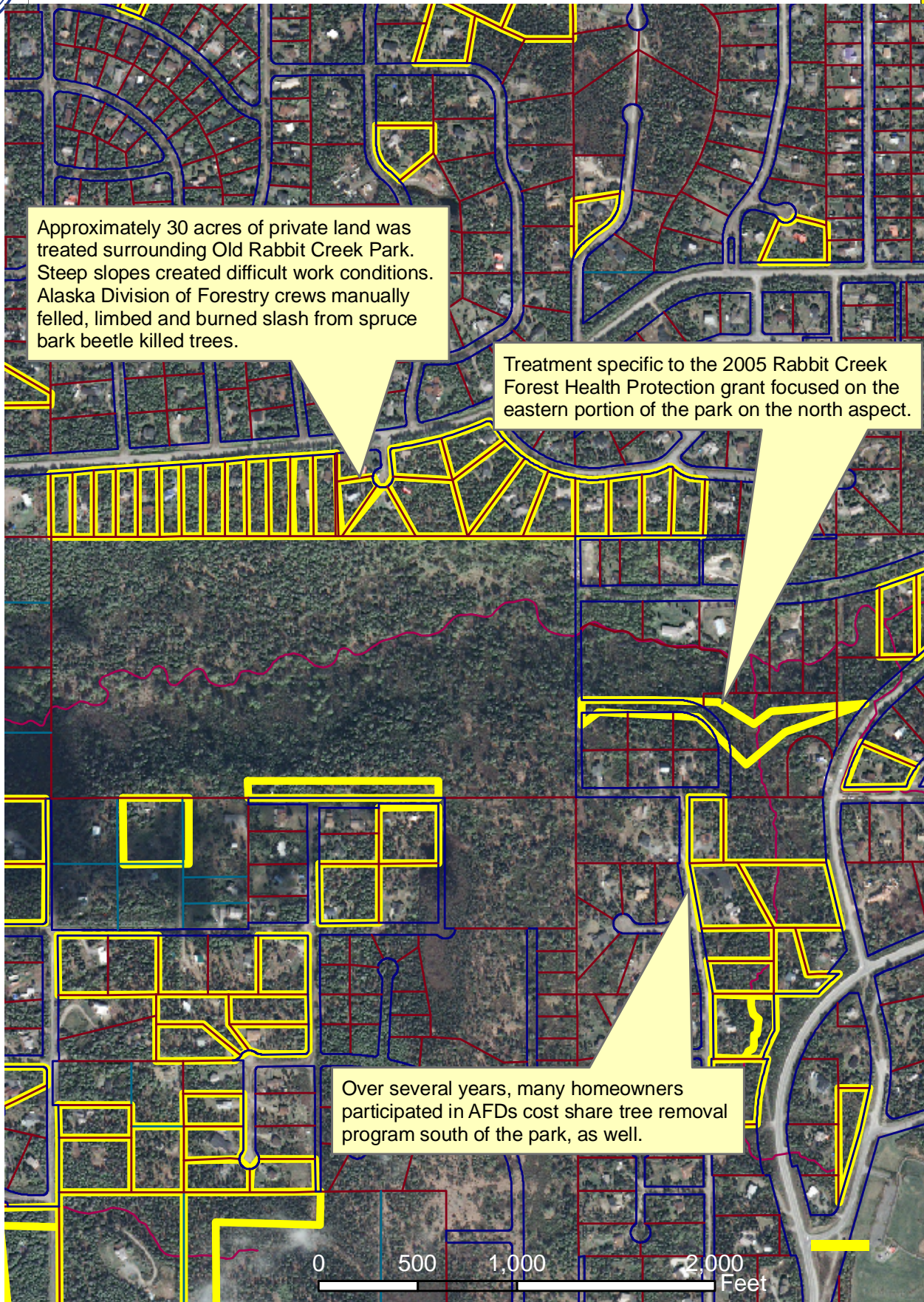
Spruce trees growing on the steep slopes along the Rabbit Creek drainage were suffered severe mortality from the spruce bark beetle. Manual felling and burning of these mature trees provided room for regeneration of birch and spruce seedlings. Native grasses were planted in the burn sites. White spruce trees were planted along this stretch of trail.

Between 2004 and 2006, many homeowners participated in the Anchorage Wildfire Program along this drainage. Approximately 30 acres of private land was treated surrounding this park. A few of those parcels were treated under the 2005 Rabbit Creek Forest Health Protection grant. The resulting forest stand structure supports vibrant spruce seedlings and saplings along with a selection of mature spruce that survived the bark beetle epidemic. Birch, alder and elderberry are dominant in the area.





Old Rabbit Creek Park Forest Health Protection





Similar to many forest treatment projects, firewood is available for homeowners if the logs can be located in an accessible site without damaging the vegetation.

A. South Anchorage High School – 14 acres - \$28,350

Newly developed on Elmore Road, between DeArmoun and Huffman Roads, the South Anchorage High School grounds were heavily impacted by the spruce bark beetle. This parcel is located within a residential neighborhood and the trails within are used by school children as well as local residents and wildlife. After completion of the school and its landscaping, AFD treated the forested perimeter. Residual spruce and birch still provide substantial shading on the forest floor. Calamagrostis spp. grass has covered the skid trails, but undisturbed areas retain native forest vegetation. The project was completed by FRA.

B. Hillside Park Homeowner’s Association - 7 acres - \$27,295

This greenbelt winds between homes in the subdivision near O’Malley and Hillside. FRA completed the tree work during the winter of 2006 with mechanized processing. The dead and dying spruce beetle killed trees were removed. Slash was mowed in the woods. The residual mature spruce and hemlock were pruned to stave off a future beetle attack. Small pockets of regenerating conifers were left on site.

Homeowners in this area have practiced conscientious backyard stewardship in taking care of their spruce trees and removing bark beetle killed trees. The greenbelt provides wildlife habitat for moose and song birds. Typical of the Anchorage hillside, the mixed conifer overstory provides good seed trees for spruce and birch regeneration.



South Anchorage High School Rabbit Creek Forest Health Protection



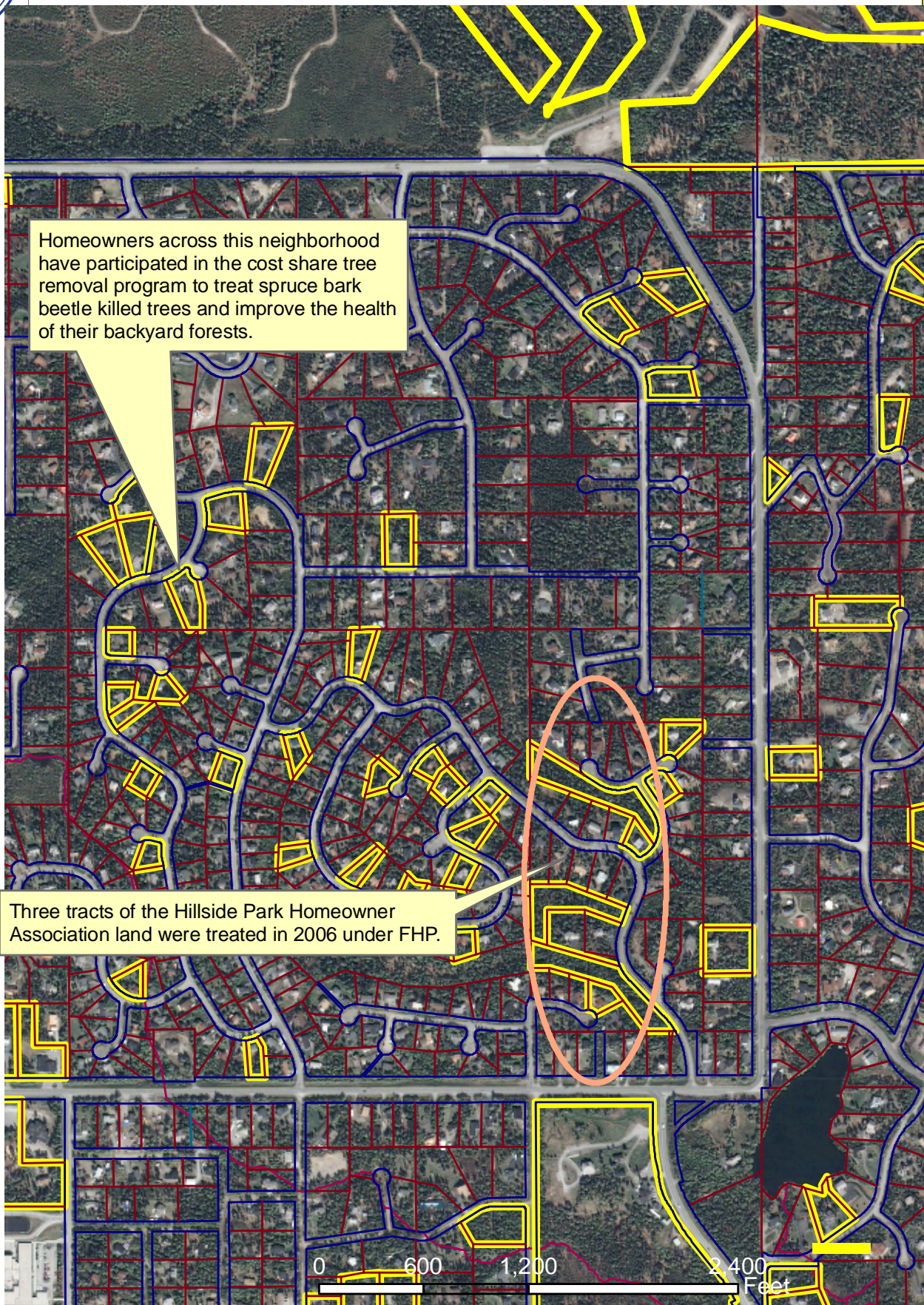


Hillside Park Homeowner's Association Rabbit Creek Forest Health Protection



Homeowners across this neighborhood have participated in the cost share tree removal program to treat spruce bark beetle killed trees and improve the health of their backyard forests.

Three tracts of the Hillside Park Homeowner Association land were treated in 2006 under FHP.



II. Private parcel cost share program – 107 acres - \$155,961

Individual site assessments were conducted on 85 private parcels. Through the cost share program, home owners received a site prescription from AFD with recommendations for tree removal and vegetation management to improve forest health. In total, 107.31 acres were treated for a cost of \$213,100.55 by private tree service companies. Of that amount, AFD reimbursed \$155,961.48 back to the home owners on behalf of the Rabbit Creek Healthy Forest Project. All homeowners received information on controlling invasive plants: spotted knapweed, Canada thistle, orange hawkweed.

III. White spruce seedlings – 5,000 - \$4,167

AFD purchased 5,000 white spruce seedlings from the local Cook Inlet Chapter of the Society of American Foresters for \$4,166.67. AFD gave the seedlings out to agencies and landowners to plant in the area. An additional 1,000 seedlings were purchased but not charged to this grant. These seedlings were also planted on Rabbit Creek FHP projects.

IV. Indirect at 5.4% - \$5,400

The indirect grant management rate for the Municipality of Anchorage that applies to this grant is 5.4%.

Conclusion

AFD treated 197.3 acres for \$390,433 in the Rabbit Creek drainage of the Municipality of Anchorage under the 2005 Forest Health Protection grant. The actual cost of forest treatment exceeded the estimated amount as written in the grant application. AFD originally planned to treat 650 acres. While the completed work did not meet the expected total acres treated for the estimated cost, the value of the work is high and has substantially improved the forest health in the area. Additional acres have been treated in this drainage with funding outside of this grant.

Since 2001, AFD has worked with hundreds of private land owners and across large acreages of public lands to support forest health in the wake of the spruce bark beetle epidemic. While the premise of this program targets wildland fire mitigation, the forest health benefits derived from this treatment support the resilience and regeneration of forests in the urban center of Alaska. The large parks and open spaces covering thousands of acres on the South Anchorage Hillside, including the entire Rabbit Creek drainage, support a significant population of moose, bear, lynx, song birds and maintain the quality of many anadromous salmon streams. Additionally, the aesthetic quality of this area contributes to the Alaskan lifestyle in the urban area of Anchorage.