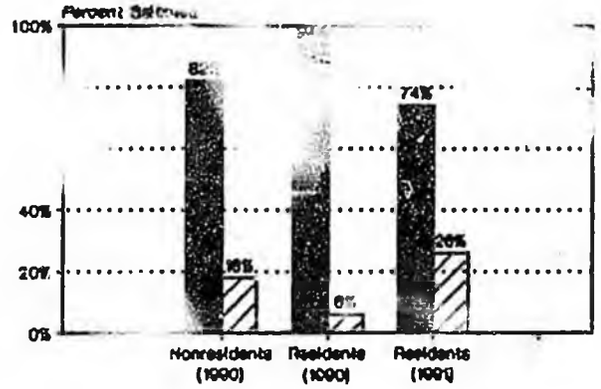
ALASKA LEGISLATURE COMMITTEE FILES 1993-1994 8672

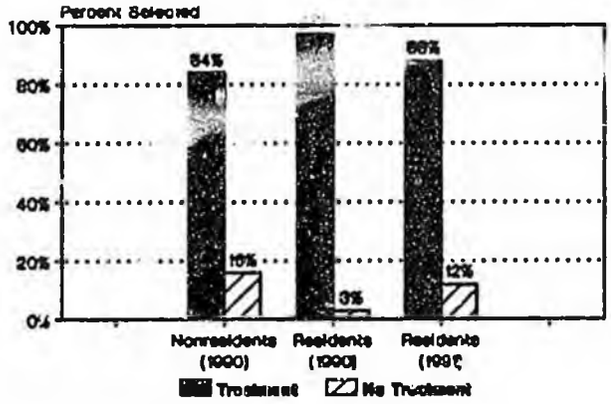
7991 HOUSE RESOURCES

256

ferred Future Forest Conditions
e./Snug Harbor

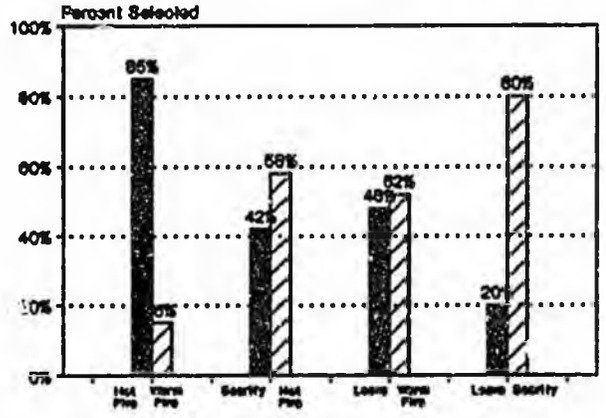


Kenai River/Schooner Bend (Retrosp.)



AK90 NR n=70 R n=45 AK91 n=109

Kenai Lake/Snug Harbor (1991)



AK91 H/W & L/S n=110 S/H n=49 L/W n=61

alternative forest restoration options, following a clearcut of the dead spruce, revealed that the strongest preference was for the *very hot fire* option (where felled dead trees were left to burn). The second most preferred option was *mechanical scarification*, followed closely by *moderately hot fire* (felled trees removed before burning), which was only slightly favored over the no-treatment *leave* option. For the one exploratory near-view scene, the *thinning protection* treatment was consistently preferred over the *no treatment* option.

Summary

The expressed preferences among the four-scene scenarios were consistent with the results of the single-scene assessments. The retrospective simulation of *thinning* spruce prior to infestation was rated higher and chosen more often than the *no treatment* option which resulted in large numbers of dead spruce. The individual scene ratings and choices among alternative restoration scenarios indicated a clear preference for *treatment* options that accelerated the recovery of forest cover, especially those, such as *hot fire* and *mechanical scarification*, that restored a significant cover of spruce. In short, respondents preferred to keep forests green if possible and, when significant numbers of trees were already dead, they preferred scenarios that featured faster recovery of forest cover, especially spruce.

An Important Caveat

While the results of the perceptual assessment were quite clear, it is important to acknowledge two important limitations on their interpretation. First, the "future forest conditions" represented in the computer simulations were based on the best available forest data and expert consensus regarding the most likely outcomes of the management alternatives considered. Still, human ability to predict complex biological processes is significantly limited, and many important factors (such as climate variations, wildfires, etc) can neither be predicted nor controlled. It follows that the specific details of the conditions depicted in the simulations represent "average" conditions based on the experts' "best estimates," and should not be viewed as absolutely certain outcomes.

Finally, the perceptual assessments pertain only to expressed preferences for the *visual* outcomes of the alternative management options evaluated. Many important issues, such as the economic costs of achieving the outcomes and the environmental consequences associated with each, cannot be directly represented by visual simulations, and these factors undoubtedly have significant effects on public reactions to forest management actions. Some of these non-visual issues were more directly addressed in the verbal portion of the assessment, described below.

ACCEPTABILITY OF ALTERNATIVE MANAGEMENT POLICIES

Following the forced-choice evaluations of alternative future forest conditions, some of the respondents in the 1990 study and all of the 1991 respondents answered questions about bark beetle-related forest management policies. Issues addressed in this part of the assessment were identified through individual interviews with forest and pest management specialists in the US, State and local Bureau forest management agencies, local residents,

tourist facility operators and recreators and tourists visiting facilities in the study area. The specific statements and format for the assessment were evaluated and refined in a pilot test on a sub-set of the 1990 respondents.

The management policy section of the assessment was introduced by a general description of the life cycle of the spruce bark beetle and how it attacks and kills trees. The outbreak on the Kenai Peninsula was described, including an oblique aerial photograph of a severely affected area just north of the Kenai River near Cooper Landing.

The policy assessment was divided into five sections, each preceded by a brief description. Individual sections included questions pertaining to the acceptability of management policies in different contexts, including:

1. **general policies** regarding whether to allow the outbreak to follow its natural course or to actively try to stop it;

2. **prevention** of the conditions that may lead to outbreaks;

3. **protection** of trees in threatened areas once an outbreak is already underway;

4. **restoration** of forest areas that have already been severely affected by an outbreak; and

5. questions pertaining to **expectations** regarding the future spread of the current Kenai Peninsula outbreak.

A copy of the complete assessment instrument, including introductory information and instructions is provided in the attatched Appendix to this report.

General Policies

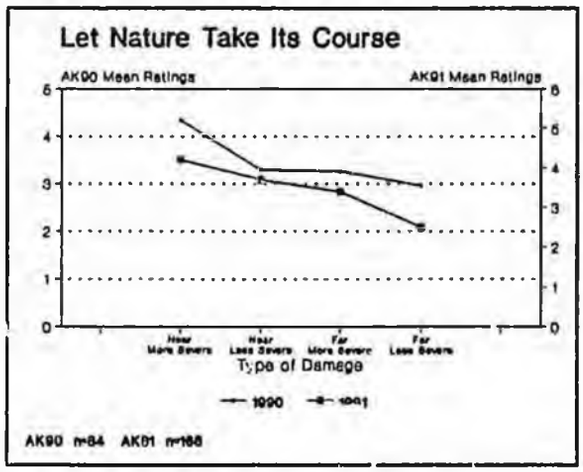
This section sought to determine in general the circumstances under which respondents would favor not taking any explicit management action in response to the bark beetle infestation. The introductory statement for this section was:

One response to the spruce bark beetle outbreak is to accept it as a natural process and just "let nature take its course." In remote areas this may be the only possible response. In some Parks and Wilderness Areas it may be the only alternative allowed by law. Where managers have a choice, the best policy is to let nature take its course, so long as the area is:

Four situations were described which differed in the severity of the beetles' effects on the forest and where the effects occurred relative to human developments. *More severe* effects were represented as areas where most of the spruce trees would be killed and "only grass and brush is expected to grow back." *Less severe* effects specified less tree mortality and that "new trees are expected eventually to grow back." The location of the effects was described as *near* or *far away* from homes and recreation areas.

For both residents and visitors in the 1990 study, and for the residents in the 1991 study, the greatest willingness to **let nature take its course** was for areas described as *far away* from developments where damage was described as *less severe*. There was split agreement and disagreement for this policy in *far away/more severe* and *near/less severe* conditions. The majority of respondents disagreed strongly with the **let nature take its course** policy for areas *near* developments

where damage was described as *more severe*.



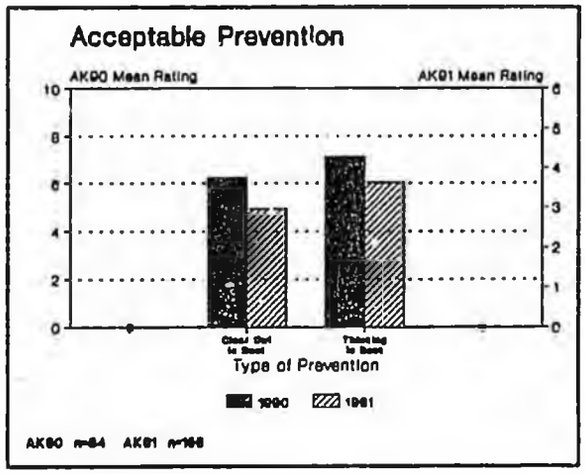
Prevention Before an Outbreak

This section focussed upon actions that might be taken in forest areas that are not currently infested, but are threatened by bark beetle infestation. In particular, this section addressed the acceptability of vegetation management options, such as thinning or clear cutting susceptible spruce stands.

The text that introduced this section was:

One method for protecting forest areas that are threatened by the bark beetle outbreak is to remove about half of the trees. This is intended to reduce the number of places for the beetles to breed and to help the remaining trees grow more vigorously so that they are better able to resist beetle attacks.

There was substantial agreement that removing some trees (about 50%) is an effective and acceptable method for protecting threatened stands. Consistent with the Alaska State survey, residents in both the 1990 and 1991 studies indicated that *thinning* was the most preferred method for tree removal. In both studies there was generally less agreement with *clear cutting small patches*, though about 22% of the 1990 resident sample rated this option as "completely acceptable," and 15% of the 1991 sample "strongly agreed" with this approach.



Respondents in the 1991 study agreed that *cut trees should be sold to private companies*, and that cutting and revegetation treatments should be implemented even if *selling the trees will only pay for part of the costs*.

Protection During an Outbreak

The focus of this section was on forest areas currently involved in an active bark beetle infestation. Based on available pest management options in these circumstances, the only management alternative offered was to spray insecticides. The questions posed addressed the particular conditions under which various spraying policies would be approved.

The introductory statement was:

During a bark beetle outbreak it is possible to protect selected trees by spraying environmentally approved insecticides directly on the bark. Spraying costs about 5 to 10 dollars per tree and lasts for up to three years.

The use of insecticides, even when presented as "environmentally approved," produced very divided responses. The 1990 study yielded a pattern of widely split opinion, with slightly more residents finding insecticide spraying "completely acceptable" (21%) as compared to "completely unacceptable" (14%). Visitors showed a much stronger pattern for this question, with only 2% indicating completely acceptable and 30% completely unacceptable. In the 1991 study 44% strongly or moderately agreed vs 30% strongly or moderately disagreeing that insecticides *are perfectly safe for use around homes and recreation areas*; the middle 25% tended more to mild agreement.

Interestingly, the Alaska State survey found a pattern of greater acceptability for *encouraging property owners to use insecticides* the farther the respondent was from the affected sites; there was 65% approval by residents in the affected areas, 72% by residents of other (unaffected) Kenai Peninsula areas, and 80% by Anchorage residents. At the same time, only 39% of Kenai residents favored the use (by the State) of insecticides to protect trees in campgrounds. The indication is that insecticide use evokes strong reactions, and involves more than one dimension of public concern.

The more detailed pattern of responses provided by the 1991 study indicated that insecticides were generally accepted as the most effective protection method. Defining "agreement" as a rating of 1 through 4, and "disagreement" as ratings 7 through 10), a larger proportion (47%) of 1991 respondents agreed that *spraying insecticides is the best way to protect large trees*, with 36% disagreeing. Only 22% agreed that spraying makes trees *essentially 100% safe from bark beetle attack* vs 42% who disagreed. Objections to insecticides were based on their potential harm to *other insects and animals* (40% vs 30%) and because they are *potentially dangerous to humans* (42% vs 30%). At the same time 57% indicated they would be *willing to use environmentally approved insecticides to protect important trees near your home* as apposed to 31% who would not.

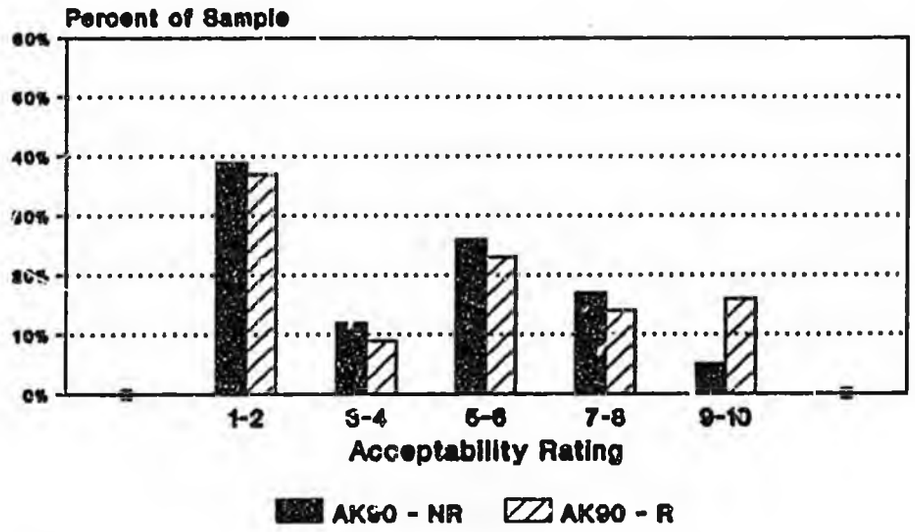
Restoration After an Outbreak

For many parts of the Kenai Peninsula the primary concerns are no longer prevention or even protection, but restoration of large areas of forest already severely affected by the bark beetle infestation. The introduction to this section of the policy assessment stated:

After a major beetle outbreak, a primary concern for forest areas that are frequently visited or seen by people is with how to treat the large areas of dead trees. Often more than 90% of the spruce trees are dead. New spruce trees need bare soil and sunlight to get started, and they need protection against competing grasses and brush for the first few years. The best treatment for beetle-affected forest areas is:

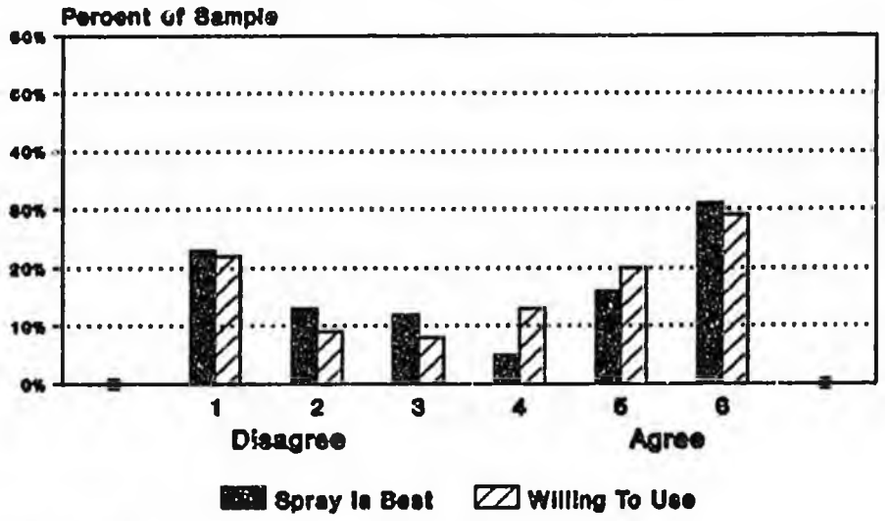
Options offered in this context included methods of dealing with the large numbers of dead trees (*leaving the forest undisturbed*,

Protection During An Outbreak
1990 Sample



R n=84 NR n=67

Protection During An Outbreak
1991 Sample



AK91 n=166

cutting and leaving or *cutting and removing* the dead trees), and with alternative methods of regenerating the forest. Alternatives for getting new trees to grow on affected sites primarily involved reducing competition from grass and brush by use of fire, *very hot* or *moderately hot*, *scraping the ground bare in some areas* (mechanical scarification) or *applying environmentally approved herbicides*.

In the 1991 study there was strong support for "doing something," as apposed to leaving bark beetle affected areas untreated. Less than 1% strongly agreed with a policy of *leaving the forest undisturbed, and allowing it to recover as best it can*. This result is consistent with responses to the *allow nature to take its course* options in the 1990 study and as repeated in the General Policy section of the 1991 study, where treatment of severely damaged areas near developments was consistently strongly favored. *Cut, remove and burn* was the most popular restoration option for Alaska residents in both the 1990 and 1991 studies. In response to a similar set of options, 77% of Kenai Peninsula residents participating in the Alaska State survey favored *cutting and removing the dead trees*, and 67% favored *cutting, burning and revegetating damaged areas along highways*, compared to 29% favoring *leave them as is*.

For areas near homes only 13% of Kenai residents favored the leave as is option. Thus, residents in all three studies generally favored cut and burn options for rehabilitating stands, especially when the trees are removed prior to the burn. Danger of wildfire was not a sufficient reason to preclude burning for most 1991 respondents, 47% disagreed with the policy that burning *should not be allowed because of the danger of starting wildfires* vs 31% who agreed.

Reactions to the herbicide options, like those to insecticide spraying, were widely split with about as many strongly agreeing as strongly disagreeing. In the State survey respondents preferred scraping or the use of mats (an option not offered in either the 1990 or 1991 studies) over chemical treatment (herbicide), whether used with or without fire. Only 23% of 1991 respondents agreed that the side effects of burning *have as bad an effect on the environment as herbicides*, while 44% disagreed. There was, however, a strong split in opinion regarding a complete prohibition against the use of herbicides; 26% of respondents strongly agreed that *herbicides should not be used under any circumstances*, matched by another 26% who strongly disagreed with that prohibition.

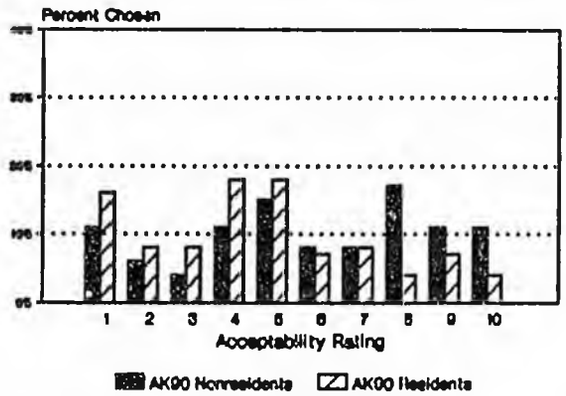
Expectations

This final section of the policy acceptability assessment addressed expectations for the future spread of the bark beetle outbreak. The goal of this section was to determine the extent to which respondents perceived the outbreak as a continuing threat, and whether they believed it might have serious consequences for their own communities. The context for this part of the assessment was set by:

The spruce bark beetle outbreak has now affected over 200,000 acres on the Kenai Peninsula. Biological surveys indicate that the outbreak may be continuing to spread.

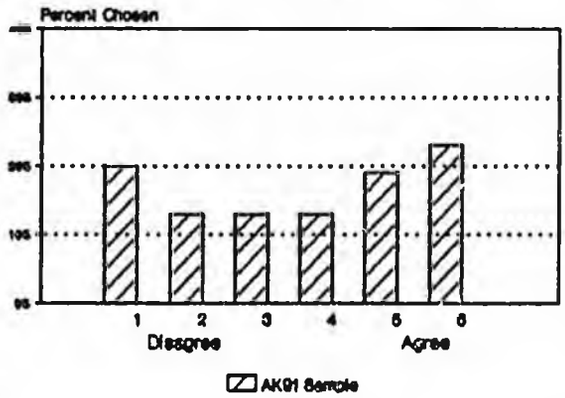
Three statements that followed addressed the likelihood of the outbreak spreading to *other areas on the Kenai Peninsula, to the area where you live* and the expected severity of effects should the outbreak spread, *you would not expect more than half of the spruce trees to be lost.*

Restoration - Cut/Leave/Burn - 1990



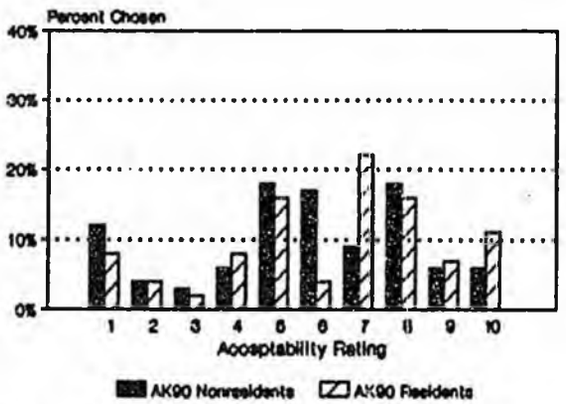
NR n=66 R n=44

Restoration - Cut/Burn - 1991



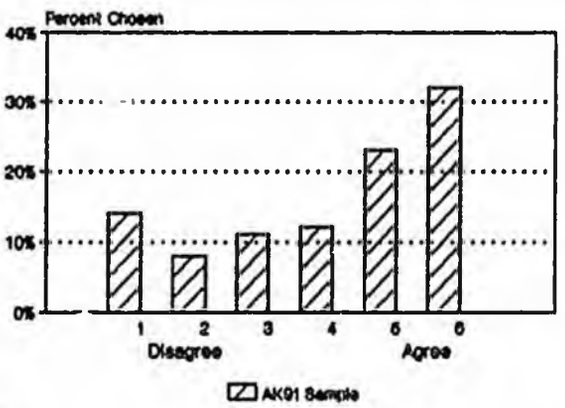
n=79

Restoration - Cut/Remove/Burn - 1990



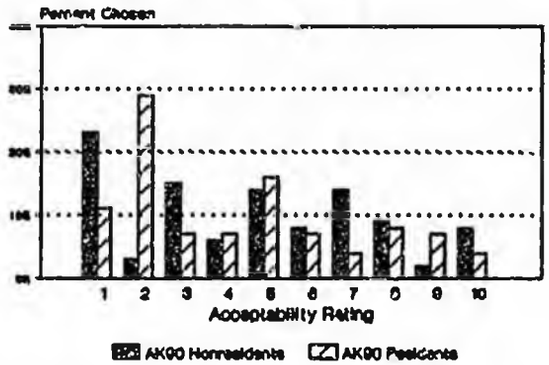
R n=45 NR n=66

Restoration - Cut/Remove/Burn - 1991



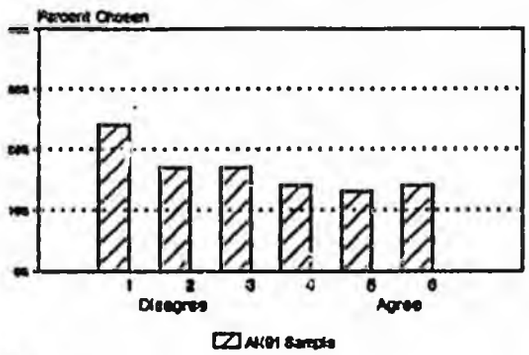
n=73

Restoration - Cut/Scrape - 1990



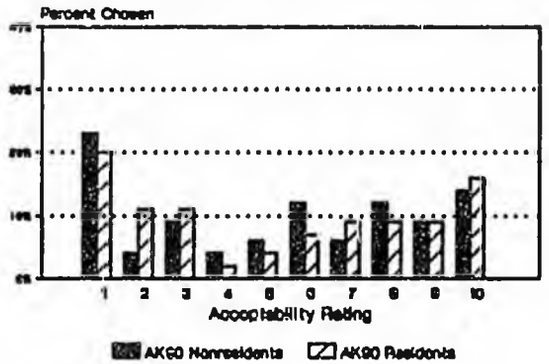
R n=45 NR n=66

Restoration - Cut/Scrape - 1991



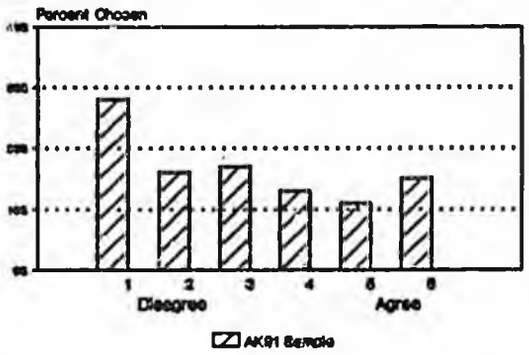
n=66

Restoration - Cut/Herbicide - 1990



R n=44 NR n=60

Restoration - Cut/Herbicide - 1991

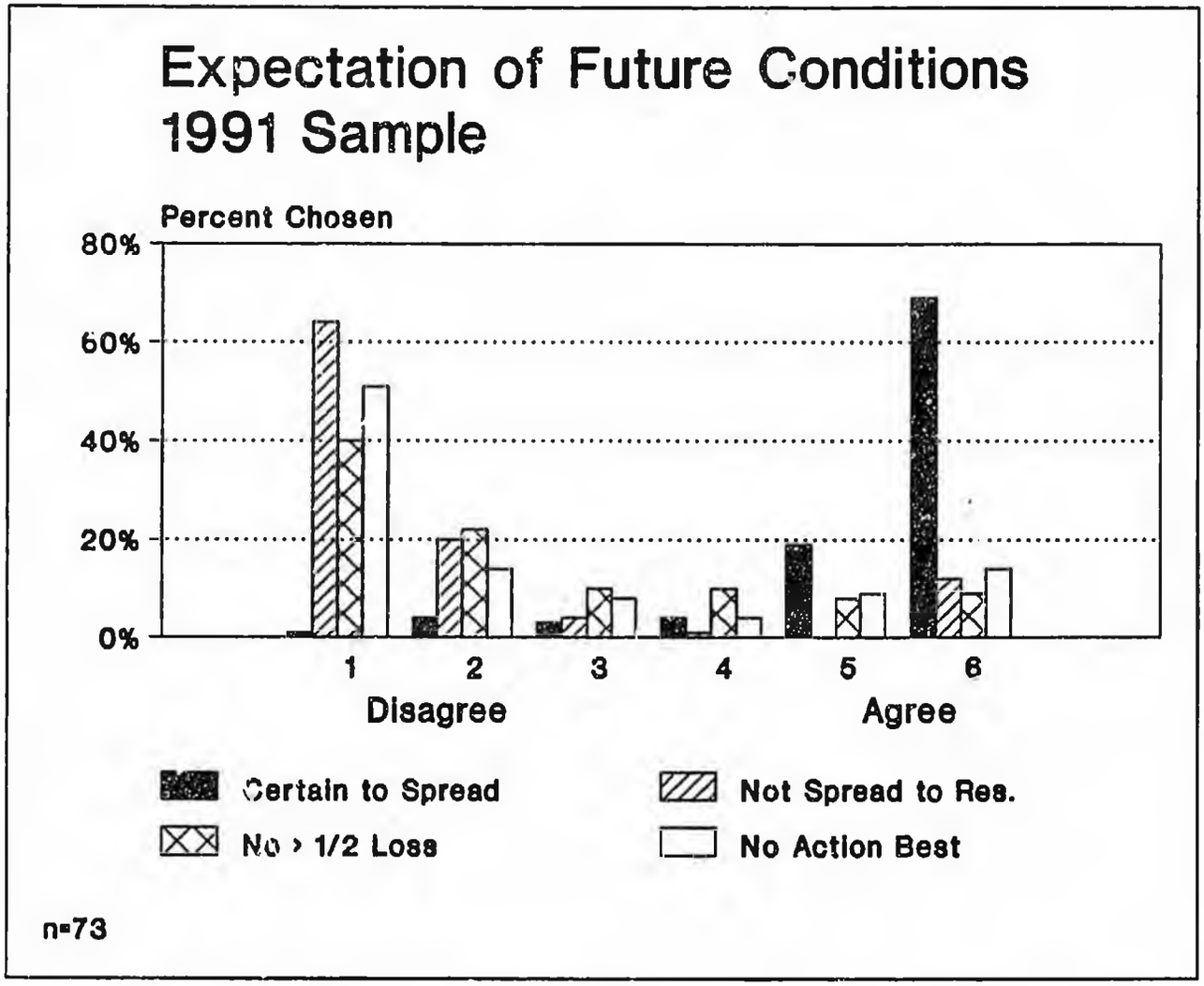


n=76

Restoration - Leave Undisturbed - 1991

n=76

The residents sampled in the 1991 study were quite certain that the outbreak *will continue to spread* (89% agreed), that it *will spread to their own properties* (83%), and that substantial damage will result when it does spread to their area; 62% agreed that *at least half of spruce trees will die* in affected areas.



The final statement in the assessment attempted to reach the "bottom line:" *All things considered, you would rather allow most of the spruce trees in your area to be killed by bark beetles than to have the forest treated by cutting and spraying insecticides.*

Overall, 66% of the residents sampled in 1991 disagreed with the policy indicated by this statement.

Summary

A number of consistent policy preferences emerged across the two studies reported. First, there was agreement that some

management intervention is preferable to "letting nature take its course," especially for areas near developments when damage is severe. The most preferred ***prevention*** treatment was *thinning* (about 50%) stands in threatened areas, with *clear cutting small patches* garnering less support.

The only ***protection*** option offered was spraying approved insecticides, which produced strongly divided responses. The majority of residents in both the 1990 and the 1991 studies were almost equally split between strong agreement and strong disagreement. This split pattern was repeated for the associated items referring to the effectiveness and safety of insecticide use. Visitors in the 1990 study tended to more strongly oppose the use of insecticides.

There was much greater consensus regarding ***restoration*** options. Generally, there was strong agreement across studies and respondent groups that some active rehabilitation effort should be undertaken in areas of severe beetle damage, and the *cut, remove and burn* alternative was consistently preferred over other options. As with insecticide use, the application of herbicides met with responses that were approximately equally split between strong agreement and strong disagreement; the majority of the 1991 respondents were divided equally between strong agreement and strong disagreement with a complete ban on the use of herbicides.

The observed relationships between the observed patterns of support and non-support for alternative forest management policies and the perceptual preferences expressed by the same groups of respondents reveals a potential dilemma. The forest conditions most preferred in the perceptual assessment--where possible, retain green forests dominated by mature spruce, or where damage has already occurred, re-establish green spruce as quickly as possible--are most readily achieved by management policies that were the least acceptable, or that resulted in strongly split opinion, such as the application of insecticides or herbicides. Thus, the future forest conditions most consistently preferred perceptually may be in conflict with the management options most consistently preferred for achieving those conditions. The next section directly addresses the relationships between individual respondent's preferred perceptual *ends*, and their support for the implied management *means*.

PREFERRED ENDS VS ACCEPTABLE MEANS

The conflict between preferred future forest conditions and acceptable management strategies noted above is based on comparisons among average responses over all respondents. Even with this overall pattern of conflict it is possible that individual respondents could hold consistent perceptual and policy preferences; those who strongly prefer green forest conditions might be more tolerant of management practices required to achieve and maintain those conditions, and *vice versa*.

To further investigate this important relationship, and to further articulate the patterns of agreement and disagreement with the management policies assessed in the 1991 study, a **factor analysis** was conducted.[6] This analysis allows the discovery of consistent patterns of responses across the different

policy questions, and provides a better basis for determining the relationships between individual perceptual and policy preferences.

Policy Factors

The analysis revealed several important "factors," defined by consistent patterns in respondents' support (or non-support) for specific sets of management policies. By far the strongest factor (accounting for 37% of the variation in respondents' reactions to the policies offered) was defined by the degree of support (or non-support) for the use of insecticides and herbicides. Respondents scoring high on this ***chemical treatment*** factor tended to support the use of insecticides and herbicides, while those scoring low on the factor tended to be opposed to such treatments. The high end of this factor was associated with strong disagreement (and the low end by strong agreement) with the policies of:

...leaving the (damaged) forest undisturbed; and
...allow most of the spruce trees in your area to be killed by bark beetles (rather) than have the forest treated by cutting and spraying insecticides.

At the same time, the ***chemical treatment*** factor was characterized by stronger agreement (disagreement) with policy statements relating to the use of insecticides for protecting threatened forest areas:

Spraying insecticides is the best way to protect large trees near homes...;
Trees that are sprayed with approved insecticides are essentially 100% safe from bark beetle attack;
Environmentally approved insecticides are perfectly safe...; and
I would be willing to use environmentally approved insecticides...;

while disagreeing (agreeing) with statements that

Insecticides should <u>not</u> be used ... because other insects and animals might be harmed; and
... approved insecticides should not be used because they are potentially dangerous to humans.

With regard to rehabilitation of forest areas already damaged, this factor was defined by stronger agreement (disagreement) with

cutting and removing the dead trees and applying environmentally approved herbicides,

and disagreement (agreement) with

Herbicides should not be used under any circumstances because of possible contamination of the environment.

Following the ***chemical treatment*** factor were four much weaker factors, which achieved minimal statistical criteria for consideration. The second factor (explaining 14% of variance) also involved the degree of support for chemical treatment options, but was primarily defined by the degree to which the continuing bark beetle outbreak was perceived as a ***threat***. Respondents contributing high scores on this factor tended to support chemical treatments, but judged that there was little threat that the bark beetle outbreak would actually continue to spread. The high end of the ***threat*** factor was associated with stronger agreement that:

There is very little chance that the bark beetle outbreak will spread to the area where you

live; and
... if the outbreak does spread to your area, you would not expect more than half of the spruce trees to be lost .

In addition, the ***threat*** factor included agreement with statements indicating that insecticide spraying is *100 % effective* for protecting threatened trees, and *removing trees* (e.g., thinning) is not effective. For rehabilitation *cutting and removing dead trees and applying herbicides* is preferred, while burning is judged to have *as bad an effect on the environment as herbicides*, and burning *should not be allowed because of the danger of starting wildfires*.

The third factor (explaining 13% of variance) was complex, defined by agreement (disagreement) that the outbreak was *certain to spread* coupled with disagreement with "allowing nature to take its course" (except when damage was *less severe* and *far away* from developments). This factor was also associated with preferences for rehabilitating damaged areas by *cut, remove and scrape* treatments and by opposition to burning because of the *danger of starting wildfires*.

The fourth and fifth factors were very weak (explaining 9% and 7% of variance, respectively), but do suggest other patterns of response to the policy options assessed. Factor four was characterized by agreement that the outbreak was *certain to spread*, coupled with support for protecting threatened forest areas by *clear cutting small patches* and for cutting trees on public lands *even if selling the trees will only pay for part of the costs*.

The final factor, which had minimal statistical power, was defined by acceptance that the outbreak will spread to the respondent's area and will do substantial damage (indicated by disagreement with *little chance that the bark beetle outbreak will spread*, and with *not expect more than half of the spruce trees to be lost*), but a willingness to let nature take it's course *near to homes and recreation areas, even when the damage to the forest is more severe*. For areas already severely damaged, the rehabilitation option associated with this factor was *cutting and removing the dead trees and then burning the site with a moderately hot fire*.

Relationships with Perceptual Preferences

To be consistent, respondents whose expressed perceptual preferences indicated a desire to keep threatened spruce forests green, or to have beetle impacted forests restored quickly, should have also supported forest management actions that can effectively achieve those ends (e.g., preventative cutting, insecticide spraying and herbicide use). Alternatively, individuals who disagreed with these forest management approaches should have been more accepting of the visual impacts of bark beetle infestations in forest scenes. To investigate these relationships individual respondent's scores on the management policy factors described above were related to their perceptual preferences as expressed in the four-scene forced choice section of the assessment.

An aggregate measure of perceptual preferences was computed for each respondent as the percentage of choices in which the ***treatment*** scene-set was selected over the ***no-treatment*** set. This measure of preference for treatment-produced forest conditions was related in a multiple linear regression analysis to the five management policy factors described in the preceding section.

Factor Loadings by Policy Item*

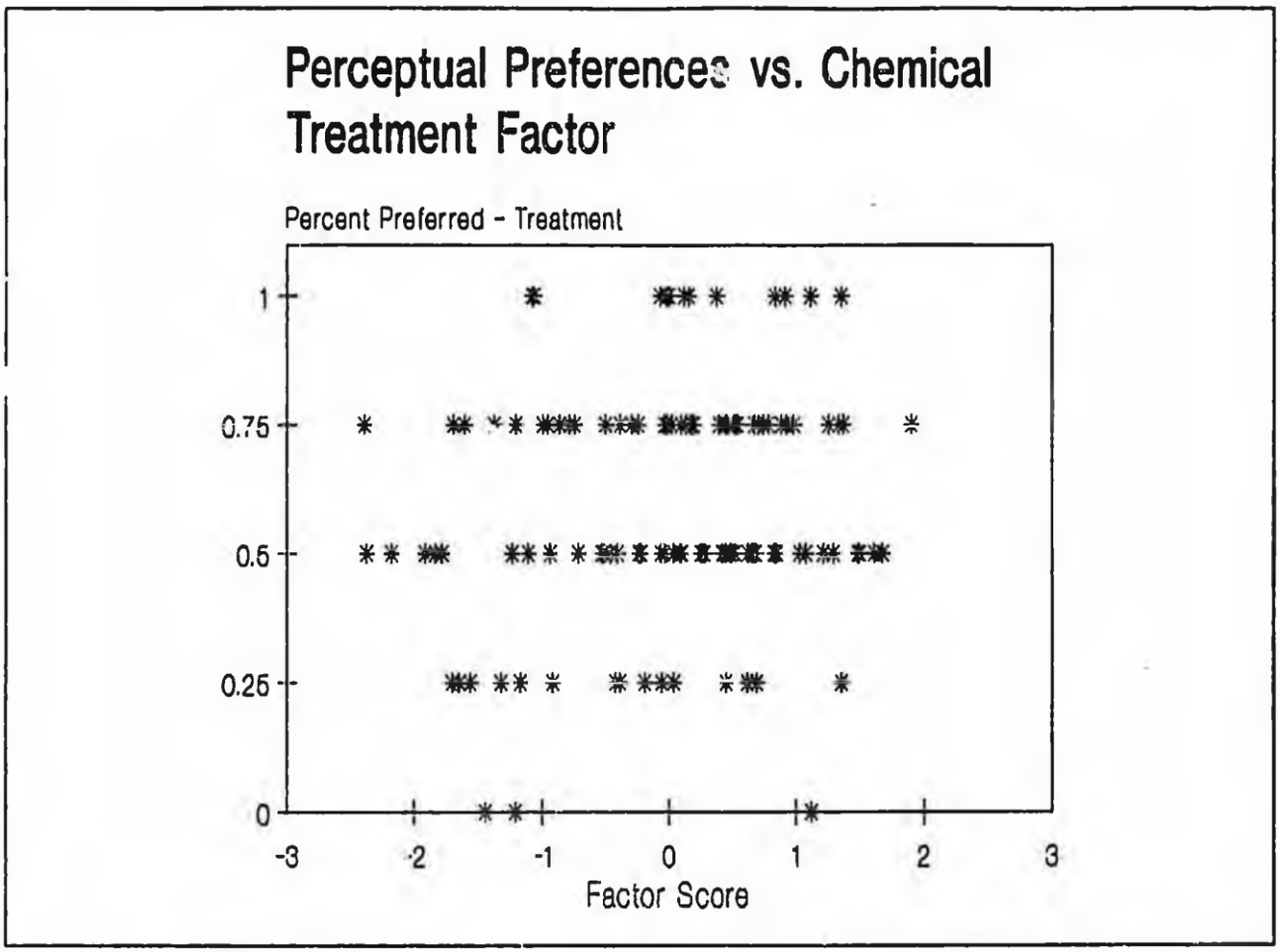
Item #	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4	FACTOR 5
1	.001	-.042	.045	.171	-.166
2	-.134	.024	**-.433**	.252	.070
3	-.142	-.028	**-.403**	.805	.216
4	-.157	.176	**-.452**	.149	**.506**
5	.145	-.098	.331	.279	.023
6	.012	**.402**	-.069	.063	-.104
7	.210	.190	.258	**.386**	-.205
8	-.061	.208	.263	-.069	.293
9	.259	.177	.126	.194	-.086
10	.291	-.178	.084	**.430**	-.037
11	.054	.203	.109	.187	.148
12	**.761**	.135	-.094	-.189	-.071
13	**.558**	**.453**	-.055	.033	.117
14	**.698**	.249	-.183	.090	.058
15	**-.639**	.149	.235	.245	-.039
16	**.794**	.097	-.063	.053	-.026
17	-.259	.051	.114	.044	.128
18	**-.767**	.117	.106	.145	-.075
19	**.418**	.062	.126	.112	.211
20	.336	-.058	.128	.296	**.383**
21	-.036	.244	**.415**	-.078	.053
22	**.604**	**.401**	.085	-.034	.187
23	**-.606**	.174	-.268	.070	.040
24	**-.724**	.015	.198	.074	.221
25	-.395	**.487**	.229	-.262	.125
26	-.285	**.484**	**.396**	-.063	.018
27	.241	-.277	**.434**	**.398**	-.043
28	-.023	**.581**	-.200	.114	-.284
29	-.058	.398	-.246	.213	**-.361**
30	**-.628**	.097	-.228	.227	-.054

* Complete text for Items in attatched Appendix.

The analysis revealed no statistically significant relationships between individual's perceptual preferences and their support (or non-support) for any of the management policy factors, individually or in combination. That is, preferences for the perceptual *ends* were independent of the acceptance of the management *means* most likely to achieve those ends. Further analysis also revealed no consistent differences among the respondent groups sampled (the various Kenai Peninsula resident groups participating in the study) in either perceptual preferences, support for the policy factors or in the relationships between perceptual preferences and patterns of policy support.

Summary

Factor analysis of the agreement and disagreement with the various forest management policies assessed revealed several coherent patterns. The strongest pattern was represented by the ***chemical treatment*** factor. The high end of this factor was defined by higher levels of support for active forest treatments, particularly for the use of insecticides and herbicides, which were accepted as safe and effective methods for prevention, protection, and restoration of the forest. The ***chemical treatment*** factor provided the strongest divisions among the Kenai Peninsula and Anchorage residents who



participated in the 1991 study, but each community represented in the study had effectively equal numbers of individuals at each end of this scale.

The other policy support patterns discovered in the analysis were considerably weaker. A *threat* factor was primarily characterized at the high end by the judgement that the bark beetle outbreak would not spread and would not have very serious consequences if it did. Respondents who scored high on the third factor tended to accept the bark beetle outbreak as a continuing threat, but restricted their support of forest rehabilitation actions to mechanical scarification because of a fear that burning would start wildfires.

The final two factors were both defined by acceptance of the bark beetle as a continuing threat, but those scoring high on the first of these factors tended to support logging as a management approach (including clear cutting and selling trees at a loss), while the weaker of these last two factors was associated with the willingness to accept the consequences of the outbreak and to allow nature to take its course. As for the first factor, there were no consistent patterns of differences among the communities sampled in their scores on these factors.

CONCLUSIONS

The spruce beetle outbreak on the Kenai Peninsula was almost universally recognized as a serious problem by residents of the area. *Increased fire danger* and *loss of scenic beauty* were identified as the most important effects of the bark beetle infestation. Most respondents believed that the outbreak will continue to spread and that their own properties will be significantly affected.

For tourists and visitors to the affected areas sight-seeing was by far the most frequent activity, and the quality of natural scenery was consistently reported as the most important factor affecting their enjoyment of their trip. Clearly, the visual impacts of the bark beetle outbreak are of great concern to both residents and visitors to the Kenai Peninsula, and should be a key consideration in any forest management decisions for the area.

Perceptual Preferences

The assessment of the perceived effects of the beetle outbreak on forest scenery, based primarily on computer video simulations, revealed several consistent patterns. First, whether presented as color slides, color prints or as video images, the greater the proportion of beetle killed trees in a forest scene the lower the rated scenic beauty. This pattern obtained for residents and visitors alike. Second, a hypothetical preventative thinning treatment was consistently preferred to a (retrospective) no treatment infestation scenario which allowed virtually all of the spruce to die. Finally, for forest areas where bark beetle impacts were already severe, respondent's preferred the visual conditions produced by rehabilitation strategies that resulted in more rapid regeneration of forest cover.

The consistency of responses from different respondent groups (residents, visitors and two college student samples), and between the different presentation media employed, strongly supports the conclusion that the results of the perceptual assessments provide a valid basis for predicting the perceptions of residents and visitors who view similar forest scenes directly. The visual impacts of the spruce bark beetle outbreak do significantly affect the quality of resident and visitor experience.

Support for Management Alternatives

The acceptability of alternative forest management responses to the bark beetle outbreak were assessed separately by a series of verbal statements. In areas likely to be seen or visited by people, areas near homes and developed recreation areas, the majority of residents in both the 1990 and the 1991 studies preferred some form of treatment over "allowing nature to take its course." The particular treatment options preferred depended upon the stage of the outbreak.

Prevention in threatened areas: The preferred treatment was to thin threatened spruce stands (by approximately 50%). This preference obtained even though respondents understood that large trees should be taken first and that the costs of treatment (which should include replanting trees) might exceed the revenues likely to result from selling the cut trees.

Protection during an outbreak: Opinion was

most divided here, especially with regard to the possible roles of insecticide spraying. At one extreme were individuals who viewed sprays as less than 100% effective, potentially harmful to animals and dangerous to people. Based on these views, they disagreed with use of "environmentally approved insecticides." None-the-less, many of these same respondents indicated that they would use insecticides to protect high valued trees on their own property. At the other extreme was a group of respondents who agreed that sprays are "the best method" for protection. However, many of these respondents did not believe sprays to be "100% effective," and they tended to be divided on whether spraying was "too expensive for most private property owners."

Restoration after an outbreak: The clear message here was **Do Something!** Preferred actions included cut and remove dead trees (even if selling them will recover only part of the costs), then burn the site to aid in the re-establishment of a spruce forest. Danger of wildfire caused by site preparation burning was generally not viewed as a sufficient concern to preclude fire as a treatment option. Scraping the ground was not widely accepted as a regeneration method, though it did appeal to a minority who were concerned that burning treatments might cause wildfires. The use of herbicides, paralleling the results for insecticide spraying, produced wide splits in opinion, and herbicides were generally less preferred than burning.

Ends vs Means

The analysis of individual respondent's perceptual preferences and the management policies they supported revealed no significant relationships. Perceptual preferences and support for management policy options were assessed separately, so the visually presented *ends* were never directly associated or paired with the management *means* which they most likely implied. This opportunity to "have your cake and eat it too" is not unlike the situation created by most of the public participation activities typically associated with forest management planning.

In the "real world," of course, any given set of forest conditions is necessarily associated with a particular, limited set of management options--forest condition ends are generally not separable from their forest management means. In the context of the spruce bark beetle outbreak on the Kenai Peninsula, for example, the combination of maintaining a dense mature spruce forest and adopting a policy of "allowing nature to take its course" is not a realistic option.

In bark beetle threatened areas, cutting some of the spruce trees now (thinning or patch cutting) may be the only cost-effective way to prevent all the trees from being lost later. The use of insecticides and herbicides is clearly controversial and can be relatively expensive. However, chemical treatments are often the only viable means of protecting threatened high-value trees in campgrounds and near residences, or of insuring regeneration of spruce on important sites where forests have been destroyed by bark beetle infestation.

Implications for Management

The assessment studies reported here, along with the results of the Alaska State telephone survey, provide important insights into public perceptions and values regarding Kenai Peninsula forests and forest management policies. Residents are acutely aware of the bark beetle outbreak, and they expect it to

continue to spread. Residents and visitors alike are perceptually sensitive to the visual impacts of the bark beetle outbreak, and they are concerned with an array of scenically-based forest values that may be adversely affected.

The highest level of concern is for severely affected forests near residential and recreation developments. Any forest management strategy that is responsive to public values and concerns must address visual impacts of the spruce bark beetle outbreak. At the same time, many forest management actions themselves have visual impacts (especially vegetation management alternatives) which must be taken into account; it is important that the management "cure" not produce visual effects that are worse than the bark beetle "disease."

There is a general consensus that some active forest management response is needed and desired. However, there is considerably less consensus regarding what that response should be. Respondents were particularly divided on the acceptability of using insecticides to protect threatened forest strands or of using herbicides to help regenerate spruce on stands already heavily damaged.

There was inconsistency between the perceptually preferred future forest conditions and the acceptability of forest management practices most likely required to achieve those conditions. This inconsistency derives in part from the fact that perceptual and management policy preferences were assessed separately. There was also an indication, however, that respondent's knowledge and/or beliefs about the various management options may not be sufficient for them to make meaningful means-ends trade offs. For example, a significant number of respondents did not believe that insecticides can provide complete protection (for a three year period) against bark beetle attach. Also, even though both were described as "environmentally approved," significant numbers of respondents apparently were not convinced that insecticides or herbicides are safe. If chemical treatments are thought to be less effective and less safe than they actually are, it is unlikely that the public could properly assess their relative costs and benefits as responses to the bark beetle outbreak.

Overcoming the means-ends dilemma will require attacks on several fronts. First, a concerted "environmental education" effort directed at the concerned publics would seem to be indicated. This would require that the scientific community, in and outside the Forest Service and forestry professions, reach a consensus on the effectiveness and safety of chemical treatment options for protecting beetle-threatened forest stands and for regenerating stands already impacted. Then, this consensus must be effectively communicated to the public. Second, the public should be presented with meaningful forest condition-management policy options; in effect they must be allowed to choose among future forest conditions packaged together with the management policies required to achieve those conditions.

Future Research Directions

Computer visual simulation technology was demonstrated to be very effective in communicating the important visual impacts of the spruce bark beetle outbreak. Visualizations also provided concrete comparisons with the visual effects of alternative management actions that might be required to protect or rehabilitate affected forest stands. Respondents were willing and,

apparently quite able, to make consistent choices among alternative future forest conditions that involved changes over as much as a 50-year time period.

Responses to the verbally presented management alternatives produced consistent and coherent patterns of response; the ***chemical treatment*** factor provided the strongest basis for distinguishing among respondent's policy choices. However, there were no consistent relationships between the perceptual *ends* that were preferred and support for the management *means* most likely required to achieve the desired forest conditions.

Based on the outcomes of the two studies reported here, additional efforts are indicated in two important areas. First, visual simulations of alternative future forest conditions should be improved by strengthening the links between forest data, both from inventories and as projected by biological models, and the detailed features of the digital video image representations of those data. Data visualization technology is improving very rapidly, and more refined and consistent algorithms for translating quantitative data into concrete visual representations are being developed. Of equal importance to valid visual simulations are efforts to improve the biological bases for more precisely predicting future forest conditions, including details of the spatial and temporal distributions of projected forest changes.

Second, better formats should be developed for presenting visual simulations together with descriptions and other information about the forest management activities that the achievement and maintenance of those conditions imply. The metric conjoint analysis paradigm[7] and mathematical modeling techniques developed within the marketing research and consumer decision analysis fields offer promising approaches in this regard.

FOOTNOTES

[1] State of Alaska, Department of Natural Resources, Division of Forestry (1992) *Forest health management plan for the western Kenai Peninsula and Kalgin Island*. 40 p.

[2] Daniel, T.C., B. Orland, A. Lynch, J. Hetherington and J. La Fontaine (1990) Integration of GIS and video imaging technology for data-driven visual simulations. In J. Greer (Ed.) *Protecting natural resources with remote sensing*. American Society for Photogrammetry and Remote Sensing, Bethesda, MD, 1990.

[3] Kruse, J. and R. Pelz (1991) *Developing a public consensus on the management of spruce bark beetle on the Kenai Peninsula*. Institute of Social and Economic Research, University of Alaska, Anchorage, AK, 36 p.

[4] Orland, B. (1988) Video imaging: a powerful tool for visualization and analysis. *Landscape Architecture*, 78(4), 78-88.

Orland, B. (1991) Digital image processing aids for visual simulation of forest management practices. In T. Daniel and I. Ferguson (Eds.) *Integrating research on hazards in fire-prone forest environments*, US Man and the Biosphere Program, US Department of State, Washington, DC. 73-83.

[5] Daniel, T.C. and R.S. Boster (1976) *Measuring landscape aesthetics: the Scenic Beauty Estimation Method*. USDA Forest Service Research Paper RM 167, Rocky Mountain Forest and Range Experiment Station, Fort Collins, CO. 66 p.

[6] Gorsuch, R.L. (1983) *Factor analysis*, 2nd Edition, Hillsdale, NJ: Lawrence Earlbaum Associates.

[7] Louviere, J.J. (1988) *Analyzing decision making: metric conjoint analysis*. Sage University Paper series on Quantitative Applications in the Social Sciences, Beverly Hills, CA: Sage Publications. 95 p.

Appendix

Copy of 1991 Assessment Instrument

Environment Perception Assessment

Alaska

ENVIRONMENT PERCEPTION LABORATORY
UNIVERSITY OF ARIZONA

IMAGING SYSTEMS LABORATORY
UNIVERSITY OF ILLINOIS

FOREST RECOVERY AFTER BEETLE ATTACK

The following sets of pictures show how bark beetle-attacked areas in Kenai Peninsula forests could look in the future. The areas shown have all been affected by the spruce bark beetle outbreak, and now over 90% of the spruce trees are dead.

Pictures are arranged four to a page in this pattern:

5 YR	10 YR
20 YR	50 YR

Each page shows how the scene would be expected to look **five, ten, twenty** and **fifty years** in the future if certain forest management actions were taken. Each forest area is represented by two pages of scenes, each depicting the expected results of a different forest management approach. Actions might range from simply allowing nature to take its course (no action) to cutting and removing all of the dead trees and planting a new forest. Several of the pages show the effects of fire, either "prescribed" fire used as a management tool, or wildfire.

Some actions result in poorer results in the short term, but better results in the longer term. Other management options may do better in the short term, but not so well in the longer term.

There are fourteen pairs of scene pages. Each pair shows the expected results of two different management actions for the same forest area. We are interested in your judgement of which page of scenes in each pair represents the **best overall scenic quality.**

Please quickly look through all of the pages of scenes, then evaluate each pair of pages one at a time. For each pair, select which page (**A** or **B**) represents the best overall results for the forest area shown.

Record your choice for each pair by circling the appropriate letter (**A** or **B**) on the answer sheet provided.

CORRECTION

THIS DOCUMENT
HAS BEEN REPHOTOGRAPHED
TO ASSURE LEGIBILITY

Environment Perception Assessment

Alaska

ENVIRONMENT PERCEPTION LABORATORY
UNIVERSITY OF ARIZONA

IMAGING SYSTEMS LABORATORY
UNIVERSITY OF ILLINOIS

ENVIRONMENT PERCEPTION ASSESSMENT

The purpose of this study is to investigate public perceptions of the effects of the spruce bark beetle outbreak on the Kenai Peninsula, and to determine what forest management actions are most acceptable to residents of beetle-affected or beetle-threatened areas.

Forests in Alaska are important for many reasons--wildlife, timber, oil and minerals, wilderness and outdoor recreation, and natural scenic beauty to name only a few.

In this study we are interested in the publics' perceptions of the spruce bark beetle outbreak on the Kenai Peninsula. In some places the beetles have already killed most of the trees, and the question is how the affected forests will recover. In areas where the beetle outbreak is now threatening to spread, the question is whether we should attempt to protect the forest and, if so, how.

Responding to the bark beetle outbreak requires the cooperation of a number of federal, state and local government agencies as well as many private land owners. The beetles do not recognize jurisdictions or property boundaries.

It is very important, therefor, that the perceptions and concerns of people who live, work and recreate in the affected areas be considered in decisions about how to respond to the beetle outbreak.

This booklet presents sets of pictures showing how several forest areas could look in the future. The pictures were created with the help of a computer. The conditions shown are based on information about forest conditions and growth patterns, including the effects of bark beetles and forest management actions. You will be asked to judge which of the forest conditions shown you would most prefer. There will also be some questions about the effects of the bark beetle outbreak and about some of the possible ways of dealing with it.

Thank you very much for your help.

FOREST RECOVERY AFTER BEETLE ATTACK

The following sets of pictures show how bark beetle-attacked areas in Kenai Peninsula forests could look in the future. The areas shown have all been affected by the spruce bark beetle outbreak, and now over 90% of the spruce trees are dead.

Pictures are arranged four to a page in this pattern:

5 YR	10 YR
20 YR	50 YR

Each page shows how the scene would be expected to look **five**, **ten**, **twenty** and **fifty years** in the future if certain forest management actions were taken. Each forest area is represented by two pages of scenes, each depicting the expected results of a different forest management approach. Actions might range from simply allowing nature to take its course (no action) to cutting and removing all of the dead trees and planting a new forest. Several of the pages show the effects of fire, either "prescribed" fire used as a management tool, or wildfire.

Some actions result in poorer results in the short term, but better results in the longer term. Other management options may do better in the short term, but not so well in the longer term.

There are fourteen pairs of scene pages. Each pair shows the expected results of two different management actions for the same forest area. We are interested in your judgement of which page of scenes in each pair represents the **best overall scenic quality.**

Please quickly look through all of the pages of scenes, then evaluate each pair of pages one at a time. For each pair, select which page (A or B) represents the best overall results for the forest area shown.

Record your choice for each pair by circling the appropriate letter (A or B) on the answer sheet provided.

PROTECTING THREATENED FOREST AREAS

All of the sets of scenes in the previous pages showed views of forest areas that have already been severely affected by spruce bark beetles. The following two pairs of scene sets show possible future conditions for two forest areas that are just beginning to be attacked by beetles.

As in the previous pages, the scenes represent conditions **3, 6, 9** and **12 years** in the future. In the two forest areas shown, most of the spruce trees are currently alive and uninfested by bark beetles. However, both areas are in the path of a spreading beetle outbreak.

Pictures are arranged four to a page in this pattern:

3 YR	6 YR
9 YR	12 YR

The set of four scenes on each page shows how one forest area is expected to look in the future as a result of taking particular management actions now. Possible actions range from allowing the beetle outbreak to take its own course, perhaps only cleaning up dead and fallen trees later, to thinning out some of the threatened trees and spraying some with environmentally approved insecticides.

Please look at the scenes and then select the page in each pair which represents the **best overall visual quality.** As for the previous sets, mark your choices on the answer sheet by circling the letter (**A** or **B**) to indicate which page in each pair provides the best overall visual results.

FOREST MANAGEMENT APPROACHES

On the following pages are 30 statements regarding different aspects of the spruce bark beetle outbreak on the Kenai Peninsula and possible forest management responses. Please read each statement and determine how much you would agree or disagree with it.

Record your answers on the answer sheet provided, by marking the appropriate box from

Strongly Agree to **Strongly Disagree**

The statements are divided into five sets. Each set of statements is preceded by a short introduction.

One response to the spruce bark beetle outbreak is to accept it as a natural process and to just "let nature take its course." In remote areas this may be the only possible response. In some Parks and Wilderness Areas it may be the only alternative allowed by law. Where managers have a choice, the best policy is to let nature take its course, so long as the area is:

1. far away from homes and recreation areas, but only when the damage to the forest is less severe, and new trees are expected to eventually grow back in the area.

2. far away from homes and recreation areas, even when the damage to the forest is more severe, and only grass and brush is expected to grow back in the area.

3. near to homes and recreation areas, but only when the damage to the forest is less severe, and new trees are expected to eventually grow back in the area.

4. near to homes and recreation areas, even when the damage to the forest is more severe, and only grass and brush is expected to grow back in the area.

One method for protecting forest areas that are threatened by the bark beetle outbreak is to remove about half of the trees. This is intended to reduce the number of places for the beetles to breed and to help the remaining trees grow more vigorously so that they are better able to resist beetle attacks.

5. Bark beetles prefer to attack larger more mature spruce trees, so it is best to remove the larger trees first.

6. Removing trees from beetle-threatened areas is generally not effective in protecting the remaining trees.

7. Clear cutting small patches is the best way to remove trees and protect spruce forests.

8. Thinning, by removing a few trees here and there, is the best way to remove trees and protect spruce forests.

9. When trees are removed to protect public forests from beetles, the cut trees should be sold to private companies.

10. Managers should cut trees on public lands to help protect beetle-threatened forests, even if selling the trees will only pay for part of the costs.

11. If trees are to be cut on public lands, all logging roads should be closed and disturbed areas should be replanted.

During a bark beetle outbreak it is possible to protect selected trees by spraying environmentally approved insecticides directly on the bark. Spraying costs about 5 to 10 dollars per tree and lasts for up to three years.

12. Spraying insecticides is the best way to protect large trees near homes and important recreation areas.

13. Trees that are sprayed with approved insecticides are essentially 100% safe from bark beetle attack.

14. Environmentally approved insecticides are perfectly safe for use around homes and recreation areas.

15. Insecticides should <u>not</u> be used to protect trees from bark beetles because other insects and animals may be harmed.

16. I would be willing to use environmentally approved insecticides to protect important trees near my home.

17. Spraying approved insecticides to protect trees from beetles is too expensive for most private property owners.

18. Approved insecticides should not be used because they are potentially dangerous to humans.

After a major beetle outbreak, a primary concern for forest areas that are frequently visited or seen by people is with how to treat the large areas of dead trees. Often more than 90% of the spruce trees are dead. New spruce trees need bare soil and sunlight to get started, and they need protection against competing grasses and brush for the first few years. The best treatment for beetle-affected forest areas is:

19. cutting down the dead trees and then burning the site with a very hot fire to clear the ground and kill competing grass and brush.

20. cutting and removing the dead trees and then burning the site with a moderately hot fire to partially clear the ground and temporarily reduce competing grass and brush.

21. cutting and removing the dead trees and mechanically scraping the ground bare in some areas to temporarily reduce competing grass and brush.

22. cutting and removing the dead trees and applying environmentally approved herbicides to temporarily reduce competing grass and brush.

23. leaving the forest undisturbed, and allowing it to recover as best it can.

24. Herbicides should not be used under any circumstances because of possible contamination of the environment.

25. Burning produces smoke and other by-products that could have as bad an effect on the environment as herbicides.

26. Burning forest sites should not be allowed because of the danger of starting wildfires.

The spruce bark beetle outbreak has now affected over 200,000 acres on the Kenai Peninsula. Biological surveys indicate that the outbreak may be continuing to spread.

27. It is almost certain that the outbreak will spread to other areas on the Kenai Peninsula.

28. There is very little chance that the bark beetle outbreak will spread to the area where you live.

29. Even if the outbreak does spread to your area, you would not expect more than half of the spruce trees to be lost.

30. All things considered, you would rather allow most of the spruce trees in your area to be killed by bark beetles than to have the forest treated by cutting and spraying insecticides.

COMMERCIAL TIMBER RESOURCES OF THE KENAI PENINSULA BOROUGH

General Information

Directory of Timber Owners

Attachments

110 S. Willow St., Suite 106 • Kenai, Alaska 99611 • (907) 283-3335 FAX (907) 283-3913

KENAI PENINSULA BOROUGH
ECONOMIC
DEVELOPMENT
DISTRICT, INC.

October, 1992

Dear Timber/Wood Products Colleague:

There are exciting opportunities within Alaska's Kenai Peninsula Borough!

Motivated by the growing world-wide shortage of timber and the increasing prevalence of spruce bark beetles within their vast spruce forests, the Borough, with the unprecedented cooperation of state and federal governments and private timber owners, has created the enclosed catalogue, Commercial Timber Resources Of The Kenai Peninsula Borough.

As an important participant in the timber/wood products industry, you will find the catalogue to be a valuable source of information on most everything you need to know to take advantage of the substantial timber opportunities throughout the Kenai Peninsula Borough.

The catalogue contains summary data on existing and planned infrastructure, socio-economic-cultural conditions in the Borough, regulations, names and addresses of all involved agencies and, most important, a comprehensive directory of available timber resources that have been offered by their respective owners.

The directory is divided in two sections: Public Owners and Private Owners. Each listing details total acreage offered, special harvesting conditions (if any) and the name, address and phone number of the individual to contact for further action.

Please let me know if I can help in any way. We're looking forward to working with you.

Sincerely,

Mike Sims
Director of Business Development

MS/rjp

Additions to: COMMERCIAL TIMBER RESOURCES OF THE KENAI PENINSULA BOROUGH, Part 2, Directory of Timber Owners

Name and Contact Address	Description
Del Alsop PO Box 2317 Sequim WA 98382 (206) 683-1941 work (206) 681-2548 home	526 acres large timber, 90% spruce, some birch; unimpacted by spruce bark beetle to owners knowledge. located above Anchor Pt.
Genese A. Craddock (Izuno) 2270 35th Avenue San Francisco CA 94116 and Frederick J. Bailey PO Box 4335 Sante Fe NM 87502 (505) 983-9714	40 acres, 80% spruce, 15% birch, 5% aspen/cottonwood; unimpacted by spruce bark beetle to owners knowledge; location: T05SR14WS20, SW1/4 NE 1/4 , CNTG 40.00 acres
Frederick J. Bailey PO Box 4335 Santa Fe NM 87502 (505) 983-9714	40 acres, 80% spruce, 15% birch, 5% aspen/cottonwood unimpacted by spruce bark beetle to owners knowledge; location: SES20, T5S,R14W, S.M. NE1/4 NW1/4, CNT6, 40.00 ac M/L
Robert K. Craddock, Jr. Greenbriar Way Fair Oaks CA 95628 (916) 965-3910 and Frederick J. Bailey PO Box 4335 Santa Fe NM 57502 (505) 983-9714	40 acres, 80% spruce, 15% 5449 birch, 5% aspen/cottonwood, unimpacted by spruce bark beetle to owners knowledge; location: TO5SR 14W S20 NW1/4 CNTG 40.00 ac M
Tammy L. Westover PO Box 84 Kasilof AK 99610-0084 (907) 283-4089	4 acres, 90% spruce, 5% birch, 5% aspen/cottonwood impacted by spruce bark beetle; location: Lot 13 Old Kasilof Subdivision

Gary E. Shaw 8341 Sue Street Anchorage AK 99502-4280 (907) 248-0404 work (907) 243-2926 home	30 acres, type of timber not specified, unknown if impacted by spruce bark beetle; location: Lot 367 Gray Cliff Sub., plat 82-80
Roger Hansen Box 744 Sterling AK 99672 (907) 262-5816	10 acres, 50% spruce, 50% aspen/cottonwood, unimpacted by spruce bark beetle; location: Mile 1, Feudin Lane, Sterling
James R. Van Oss 48750 East End Road Homer AK 99603 (907) 2355-7591	80 acres, 100% spruce, unimpacted by spruce bark beetle; location: S NW 1/4 Sec. 27 T4S R11W, SM
Mary Burt 118 Townsend Drive Florence MS 39073 (601) 845-7280	30.96 acres, type of timber not specified, unimpacted by spruce bark beetle; location: T07N R11 WS 26 KN860203 Kanovolof Lake Subdivision, Amended, TR 50 CNTG 3355.96 AC M/L
Yule F. Kilcher Box 353 Homer AK 99603 (907) 235-8713	400 acres. 99% spruce, 1% birch, property 600 acres west of McNeil Canyon, 1 mile of coast
James Rainwater 47010 Kunz Drive Homer AK 99603 (907) 235-6616	100 acres, 100% spruce, ASLS 77-68 , 22 miles E. Road

COMMERCIAL TIMBER RESOURCES OF THE KENAI PENINSULA BOROUGH

KENAI PENINSULA BOROUGH
ECONOMIC DEVELOPMENT DISTRICT
110 S. WILLOW ST., SUITE 106
KENAI, AK 99611
(907) 283-3335
FAX (907) 283-3913

Funding for this document has been provided by: the U.S. Department of Agriculture, USFS; the State of Alaska Department of Commerce and Economic Development; Division of Economic Development; and, the Kenai Peninsula Borough Economic Development District, Inc.

10/92

TABLE OF CONTENTS

PART ONE - GENERAL INFORMATION

PART TWO - DIRECTORY OF TIMBER OWNERS

PUBLIC TIMBER OWNERS

PRIVATE TIMBER OWNERS

ATTACHMENTS

Alaska Forest Resources and Practices Act - 1990 booklet is attached under separate cover.

Vegetation and land ownership maps are available by request from the Kenai Peninsula Economic Development District, Inc.

PART ONE

GENERAL INFORMATION

INTRODUCTION

The Kenai Peninsula Borough Economic Development District, Inc. (EDD) and the Kenai Peninsula Borough Timber Resource Utilization Task Force (Task Force) are pleased to present this information about the Borough's timber resources for use by forest products companies interested in establishing an operation in an area with an abundant timber supply, a skilled work force and a favorable social and political climate for new business. This publication has been prepared to provide you with background information that will be useful in assessing the business opportunities within the Borough and in answering questions you may have about its timber, governmental structure, regulations, programs and work force. This publication also includes a listing of owners of public and private timber interested in participating in a timber sale program.

Alaska's political subdivision system is unlike the rest of the United States. The State of Alaska is not divided into counties. Portions of the state are unincorporated and have no political subdivision lower than the State level. Areas with two or more cities may organize into Boroughs (in some cases, a combination borough-city). These Boroughs are somewhat analogous to counties but are quite often much larger in geographic area. This is the case with the Kenai Peninsula Borough which comprises some 25,600 square miles of total area, including land and water.

We hope this publication is useful in answering your initial questions regarding the feasibility of conducting a forest products related business within the Kenai Peninsula Borough or with its timber resources. The Kenai Peninsula Borough, the EDD and the Task Force, are looking forward to assisting in the development of your timber related project.

PHYSICAL DESCRIPTION OF THE KENAI PENINSULA BOROUGH

Topography

The Kenai Peninsula Borough is located within Alaska's Southcentral Region, an area normally defined as that part of Alaska lying east of the mountains of the Alaska Range, south of the Talkeetna mountains and west of the Wrangell mountains. Southcentral Alaska is a vast area that covers some 53 thousand square miles and includes the Matanuska, Susitna and Copper River Valleys, the Greater Anchorage Area, Prince William Sound, Cook Inlet and the Kenai Peninsula.

The Kenai Peninsula Borough is located south of the Municipality of Anchorage and encompasses a total area of 25,600 square miles and includes the entire Kenai Peninsula and a large area of land on the west side of Cook Inlet. The total land area of the Borough is 15,500 square miles. The Kenai Peninsula has a land area of 8,125 square miles and the Borough lands on the west side of Cook Inlet cover an area of 7,375 square miles. The topography of the Kenai Peninsula Borough is quite varied and in some locations very

dramatic. The east half of the Kenai Peninsula is dominated by the Kenai Mountains. Although not high relative to other mountain ranges in Alaska, the Kenai Mountains are extremely rugged and have great relief. The average elevations range between 3,000 and 5,000 feet with the highest point, an unnamed peak, rising to 6,800 feet. An area of intense active glaciation, the Kenai Mountains include some of the largest ice fields in North America. The mountainous portions of the Kenai Peninsula receive very heavy precipitation during the winter from maritime storm systems which develop in the Gulf of Alaska.

The western portion of the Kenai Peninsula is dominated by a broad lowland plain which is roughly triangular in shape narrowing at the southern tip of the Peninsula. This lowland, actually a piedmont, is covered by glacial deposits and stream and terrace gravels. That portion of the Borough that lies on the west side of Cook Inlet is mostly a lowland very similar in character to the west side of the Kenai Peninsula, but in reverse, bounded by mountains along its western margins. On both sides of Cook Inlet these lowlands are bisected by numerous rivers and dotted with lakes.

Geology

The mountainous portion of the Kenai Peninsula is a geologic extension of the Chugach mountains which lie to the north of the Peninsula and extend in an east-west trending arc for some 300 miles, roughly parallel to the coast of Southcentral Alaska. These mountains are composed predominantly of mesozoic rocks, mostly slates, argillites and graywackes, with minor occurrences of granites and greenstones. They are heavily mineralized. Gold, chromium and copper are the minerals of historic and economic value. The first discovery of gold in Alaska was in 1848 by Russian prospectors at Cooper Creek near the present day community of Cooper Landing.

The basement rocks of the Kenai and the Cook Inlet lowlands are composed of tertiary age sedimentary material. Numerous glaciation episodes have strongly influenced the surficial geology of these lowlands. The existing topography is due to the erosive action of glaciation and to the deposition of numerous moraines, along with more recent deposits of alluvial gravels.

Soils

As is the case in most mountainous areas, soils in the eastern, mountainous portions of the Kenai Peninsula and in the Alaska Range mountains which form the western border of the Borough are thin and not well developed. Tree line is at 1000 to 1500 feet and soils support only simple vegetation communities above tree line, principally grasses, forbs, sedges and brush-form willow and alder.

Soils on the Kenai and Cook Inlet lowlands have been categorized into an association of types that are generally described as loamy with principal components consisting of loess, ash and fine gravels. In areas of good drainage, these soils may be up to 40 inches in depth over a gravelly, glacially originated sub-surface. In areas of poor drainage, fibrous, organically derived soils are present. These soils often consist of laminations of mosses and sedges and tend to retain large amounts of water.

The better drained soils within the region are suitable for cultivation and timber harvesting activities including road construction. it is on these soils that white spruce and birch are the dominant timber types. The high organic content, poorly drained soils may occur in pockets within areas which are otherwise well drained. The occurrence of these wet pockets may limit harvesting activities within certain timber stands. The most practical solution to this problem may be to limit harvesting activities in these areas to winter months when frozen ground will support the weight of equipment.

Climate

The Kenai Peninsula Borough has a maritime climate. In comparison to interior Alaska, and even to those portions of Southcentral Alaska north of Anchorage, summers are cool but winters are warm for the latitude. Annual precipitation ranges between 60 and 200 inches per year. This figure includes rain and water equivalent snow. The high precipitation areas are generally the mountainous regions on the eastern portion of the Peninsula. Average temperatures range from 5 degrees to 65 degrees F. In an average year at the lower elevations where timber harvesting operations would likely occur, freezeup and the first snows occur in middle to late October. Spring breakup normally starts in early to mid-April and lasts four to six weeks.

Timber

Approximately 22% of the total land area of the Kenai Peninsula Borough (9.9 million acres) is forested (2.2 million acres). That portion that is considered to be commercial timberland covers about 645,500 acres. Timberland is usually defined in Alaska as land growing or capable of growing timber at a rate of 20 cubic feet per acre per year. However, 223,000 acres of this commercial timberland is not available for harvest due to its land classification status. These 223,000 acres are located within national parks, wilderness areas or wildlife refuges. In addition to the 645,500 acres above, an additional 45,000 acres (estimated) does not produce 20 cubic feet per acre per year, but has volumes of 800 cubic feet per acre or greater and is operable. Timber on land in this classification is considered to be economically feasible for harvest if it is reasonably accessible. We have termed this land operable/non-commercial in the following forest land area table:

FOREST AND COMMERCIAL TIMBER LAND AREA OF THE KENAI PENINSULA BOROUGH

Location	Area in Acres			
	Total land area	Forest land	Commercial	Operable/ noncomm
Kenai Peninsula	5,200,000	1,900,000	481,700	30,000
W. side Cook Inlet	4,700,000	320,000	163,800	15,000
Total acres	9,900,000	2,220,000	645,500	45,000

Note: This information was derived from several sources. The totals may be off due to rounding. Total land areas were supplied by the Kenai Peninsula Borough Planning Department staff areas of forest land and commercial timberland were taken from timber inventory data by Mr. John Hall, Taiga Resource Consultants, and from the U.S. Forest Service publication, Timberland Resources of the Kenai Peninsula, Alaska, 1987 by van Hees and Larson. Areas of operable/non-commercial timberland are estimates by Mr. Charles Nash, Consulting Forester, derived from aerial photo interpretation and field observation.

Ownership of commercial and operable/non-commercial timberland within the Kenai Peninsula Borough is shown on the following table:

OWNERSHIP OF KENAI PENINSULA BOROUGH COMMERCIAL AND OPERABLE/NON-COMMERCIAL TIMBERLAND

Owner	Acres (estimated)	
	Commercial	Operable/non-commercial
Chugach National Forest	79,000	
National Park Service*	28,000	
Kenai National Wildlife Refuge*	195,000	
State of Alaska	94,000	20,000
Kenai Peninsula Borough	30,000	6,000
University of Alaska	4,500	1,000
Native Corporations	195,000	13,000
Private	20,000	5,000
Total acres	645,500	45,000
Less commercial timberland in Refuge and Park*	223,000	
Potentially available total	422,500	45,000

Note: The above information was taken from several sources, including inventory work performed by Mr. John Hall, Taiga Resource Consultants, the U.S Forest Service publication, Timberland Resources of the Kenai Peninsula, Alaska, 1987 by van Hees and Larson, and from inquiries to individual land owners by Charles Nash, Consulting Forester.

The Borough's most predominant tree species is hybridized white spruce; however, birch is also quite common. On the eastern side of the Kenai Peninsula a white spruce - western hemlock type occurs. This is the northern and westward limit of hemlock in North America. Most of the spruce-hemlock type occurs on lands owned and administered by the U.S. Forest Service and is not available for harvest.

The white spruce on the Kenai Peninsula hybridizes with Sitka spruce and is known as Lutz spruce. This hybrid is very similar to white spruce in its appearance; field identification and species differentiation between white and Lutz spruce is extremely difficult. Discussions of species volumes in most Alaska publications combine the Lutz spruce with white spruce in regions where both species occur and call it all white spruce, as has been done here. However, lumber from Lutz spruce has appearance and physical characteristics that are more like low grade Sitka spruce than white spruce.

The spruce stands in the Kenai Peninsula Borough and other parts of Southcentral Alaska are in the midst of a major Spruce Beetle infestation. Normally found only in white spruce, this beetle infestation has spread throughout the Kenai Peninsula and is now established in Sitka spruce as well as the white spruce. A significant percentage of the commercial and operable/non-commercial timberland on the Kenai Peninsula is now impacted to some degree by the beetle infestation. Beetle damage has also been observed within the Kenai Borough on the west side of Cook Inlet.

Wildlife

The Kenai Peninsula Borough provides habitat for a variety of large and small mammals and birds. The Kenai National Wildlife Refuge encompasses some 1.2 million acres and provides habitat for the highest concentrations of moose in Alaska.

Moose range throughout the Kenai Peninsula Borough except in the extremely mountainous areas. The Kenai Peninsula has a small resident herd of caribou and the mountainous regions of the Peninsula provide habitat for mountain goats and Dall sheep. Both black bear and brown/grizzly bear are found throughout the Borough in the more remote areas.

Fish and marine life

The Kenai Peninsula Borough is an area rich in fish and marine life. The rivers of the region produce and support large populations of salmon. Commercial fishing, fish processing and in recent years, fishing related tourism are the basis for much of the Borough's economy.

In addition to fish harvesting, the marine and coastal areas of the Borough support a diverse mix of marine mammals, sea and shore birds, and other marine life.

SOCIO - POLITICAL - CULTURAL DESCRIPTION OF THE KENAI PENINSULA BOROUGH

History

Prior to the arrival of Russian fur hunters to the Kenai Peninsula in the latter part of the 18th Century, the region was populated by native people whose economy was subsistence based, utilizing the resources of the land and of the rivers flowing into Cook Inlet and the Gulf of Alaska. It is estimated that some 3,000 native people lived in the Kenai lowland area at the time of the first recorded contact by white man.

Several Russian trading companies were established, and by the end of the 18th Century had merged into a single large trading company called the Russian American Company. It was this company that controlled the entire region in 1867 when Alaska was purchased from Russia by the United States.

The mainstay of the economy of the Russian American trading company was fur trapping; however, because of poor management practices, the supply of fur-bearing animals was quickly depleted.

Gold was discovered in 1848 and during the late 1800's and early 1900's nearly every creek on the Kenai was prospected by miners.

The gradual establishment of a commercial fishing industry during the early part of the 20th Century brought some stability to the economy of the region.

The Second World War brought many changes to the region. An airport was built in the town of Kenai and a highway connecting the towns of Kenai, Seward and Anchorage was constructed. In 1947 the territory was opened to homesteading and there was an influx of new residents, mainly in the vicinity of the towns of Kenai, Soldotna and Homer. Farming was difficult and a viable agricultural industry did not develop.

In 1951, the U.S. Government built a small Air Force base at the Kenai airport. This created jobs and added economic stability. In 1957, oil was discovered on the north end of the Kenai Peninsula at Swanson River and an oil industry developed. The construction and operation of refineries north of the town of Kenai during the 1960's lead to rapid population growth and the development of a modern community in the Kenai-Soldotna area.

Kenai was incorporated as a city in 1960. Homer followed by incorporating in 1964, as did Soldotna in 1967. During the late 1950's the road system began to take shape. The Sterling Highway was gradually paved and all of the major towns and communities on the main part of the Peninsula were connected. The Kenai Peninsula Borough was incorporated in 1964.

Growth continued through the 1970's and 1980's as the refineries increased capacity and the commercial fishing industry prospered. Tourism became a very important segment of the economy, particularly on the Kenai River where people traveled from all over the world for a chance to catch a Kenai River King Salmon.

A forest products industry also developed. During the post World War Two era when homesteading and commercial fishing were the main economic activities of what is now the Borough, individually owned small sawmills were common in most communities and provided lumber for local construction projects. At Seward, the oldest city on the Kenai Peninsula (incorporated in 1912) and the southern terminus of the Alaska Railroad, Louisiana Pacific built and operated a sawmill and chipping operation during the 1970's. At Anchor Point, north of Homer, United Lumber, an Anchorage based lumber retailer, also operated a sawmill during the same time period. Near Tyonek, in the mid 1970's, a Japanese trading company built and operated a whole log chip mill. However, by the early 1980's, both sawmills and the chip mill had been closed and dismantled. Recently, the Chugach Alaska Regional Native Corporation constructed a large sawmill complex at Seward. This mill ran for 16 months and as of August, 1992, is not operating and is for sale.

Land ownership status

Unlike the rest of the United States, the ownership of a significant portion of Alaska's lands is still being decided. This is due in large part to the youthful age of the state; Alaska was granted Statehood in 1959 and is unique in the way in which land has been divided and ownership transferred through government allocation over a short period of time rather than through gradual settlement over a long period of time. Much of the land area in Alaska is still controlled by government. Within the Kenai Peninsula Borough, the Federal, State and Borough governments own and manage approximately two-thirds of the total land area.

In December, 1971, Alaska's native people (American Indians, Eskimos, and Aleuts) received a unique settlement from the Federal Government. To settle long standing disputes over land claims, 13 regional, four urban and some 200 village corporations were formed. Both the regional corporations and village corporations received monetary compensation and title to land. Any Alaska native person born prior to December 8, 1971, could enroll in both a village and a regional corporation. Most of the Kenai Peninsula Borough falls within the Cook Inlet Regional Corporation, although a portion of the eastern part of the Borough falls within the Chugach Regional Corporation. Eight native village corporations also own land within the Borough. Native land ownership within the Borough is 732,483 acres.

Other major land owners within the Borough include the Chugach National Forest with 900,000 acres, the Kenai National Wildlife Refuge with 1,200,000 acres, the State of Alaska with 600,000 acres and the Kenai Peninsula Borough with 90,000 acres. In addition, there is approximately 240,000 acres of private land within the Borough.

Local and regional government

The Kenai Peninsula Borough is one of 15 boroughs in the State of Alaska. It is empowered to carry out three main governmental functions - education, planning and zoning, and taxation. The Borough has an assembly form of government with an elected mayor along with a school board and a planning commission.

There are six incorporated cities within the Borough: Kenai; Kachemak; Homer; Seldovia; Seward; and, Soldotna. Numerous unincorporated communities and settlements also exist, including three native villages.

Population

The total population of the Kenai Peninsula Borough is 41,400. The most heavily populated region of the Borough is the Kenai-Soldotna area with approximately 25,000 people. The southern portion of the Borough, including Homer and the surrounding area, has a population of approximately 12,000, while Seward and the nearby areas on the east side of the Borough have a population of about 4,000. The population on the west side of the Cook Inlet is extremely low and is centered at the native village of Tyonek which has 248 inhabitants.

The average employment during 1991 indicated an available labor force of 18,799 with employment at 16,438. Unemployment during 1991 ranged from a low of 8.7% in July to a high of 17.5% in December. The annual average unemployment rate was 12.6% (from Kenai Peninsula Borough Economic Development District, Inc. 1991 Situation and Prospects, publication dated July, 1992).

Economy

The economy of the Kenai Peninsula Borough is based primarily on three industries: commercial fishing and processing; oil and gas; and, tourism.

Commercial fishing has been based primarily on the harvest of Cook Inlet salmon and continues to be a very viable industry with an estimated catch value of $16.7 million in 1991. In addition to being home port for a large number of commercial fishing vessels, the Borough also has numerous fish processing and cold storage facilities located at or near its ports. In recent years, a commercial ground fish industry has developed. Part of that fleet is now based in Kenai Borough ports. As on-shore processing facilities develop, the Borough expects to benefit from the growth of this industry.

The oil and gas industry may be characterized as being in its mature phase. Production peaked in the early 1970's and then declined to a stabilized annual production level of approximately 15 million barrels of crude oil and 300 billion cubic feet of gas. Three refineries, located in the North Kenai-Nikiski area, are currently in active production.

Tourism has grown steadily within the Borough. It is now estimated to be a $95 million per year industry. In addition to guided and non-guided sport fishing for salmon and halibut, hunting, backpacking and RV parks generate visitor revenue into the Borough's

economy. Recently, cruise ships from several lines have been calling at the Ports of Seward and Homer and this activity is expected to increase.

Schools and colleges

Each city and several of the unincorporated communities have public school Kindergarten through 12, all operated under the central administration of the Kenai Peninsula Borough School District.

Kenai Peninsula College, a part of the University of Alaska Anchorage system, has campuses in Soldotna and Homer. Alaska Vocational Technical Center is located in Seward and provides post-high school vocational training in a variety of fields.

DESCRIPTION OF FOREST PRODUCTS BUSINESS OPPORTUNITY WITHIN THE KENAI PENINSULA BOROUGH

Because of the large scale Spruce Beetle infestation within the Kenai Peninsula Borough, public timber owners with a mandate for multiple use are interested in selling timber to be harvested as soon as possible both to reduce fuel loads and fire danger in areas of high mortality, and to slow the advance of the Spruce Beetle infestation which is moving generally southward on the Kenai Peninsula. Many private timber owners are also interested in selling their timber for the same reasons.

There is also widespread support for new industry within the Borough to create jobs for residents and to add additional stability to the Borough's work force. The effort to attract forest products business to the Borough has been facilitated by the work of the Kenai Peninsula Borough Timber Resources Utilization Task Force, a citizen advisory group made up of local business people, several of whom have experience in the forest products industry. The chairman of the group, Mr. John Torgerson, was General Manager at the Louisiana Pacific Seward operation until its closure in the early 1980's. Mr. Torgerson and the Task Force have been instrumental in providing guidance and ideas to the Borough's Economic Development District and its consultants on matters relating to the development of a viable forest products industry in the Kenai Peninsula Borough.

Up to 690,500 acres of timber are potentially available. Some of this timber is of a very low grade due to its form, roughness and the mortality caused by the bark beetle; however, certain stands of the beetle-kill timber may contain low grade sawlogs, which can be recovered through merchandising at the time of harvest. The utility log component of this timber is, for the most part, sound and makes an excellent chip furnish for pulp or reconstituted panels.

A company specializing in mechanized harvesting and in-woods chipping has secured the cutting rights to approximately 30,000 acres of native owned timber on the south central portion of the Kenai Peninsula. This company and an export trading company plan to construct a chip receiving and ship loading facility on the Homer Spit, which is located at the southern end of the Peninsula. This chip handling facility is to be built on

City of Homer land adjacent to the City's deep water dock and will be available to other users on a fee basis.

In addition to this chip handling facility, other options exist for the shipment of logs, chips and lumber or other finished products out of the Kenai Peninsula Borough. The Port of Homer has a deep water dock and logs have been inventoried and loaded onto ships and ocean going barges. To the north, near the industrial areas of North Kenai and Nikiski, there are existing docks that have the capability to handle chips and logs. The Port of Seward is the southern terminus of the Alaska Railroad. It is the receiving point for many of the containerized and roll-on/roll-off movements to Southcentral and Interior Alaska as well as the loading port for Alaska coal. Log cargos have been accumulated and shipped from the Port of Seward. In addition to these port facilities, there are numerous sites available in applicably zoned areas where chip mills, sawmills, treating plants and other wood product manufacturing plants could be sited.

TECHNICAL FACTORS RELATED TO FOREST PRODUCTS OPERATIONS

Commercial timber and ground characteristics

In terms of operability and equipment selection, the commercial timber within the Kenai Peninsula Borough may be described as being very suitable for fully mechanized harvesting. Most of the ground is flat to moderately sloping and few stems are larger than 24" in diameter at ground line. Volumes per acre of spruce on commercial category lands range from 10-12 mbf (Scribner Dec. C. single segment scale) on the highest site ground downward to volumes of 3.5-4 mbf. In many areas, birch and aspen occur as a component species within spruce stands. Kenai area spruce is generally shorter with more rapid taper when compared to interior white spruce and coastal Sitka spruce. The hardwoods generally comprise less than twenty five percent of the volume of stands typed as spruce and are often clumped, particularly in the case of the birch. Kenai hardwood, while not of an exceptionally high grade may present an opportunity for utilization as a pulp species, as a furnish for reconstituted lumber or panel products, or as bolts for hardwood lumber products.

The ground underlying the commercial timberlands of the Kenai Peninsula Borough does require special consideration. Soft areas of wet, high organic content soils without a firm base can present problems for summertime operations of logging equipment. In general, the solution has been to locate and define each type of area and operate on the wet ground when it is frozen during the winter months.

Road building does not require the high cost rock drilling and blasting techniques often required in Southeast Alaska. Gravel is usually available within reasonable distances to road headings.

In general, the logging and road building considerations within the Kenai Peninsula Borough are similar to conditions in the north central states of the U.S. (Minnesota, Michigan, etc.) but with a different species mix. The area lends itself to modern mechanized harvesting.

Roads and highways

Access to and from the Kenai Peninsula is via Alaska Highway One, the Seward Highway. At a major road junction some 100 miles south of Anchorage, the Seward Highway becomes Alaska Highway Nine and continues to Seward some 40 miles further to the south. Highway One heads west and is called the Sterling Highway. At Soldotna, 57 miles west of the Seward Highway-Sterling Highway junction, the Sterling Highway turns south and runs parallel to the west shore of the Peninsula, terminating at Homer. Also at Soldotna, another highway heads northwest to Kenai and then northward to the North Kenai-Nikiski industrial area. All of these highways are two -lane, blacktop roads with travel surfaces that range in width from 24 to 32 feet. In several locations, passing lanes on adverse grades have been added. A major realignment and reconstruction project is ongoing on that portion of the Sterling Highway between the communities of Sterling and Soldotna.

Some 75 miles of secondary roads accessing the commercial timber within the Borough are in place, but the large scale harvesting program which is being planned by the Task Force and the various timber owners will require construction of additional roads.

Traffic on Kenai Peninsula highways may be described as seasonal, with the heaviest flows corresponding to the visitor season which starts in May and ends in September. The heaviest traffic is on that portion of the highway system that links Anchorage with the Soldotna-Kenai area. Traffic during the summer seasons often includes recreational vehicles and vehicles towing boats. Travel speeds are sometimes slowed due to bunching of vehicles. South of Soldotna, the Sterling Highway has less traffic and in general higher summer average speeds than along the Anchorage to Soldotna corridor.

Night hauling may be one alternative to driving during peak summer traffic flows. Summer night hauling would, of course, be facilitated by the long hours of daylight during this season.

Roads are well maintained all through the winter months. Winter plowing on all Kenai Peninsula Highways is the responsibility of the State of Alaska Department of Transportation. Secondary roads are maintained and plowed by the Kenai Peninsula Borough, generally with an emphasis on school bus access. Roads accessing areas extending beyond residences into the commercial timber areas would have to be maintained and plowed by the operator.

During spring break-up, weight limits and restrictions are usually applied to protect the structure of the roads and prevent damage from traffic. These weight limits are 75% of full load and restrictions usually last four to five weeks.

Truck rules and regulations

Truck length and gross weight restrictions in Alaska are somewhat different and, in most cases, more permissive than other states. The standard width limit is 8'6" and maximum height is 14'0". Maximum overhang is 4'0" rear and 3'0" front. Tractors

with trailers have a maximum allowed overall length of 70'0", although overlength permits may be obtained on a case by case basis.

Gross weights are governed solely by wheelbase as measured from center of the front or steering axle to center of the rearmost axle. A typical west coast type log truck permitted to gross 78,000 lbs. in Washington, or 80,000 lbs. in Oregon, with five axles, could theoretically gross up to 89,500 lbs. in Alaska. However, to achieve that weight, the wheelbase would have to be 66' and the overall length 70'. In actual practice, log trucks set up to bunk 35 to 40 foot logs, loaded with 4' of overhang, can haul with allowable gross weights of 84,000 to 86,000 lbs.

Chip trucks using tractors with three axles and trailers with two axles can haul legal gross weights of up to 89,500 lbs. if the wheelbase is 66' and the overall length 70'. An additional axle adds 4,000 lbs. to the allowable gross weight.

Power availability

Electrical power is widely available throughout those portions of the Kenai Peninsula Borough accessible by road. The primary supplier of power on the Kenai to private, commercial and industrial customers is the Homer Electric Association (HEA), a rural electric cooperative. Chugach Electric Association supplies power in the Cooper Landing area and the City of Seward Electric Department supplies power in and around the City of Seward.

Work force

The Kenai Peninsula Borough has a work force of approximately 18,000, with total employment in the 16,500 range. The Greater Anchorage Area has a population of approximately 250,000, with a work force estimated to be 105,000. Within this work force is a large pool of experienced equipment operators, truck drivers, mechanics and welders, due in large part to the labor needs of the numerous construction and resource development projects that have been a significant part of Alaska's economy during the 1970's to the late 1980's. In addition, there is a significant pool of skilled workers available in southeast Alaska. Many of these individuals have experience in the forest products industry of that region and would be willing to relocate to the Kenai Peninsula Borough for a stable employment situation.

Taxes

State of Alaska and Kenai Peninsula Borough taxes that would apply to a forest products operation located in the Borough may be summarized as follows:

1.) Harvesting Operations

a.) There is not a separate ad valorem tax on standing timber nor a State or Borough timber severance tax; and,

b.) There is a personal property tax levied by the Borough and by most cities within the Borough that applies to timber harvesting and construction equipment that is not titled and licensed to travel on public roads. The personal property tax rate ranges from 8.55 mils to 16.3 miis with an average rate within the Borough of 12.0 mils;

2.) Transportation

a.) There are no road use taxes levied by the State or Borough on commercial trucks transporting goods or commodities on Alaska roads; and,

b.) Truck licensing fees are assessed in two parts - an annual registration fee, which is $156 for each truck or trailer with an unladen weight of 12,001 to 18,000 lbs., and $221 for 18,001 lbs. and over. There is also an annual tax which ranges in approximately $20 increments per year downward from $150 for 12,001 to 18,000 lb. weight category vehicles and $200 for 18,001 lb. and over vehicles which are new ('92 - '93) to $20 for 1985 and older trucks or trailers;

3.) Conversion Facilities

Conversion facilities, such as sawmills, stationary chip mills and other processing equipment, will be taxed as real property if permanently installed, or as personal property, if mobile, at rates which are the same as those discussed in l.b., above;

4.) Wages and Salaries

Alaska does not have a state personal income tax at this time;

5.) Corporate Income

The State of Alaska taxes corporations at the rate of 9.4% of corporate taxes paid to the federal government; and.

6.) Sales Tax

The State does not have a sales tax, but the Kenai Peninsula Borough and most cities within the Borough levy sales tax on retail sales of goods and services. The Borough rate is 2% and the city rates are 3 to 3 1/2%. Sales tax is collected only on the first $500 of each transaction.

Alaska Forest Resources and Practices Act and
other laws related to timber harvesting

Enacted in 1978, and in effect since January 1, 1979 the Alaska Forest Resources and Practices Act (FPA) covers all matters related to timber harvesting, log movement, road construction and reforestation. The Act was revised by the Alaska legislature in 1990 .

In general, the Act requires that prior to commencement of operations an operating plan be submitted to the Division of Forestry. The Division reviews the plan and acts as the lead agency for the purpose of contacting other applicable agencies. In most cases, response time is thirty days or less and start-up may begin upon notice from the Division of Forestry or the expiration of 30 days.

The Borough falls within two regions under the FPA; Region #1 - the Moose Pass/Seward area and the south side of Kachemak Bay, and Region II - the remainder of the Borough.

Partial cut areas must meet a minimum stocking level or a combination of residual trees and seedlings to meet the reforestation requirements. Clearcut areas must be restocked to at least 200 seedlings per acre in Region I within five years of harvest, and to 450 seedlings per acre in Region II within seven years of harvest. Variations from these requirements can be applied for on a site specific basis.

Harvesting of stands that are "significantly" composed of insect killed trees are exempt from the reforestation requirements. The Division of Forestry is still defining the situations where this exemption will apply.

Other agencies with jurisdiction over timber harvesting and road construction are the Alaska Department of Fish and Game which has jurisdiction over the wetted perimeter of streams and other waters and the Department of Environmental Conservation which has jurisdiction over water quality, solid waste and air quality. Fish and Game is the agency responsible for reviewing culvert and bridge design criteria and placement, primarily to insure fish passage. Environmental Conservation is primarily concerned about sedimentation and spills of hazardous or toxic materials. This agency also has jurisdiction over disposal of log yard debris.

Permits for centralized processing facilities such as chip mills or sawmills would be handled by the State of Alaska Office of Governmental Coordination, which assists applicants proposing to construct new industrial facilities within the State where a variety of permits are often required.

ADDRESSES OF LOCAL, BOROUGH, STATE AND FEDERAL AGENCIES

Local

City of Homer
491 E. Pioneer Ave.
Homer, AK 99603
(907) 235-8121

City of Kenai
210 Fidalgo
Kenai, AK 99611
(907) 283-7530

City of Seward
5th & Adams
Seward, AK 99664
(907) 224-3331

City of Soldotna
177 N. Birch
Soldotna, AK 99669
(907) 262-9107

Borough

Kenai Peninsula Borough
144 N. Binkley
Soldotna, AK 99669
(907) 262-4441

Kenai Peninsula Borough
Economic Development District , Inc.
110 S. Willow Street, Suite 106
Kenai, AK 99611-7744
(907) 283-3335

State

Alaska Department of Commerce & Economic Development
Division of Economic Development
3601 C Street, Suite 724
Anchorage, AK 99503
(907) 563-2165

Alaska Department of Commerce & Economic Development
Division of Commerce - Weights & measures
Soldotna Office (907) 262-3853
Sterling Weigh Station (907) 262-5400

Alaska Department of Environmental Conservation
35390 Kalifonsky Beach Rd., Bldg. E
Soldotna, AK 99669
(907) 262-5210

Alaska Department of Fish & Game
34828 Kalifonsky Beach Road
Soldotna, AK 99669
(907) 262-9368

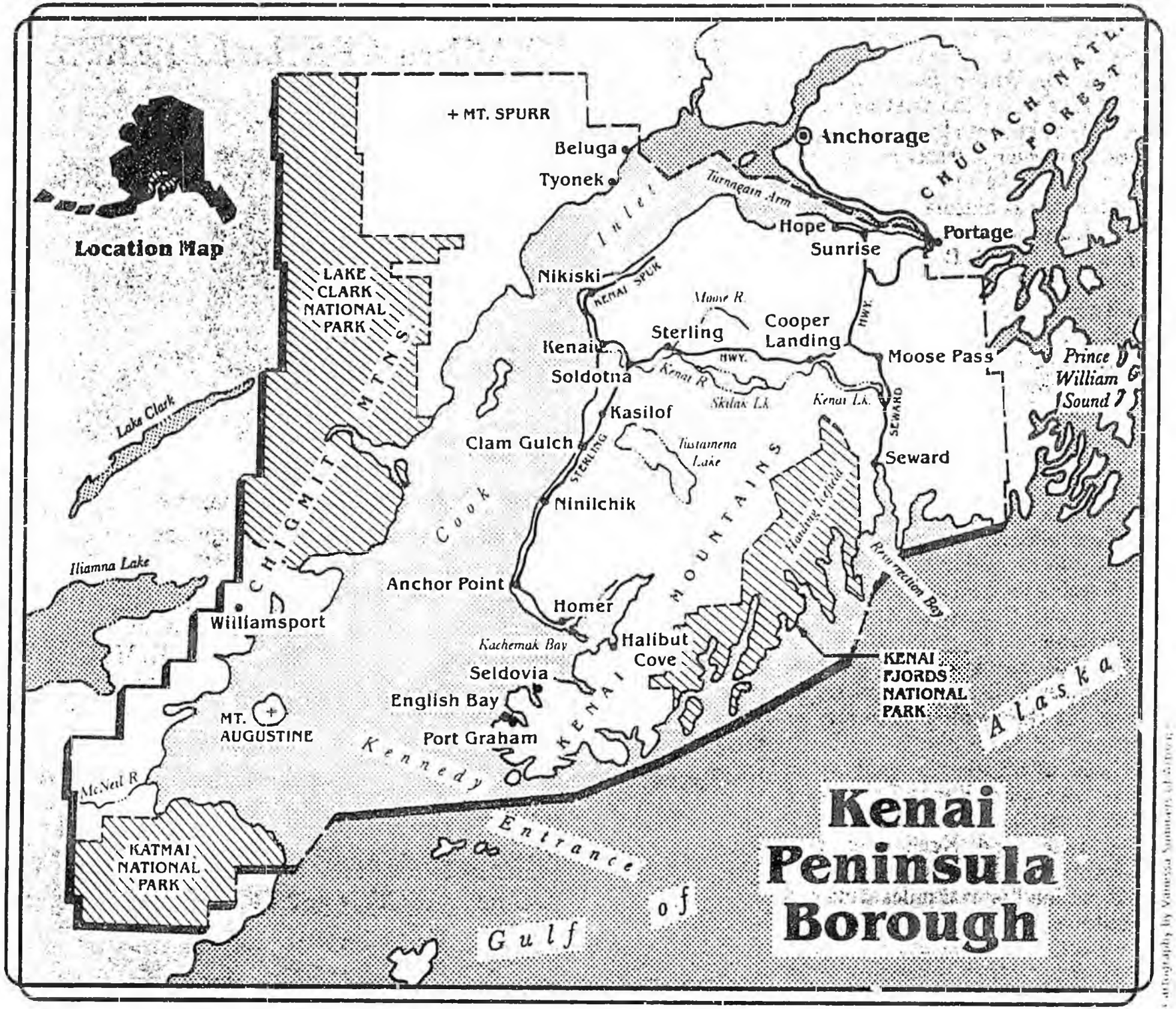
Office of Governmental Coordination
3601 C Street, Suite 307
Anchorage, AK 99503
(907) 561-6131

Alaska Department of Natural Resources
Division of Forestry - Kenai Area Office
HC1, Box 107
Soldotna, AK 99669
(907) 262-4124

Federal

Chugach National Forest - Seward Ranger District
P.O. Box 390
Seward, AK 99664
(907) 224-3374

Chugach National Forest - Supervisor's Office
201 E. 9th Avenue
Anchorage, AK 99501
(907) 271-2500



Map provided courtesy of Alaska Business Monthly magazine, (c) 1992

Cartography by Vanessa Sommers of Alaska

PART TWO

DIRECTORY OF TIMBER OWNERS

DIRECTORY OF TIMBER OWNERS WITHIN THE KENAI PENINSULA BOROUGH

This listing of timber owners is presented in two sections: the Public Owners Section, which includes governmental entities within the borough with management authority over the commercial timber; and a Private Owners Section which includes all private owners of commercial timber who have expressed an interest in being contacted. These listings are designed to be a starting point for a buying program. In the case of most of the public owners, preparations for timber sales are ongoing and will be completed during the fall of 1992 with sale offerings late in 1992 and during the first half of 1993. Private owners interested in listing timber for sale were identified after responding to direct contact by the Economic Development District. The listing of a private timber owner in this Directory in no way obligates the timber owner to sell timber nor does it obligate anyone to contact the timber owner. This Directory was prepared as a service to public and private timber owners within the Kenai Peninsula Borough, and to facilitate the establishment of timber harvesting operations within the Borough in an effort to stop the spread of the Spruce Beetle infestation.

This Directory was compiled by the Kenai Peninsula Borough Economic Development District, Inc. (EDD) from information provided by timber owners. The accuracy of this information, e.g., total acres of ownership, acres of timber, volume, quality, species composition, has not been checked by the EDD. It is likely to vary depending upon actual knowledge and interpretation by each timber owner.

NOTE: **Vegetation and Land Ownership maps are available by request from:**

Kenai Peninsula Borough
Economic Development District, Inc.
110 S. Willow St., Suite 106
Kenai, AK 99611-7744
Phone: (907) 283-3335
Fax: (907) 283-3913

PUBLIC TIMBER OWNERS

NAME AND CONTACT ADDRESS	DESCRIPTION
USDA FOREST SERVICE CHUGACH NATIONAL FOREST SEWARD RANGER DISTRICT P.O. Box 390 Seward, AK 99664 (907) 224-3374 Duane Harp, District Ranger	The Forest Service is preparing a sale of approximately 2 mmbf of beetle-killed spruce in the Cooper Landing area. Bidding will be by sealed bid. Marine line access roads are currently under construction. A sale of approximately 12 mmbg in the same area is planned for June, 1993. Most of this timber has been dead for 8+ years and suitable only for chips or hog fuel. Additional beetle-killed timber in the Cooper Landing area may become available by the summer of 1993. In addition to this salvage sale program in the Cooper Landing area, the Chugach National Forest has an annual allowable cut of .5 mmbf, although most of this volume is allocated to personal use firewood sales.
STATE OF ALASKA DEPARTMENT OF NATURAL RESOURCES DIVISION OF FORESTRY HC 1, Box 107 Soldotna, AK 99669 (907) 262-4124 Jim Petersen Area Forester	30,000 acres available. Property is located in the Kasilof, Clam Gulch, Ninilchik, Fox River, and Kalifin Island areas. For specific location contact the Area Forester. Any sales must be developed according to State law. State will not guarantee volumes available. State will not provide access. Purchaser will prepare a project harvest plan and an annual operating plan which must be approved by the division prior to road construction and harvest. Purchaser must comply with the Alaska Forest Resources and Practices Act. Purchaser would be responsible for locating State property boundaries.
KENAI PENINSULA BOROUGH 144 N. Binkley Soldotna, AK 99669 (907) 262-4441 ext. 267 John Mohorcich Land Management	33,700 acres available. Locations are scattered throughout the Borough with portions accessible by road.

U.S. DEPARTMENT OF INTERIOR
FISH AND WILDLIFE SERVICE
KENAI NATIONAL WILDLIFE REFUGE
P.O. Box 2139
Soldotna, AK 99669
(907) 262-7021
Dan Doshiere
Refuge Manager

The Kenai National Wildlife refuge does not have a timber sale program at this time; however, Fish and Wildlife Service resource specialists are working with the Kenai Peninsula Borough Timber Resource Utilization Task Force to determine if a limited sale and harvesting program could be useful in reducing the spread of the Spruce beetle infestation.

UNIVERSITY OF ALASKA
2221 E. Northern Lights Blvd.
Anchorage, AK 99508
(907) 346-1455

The University of Alaska has management authority over its lands. It has approximately 15,000 acres of commercial timber for sale within the Kenai Peninsula Borough. Location information available on request. Land is accessible by road and is spruce/birch.

PRIVATE TIMBER OWNERS - NATIVE CORPORATIONS

NAME AND CONTACT ADDRESS	DESCRIPTION
NINILCHIK NATIVE ASSOC., INC. 2600 Cordova, Suite 204 Anchorage, AK 99503 (907) 277-2527	Various parcels, over 50,000 acres; spruce, birch, aspen/cottonwood; accessible by road; impacted by spruce bark beetles. Contact owners for details.
SELDOVIA NATIVE ASSOC., INC. P.O. Drawer L Seldovia, AK 99663 (907) 234-7625	50,000+ acres; 60% spruce, 30% birch, 10% aspen/cottonwood; non-accessible by road; non-impacted by spruce bark beetles.
TYONEK NATIVE CORPORATION 1689 C Street, Suite 219 Anchorage, Ak 99501 (907) 272-0707 (907) 274-4125	1500-2000 acres; various locations; Kenai Wildlife Refuge; spruce, birch, hemlock; accessible by road; non-impacted by spruce bark beetles. Contact owner for further details.

PRIVATE TIMBER OWNERS - OTHER PRIVATE

NAME AND CONTACT ADDRESS	DESCRIPTION
DOUG ANDERSON Rt. 1, Box 109 Kenai, AK 99611 (907) 776-8121 ext. 3824 (907) 283-4163	17 acres; Lot 298, Moose Mt. Sub; spruce, birch, hemlock aspen/cottonwood; non-accessible by road; impact by spruce bark beetle unknown; must leave access road or trails in place and minimize disturbance to landscape.
SHIRLEY ANDERSON P.O. Box 91886 Anchorage, AK 99509 (907) 333-0341	159+ acres; TO6NR11WS06, Gvmt Lots 1 & 2 & S1/2, NE 1/4, CNTG 15; partially accessible by road; impact by spruce bark beetles unknown.
GORDON L. BAILEY 2006 Ashland Avenue Santa Monica, CA 90405 (310) 450-7717	85 acres; Tax ID #s 16572009-5, 16572008-7; 95% spruce, 5% aspen/ cottonwood; accessible by road; some impact by spruce bark beetles; desires selective cutting, small amount of clearcutting with owner's permission.
RAY BOUWENS 3307 Boniface 9A Anchorage, AK 99504 (907) 337-1099	Two parcels: parcel #1 near existing timber access roads of Ninilchik Native Assoc.; T01SR12WS27 SE 1/4 NW 1/4 N. of seismograph R/W exc. streets cntg 36 acres. Parcel #2 parents homestead; Bouwens Sub.; tract 9 cntg 10 acres. 75% spruce, 20% birch, 5% cottonwood. Non-impacted by spruce bark beetle. Selective cutting and damage control; possible trade for permanent improvements.
ROBERT C. BOYLES 840 Noles Drive Mt. Holl, NC 28120 (704) 827-7171 (704) 827-0860	Lot 139, Graycliffs Subd. 15.8 acres consisting of spruce, birch, hemlock and aspen/cottonwood; impacted by spruce bark beetle, unknown; three acres that immediately surround existing cabin to be left untouched.
AMELIA & HARRY CHRISTIAN 901 W. Tudor Anchorage, AK 99503 (907) 561-0927	Approximately 160 acres T4N, R11W, S10, NW1/4; Tax #13104113-9; 80% spruce 10% birch, 10% aspen/cottonwood. Impact by spruce beetle unknown.

JENNIE T. COBURN, CECIL THAD COBURN & MADISON CHRISWELL COBURN 120 Boulevard Shreveport, LA 71104-2504 (318) 222-4044	12.53 m/l. Parcel #T10NR08WS27 KN840065 Moose Point sub; lot 159. Parcel TCA53 Nikiski, Parcel #025-443-0100. Kinds of timber unknown; non-accessible by road; non-impacted by spruce bark beetles.
MR. & MRS. CHESTER H. CONE P.O. Box 263 Kenai, AK 99611 (907) 283-7950	100 acres; NW 1/4 of NW 1/4, S10, T5N R11W, & Tracts 6 & 7 of River Bend Sub., Sec. 11, T5N R11W. 60% spruce, 30% birch, 10% aspen/cottonwood; impacted by spruce bark beetles; accessible by road: no clearcutting; cut only beetle killed spruce, some birch and some cottonwood.
ALEXANDER CONNORS 2001 Stonegate Circle Anchorage, AK 99515 (907) 269-4773 (907) 344-3270	30 acres timbered land; S3, TS45, R10W, Seward Meridian; 38 acres on bluff above the Fox River; this lot is almost in the middle of Sec. 3; 90% spruce, 5% aspen/ cottonwood; non-impacted by spruce bark beetles; access is difficult.
LOUISE CRANE 4101 University Drive Anchorage, Ak 99508 (907) 569-2273 (907) 563-0228	175 acres; S1/2, NW1/4, N1/2, SW1/4, Sec. 28. S1/2, NE1/2, SE1/4, Sec. 29, T4S, RNW, Seward Meridian. 100% spruce; accessible by road; unknown if impacted by spruce bark beetle.
MARY MABRY DEPAOLI 1275 S. Marsh Avenue Reno, NV 89509 (702) 322-0522	Approximately 280 acres; T06S, R27W & T06SR2SW, Silver Creed M5869, CNTL 140 ac m/1. Half property in Kenai Borough; kinds of timber unknown. Contact owner for details.
GAIL DUNCAN 3081 Brookview Anchorage, AK 99504 (907) 338-1700	100 acres; +/-90% spruce, +/-10% birch & aspen/cottonwood.
AUDREY ANNETTE GATZ & JOAN KAY HASHIMI R2-1513 Adams Rd. East Troy, WI 53120 (414) 495-8616	80 acres; Parcels #T05SR13WS18 & #T05S13WS17; spruce and birch; non-accessible by road; spruce bark beetle damage unknown
A.M. GRANAT P.O. Box 5542 Bellingham, WA 98227 (206) 592-2456 (206) 676-9635	40 acres; T04SR14W505 SE 1/4 NE /14 cntg. 75% white spruce; hemlock; impacted by spruce bark beetle; non-accessible by road.
ESTATE OF A.M. EVANCOE 109 Melvin St. Washington, Ill. 61571-2612 (309) 444-3824 Eugene or Olive Evancoe	115 acres Homer; 40 acres at Kenai; Several tax ID #'s available; some accessible by road; 90% spruce, 5% birch, 5% aspen/ cottonwood; requires professional tree removal. Contact owner for details.

LEO & MARGUERITE FRELIN 3737 W. 100th Avenue Anchorage, AK 99515 (907) 344-2430	110 acres; tax ID #159-140-2200 & 159-140-2100; T3SR14WS19 E 1/2, NW 1/4 & Gvmt Lots 2 & 3 W. of Sterling Highway (81 acres W. of Sterling Highway & 53 acres E. of Sterling Highway.
IRENE GIRVES Box 327 Soldotna, Ak 99669 (907) 262-1846	Halcyon Sub., Addn. 3, 4, 5, 7, Soldotna; 200 acres; mixture of spruce birch, aspen/ cottonwood; accessible by road; non-impacted by spruce bark beetles.
PETER O. HANSEN P.O. Box 1390 Kenai, AK 99611 (907) 283-4611 (907) 283-4615	160 acres; 80% spruce, 10% birch, 10% aspen/cottonwood; non-impacted by spruce bark beetles. Contact owner for details.
WILLIAM P. JAMES 19111-H-DesMondes Way So. Seattle, WA 98148 (206)246-7989	1/2 40 acres; T4S, R15W, S11, SM, NE 1/4, SE 1/4; accessible by road; impact by spruce bark beetles unknown.
RANDEL JONES 33525 East End Road Homer, AK 99603 (907) 235-6284	25 acres; mi. 18 East End Rd., Homer; accessible by road; impacted by spruce bark beetles. Contact owner for details.
THOMAS E. KELLY The Highlands Seattle, WA 98127 (206) 546-8982 (206) 367-7005	600 acres; 70% spruce, mixture birch, hemlock, aspen/cottonwood; non-accessible by road; tributaries of N. Fork of Anchor River head on property and are salmon spawning streams; non-impacted by spruce bark beetles. Contact owner for more details.
BERNARD & ELIZABETH LA MOTTE 4510 58th Avenue, N. #109 Brooklyn Center, Mn. 55429 (612) 535-8743	Several locations; Sec. 4, T5S, R15W, SM, PTN SW 1/4, NW 1/4, lying NW of Intern Island County 00.57 ACM/L. Parcel #169-330-0300 mineral rights on this property; SW 1/4, NW 1/4, lying easterly of Silver King Wayside; Intern Island located in Section 4; Township 5 South; Range 15 West, Seward Meridian. Contact owner for details.
JOHN W. LEONARD P.O. Box 285 Kasilof, AK 99610 (907) 262-5679	30 acres, spruce, Mouse Pt. Sub. #86, Kenai Rd.; non-accessible by road; impacted by spruce bark beetles. Contact owner for details.

W.A. LESHER
HC 67, Box 902
Anchor Point, AK 99556
(907) 235-7954

Approximately 9.5 mi. from Anchor Point by North fork Road; approximately 500 full length green logs limbed and stacked in '91 and '92; accessible by road; non-impacted by spruce bark beetles; logs must be paid for in full before leaving property; take all or part.

MARVEL J. & ISIDORA KOBS
5391 Tudor Top Circle
Anchorage, AK 99507
(907) 562-7595

60 acres; 80% spruce, 10% birch and hemlock; 159-012-4300 NE 1/4 of S9, R14W, Homer Rec. Dist; accessible by road; impacted by spruce bark beetles; leave good amount of young trees; leave some sections of trees standing as designated by owners.

JAMES L. LOWERY
ROYCE V. CANTRELL
P.O. Box 653
Highland, CA 92346
(714) 864-2480
(714) 884-2082

33 acres; Parcel #066-340-2000; TR 3 House Sub Tract 3 K84-91; accessible by road; timber involved unknown; non-impacted by spruce bark beetles.

LINDA & MICHAEL MCLANE
P.O. Box 769
Kasilof, AK 99610
(907) 262-4613
(907) 283-4218

100-120 acres; Loon Lake Sub.; 60% spruce 20% birch, 20% aspen/cottonwood; some accessible by road; impacted by spruce bark beetles; special considerations listed as none.

DOROTHY L. MORRIS
2816 Essex Circle
Woodward, OK 73601
(405) 254-3976

Not sure of acreage; tax code area 65, #15713005-5; timber involved unknown; contact owner for details.

CLYDE & KATIE MOREHOUSE
17 Marborough Rd.
Shalimar, FL 32579
(904) 651-1144

Approximately 30 acres; Grey Cliff 358; 90% spruce; non-accessible by road; non-impacted by spruce bark beetles; see owner for details.

MICHAEL E. MURPHY
P.O. Box 10281
Fairbanks, AK 99710
(907) 873-1132
(907) 895-4234

40 acres of 80; NE 1/4, SW 1/4, NW 1/4, SE 1/4, S20T5S, R14W, SM; non-accessible by road; non-impacted by spruce bark beetles.

THEOPHILUS G. MUMCHUCK
P.O. Box 100940
Anchorage, AK 99510
No phone listed

Spruce, birch, aspen/cottonwood; non-accessible by road; impact by spruce bark beetles unknown.

CURTIS OLSON
Box 9-1364
Anchorage, AK 99509
(907) 561-1651
(907) 235-7396/5107

30 acres spruce/birch; T07NR12SS34 Lots 18, 19, 20, 21, 22 and those PTNS of Lots 16, 17, 23 lying E. of N. Kenai Rd.; accessible by road; impact of spruce bark beetle unknown.

GARY OSKOLKOFF P.O. Box 63 Ninilchik, AK 99639 (907) 567-3313 (907) 567-3955	76 acres, various locations, 90% spruce; 10% birch; accessible by road; non-impacted by spruce bark beetles. Contact owner for details.
PACIFICCORP 700 NE Multnomah, Suite 700 Portland, OR 97232 (503) 731-2046	133 acres; various lots 1-24, B10 & B9, Parcel G, all Bayview Addn; some N. of Seward High School site, some W. of Forest Acres Sub; accessible by road; impact by spruce bark beetle unknown. Contact owner for details.
DONALD G. PRIOR 203 S. 77th Ave. Yakima, WA 98908 (509) 966-3926	Unsure of acreage. NE 1/4 SW 1/4 sec. 12, T6N R12 WSM; birch and pine; unsure of impact by spruce bark beetle. Lot listed for sale by RE/MAX.
HERBERT D. & CAROL J. STICKNEY 10920 Katlian Dr. Eagle River, AK 99577 (907) 564-3010 (907) 694-8982	13 acres; Gray Cliff Sub., Lot 225; spruce/birch; non-accessible by road. Contact owner for further details.
ERV TERRY, PARTNER P.O. Box 190228 Anchorage, AK 99519 (907) 243-1380 (907) 333-8268	Approximately 75 acres; spruce; located next to Sear Elementary School, Kenai; impact of spruce bark beetles unknown. Contact owner for further details.
JESSE B. & MARY E. TOOKE 380 W. Rockwell Avenue Soldotna, AK 99669 (907) 776-8197 (907) 283-6262/2264	30 acres; spruce; Tax #18549606-4; non-accessible by road; non-impacted by spruce bark beetle; stumps & brush to be pushed into one pile.
RONALD J. & MARILYN L. WELLS 790 S. Juniper St. Pineville, OR 97754 (503) 447-5710 (503) 447-1410	10.5 acres, 1147, Gray Cliff Sub., Kenai; timber involved unknown; non-accessible by road except by beach; impact of spruce bark beetles unknown. contact owner for further details.
WALTER E. & MONA L. WENTZEL Box 39182 Ninilchik, AK 99639 (no phone listed)	Two 40 acre blocks; spruce/birch; several locations, Ninilchik; accessible by road: impacted by spruce bark beetles. Contact owner for location and details.
BILL B. WILLIAMS, JR. 23003 E. Eudie Otis Orchard, WA 99027 (509) 926-6000 (509) 929-8005	90 acres; E. of Tract D of Doyle Estates, 1st addn; mixture spruce, birch hemlock, aspen/cottonwood; accessible by road; impact by spruce bark beetles unknown; no damage to property.

BRUCE & LINDA WILLARD
40520 Waterman Rd.
Homer, AK 99603
(907) 235-8830

500 acres; various locations; 95% spruce; non-accessible by road; non-impacted by spruce bark beetles. Contact owners for details.

MARION E. WILLIAMS
P.O. Box 287
Kasilof, AK 99610
(907) 262-1210

3.5 acres; Assessor Parcel #R-137-022-38; spruce; accessible by road; impacted by spruce bark beetles.

PRODUCT & MARKET FEASIBILITY REPORT FOR COMMERCIAL TIMBER RESOURCE UTILIZATION PROGRAM

PREPARED BY:

ASK* Marketing and Research Group
and
University of Alaska Anchorage
Alaska Center for International Business

FOR:

Kenai Peninsula Borough
Economic Development District, Inc.
110 South Willow Street, Suite 106
Kenai, Alaska 99611-7744
Tel: (907) 283-3335
Fax: (907) 283-3913

Funding for this document has been provided by:
U.S. Department of Agriculture, United States Forest Service;
Alaska Department of Commerce and Economic Development, Division of Economic Development; and
Kenai Peninsula Borough Economic Development District, Inc.

110 S. Willow St., Suite 106 • Kenai, Alaska 99611 • (907) 283-3335 FAX (907) 283-3913

KENAI PENINSULA BOROUGH
ECONOMIC
DEVELOPMENT
DISTRICT, INC.

TO REPORT READERS:

The enclosed report was prepared by a consultant for the Kenai Peninsula Borough Economic Development District, Inc. (EDD) to be used in the work of the Kenai Peninsula Timber Resource Utilization Task Force. While the findings and recommendations of the report are those of the authors, this material was intended for use in formulating strategies and recommendations of the Task Force to be reported to the Borough Assemoly and in the design and development of the EDD's work program. The newly formed Timber Resource Utilization Committee of the EDD intends to use these documents to continue the work toward the accomplishment of this mission.

James A. Elson

James A. Elson, Chairman

PRODUCT & MARKET FEASIBILITY REPORT FOR COMMERCIAL TIMBER RESOURCE UTILIZATION PROGRAM

* Summary & Recommendations
* Industry Structure
* Products
* Markets - Domestic
* Markets - International
* Appendices

TABLE OF CONTENTS

TABLE OF CONTENTS
(continued)

1. SUMMARY AND RECOMMENDATIONS

1.1 Background

ASK* Marketing and Research Group and the University of Alaska Anchorage Alaska Center for International Business (ACIB) were engaged by the Kenai Peninsula Borough Economic Development District, Inc. (EDD) to provide information concerning product and market opportunities which may be available in connection with the Timber Utilization Program.

Information was gathered through extensive literature searches, international trade data, and personal discussions. A partial bibliography is included in the Appendix.

An extensive list of domestic and international forest and wood product manufacturers has been submitted separately from this report.

1.2 Resource Base

In 1987, the total timber resource on the Kenai Peninsula was estimated to be approximately 3.67 billion board feet. (van Hees and Larson, 1987.)

Research is now underway to determine the extent of dead and spruce beetle-infested timber. Actual product opportunities will depend much on the quantity and quality of the available timber. In addition to extensive timber resources, the Kenai Peninsula has excellent utility, truck, rail, and port access. It is also in close proximity to two-thirds of the state-wide population base which resides in Southcentral Alaska.

According to one recent estimate based on acreage, out of 3,249,959 acres of forestland (excluding major bodies of water), 409,045 acres, or 12.6% of the total acreage, were considered infested. (Summer 1992; Alaska Department of Natural Resources for the Western Kenai Peninsula and Kalgin Island)

1.3 Highlights of Findings

Domestic and international markets present good opportunities for Alaska-based producers.

Likely increases in demand, in combination with reduced Lower-48 and Canadian supplies and subsequently increasing prices, suggest good opportunities for Alaska timber products to be sold to paper companies, furniture manufacturers, log home builders, and retailers of gift and decorative items.

Low stumpage rates may be needed to help make Kenai Peninsula products more competitive.

To be competitive in U.S. markets, Kenai Peninsula processors must manufacture high value products that offset the impact of high freight rates.

In 1991, Alaska wood product exports totaled $537.8 million. They consisted

of $161 million in pulp, $293.7 million in logs, $68.7 million in lumber, $7.9 million in chips, $4.7 million in pulpwood, and $1.8 million in other wood products.

Despite its small population base, Alaska has a sizeable in-state market for dimensional lumber and related products, estimated at $57 to $71 million in 1991. Most of this is served by Pacific Northwest and Canadian suppliers.

Data from the mid-1980's show an estimated 138 million board feet (MMBF) of lumber imported into Alaska and 167 MMBF exported. This suggests there may be an opportunity for another sawmill of similar or smaller scale to that of the Chugach Forest Products (CFP) Seward sawmill. Products would include a full range of kiln-dried dimensional lumber.

In-state and export markets for high-quality chips are likely to remain strong.

With an established Alaska export base of $70 to $80 million of rough sawn lumber, it should be possible to develop additional export business.

Given transportation costs, the CFP Seward sawmill may not be in a position to use much of the available East Cook Inlet Kenai Peninsula timber. Depending on what uses are found for the timber, it may be feasible to establish an integrated mill complex of comparable capacity elsewhere on the Kenai Peninsula. The complex could feature centralized sorting and grading, kiln operations, a treatment plant, possibly secondary mills, and sites for small-scale manufacturers of finished products for commercial and consumer markets. Such a complex could include a forest product technology and business development center.

If 70% or 80% of the wood which is harvested is processed into chips or pulp, then there may not be a sufficient volume of timber to support such a sawmill and manufacturing center.

To build a "critical mass," it may be necessary for producers in the Railbelt area to form a cooperative marketing and technical assistance organization. Such a cooperative could be set up in a format similar to that used with tourism marketing councils in Alaska. Seed money from the State of Alaska and private industry could be used for start-up funding. The organization could handle marketing, technical assistance, quality control, and act as a funding agency.

Taking a cue from Canada, the development of Alaska quality standards, a grading system, and a cooperative marketing program will be essential to the future success of a local wood products industry.

House logs and log homes represent an excellent opportunity for local producers given their acceptance by Alaskan, U.S., and overseas customers. Wood products such as railroad ties, timber bridge materials for public works, docks, and local lumber represent an important opportunity for one or two major suppliers and several small-scale remanufacturers.

The market for new construction in Alaska will remain limited. However, based upon acceptance by housing agencies, there is the potential for one or

two manufactured housing companies. Using in-state sales for their base, it may be possible for these firms to find markets for panelized or other types of construction systems outside of Alaska.

There appears to be potential for wood fuels for energy development. There are many processes which have been developed which may make otherwise unusable spruce feasible for energy applications.

The following opportunities may exist for Southcentral timber industry development. They can be categorized into three levels of complexity:

Least complex:
- Visually-graded white spruce lumber
- Preservative-treated timbers
- Roof and/or trusses of graded white spruce

Moderately complex:
- I-joists utilizing graded white spruce with 2"x2" or 2"x3" flanges
- Glue-laminated timbers
- Finger-jointed lumber

Most complex:
- Plywood
- Oriented strandboard (OSB)
- Laminated veneer lumber (LVL)
- Sandwich or stressed skin panels

The following table summarizes likely markets by product and species for four species of trees found on the Kenai Peninsula. These products are expanded upon in this report.

	Alaska	Lower-48	Int'l.	Paper Birch	Quaking Aspen	Black Spruce	White Spruce
Raw material products							
Stumpage	x	x	x	x	x	x	x
Logs	x	x	x	x	x	x	x
Primary Processing							
House logs	x	x	x			x	x
Rough green lumber	x	x		x	x	x	x
Kiln dried lumber	x	x	x	x	x	x	x
Beams and timbers	x	x					x
Wood chips							
Landscaping	x	x		x	x	x	x
Feed stock	x	x		x	x	x	x
Pulp and paper		x	x	x	x	x	x
Composite panels							
Mat board		x	x	x	x	x	x
MDF		x	x	x	x	x	x
Secondary processing							
Treated lumber							
RR ties	x					x	x
Mine props	x					x	x
Bridge stock	x						x
Surfaced lumber							
Paneling	x	x	x	x	x	x	x
Furniture blanks	x	x	x	x	x		
Decking	x					x	x
Trusses							x
Crating & packaging							
Roe boxes	x	x	x		x		x
Pallets	x					x	x
Shipping crates	x						x
Log structures							
Recreational	x	x	x			x	x
Commercial	x	x	x				x
Residential	x	x	x				x
RTA products							
Furniture	x	x	x	x	x		x
DIY packaged product	x	x	x	x	x		x
Handicrafts							
Turned	x	x	x	x			x
Milled	x	x	x	x	x	x	x
Energy							
Firewood	x			x	x	x	x
Chips	x			x	x	x	x
Pellets	x					x	x
Presto logs	x					x	x
Cogeneration	x			x	x	x	x

1.4 In-Depth Research Needed

From our extensive review of research reports and discussions with various experts, it is clear that there has never been a detailed analysis of wood production and consumption in Alaska. The 1986 report by Gunnar Knapp and Karen Foster provided useful estimates, but lacked the detail necessary to facilitate a wood products industry strategic plan. Such research is needed and should include private and all levels of governmental procurement.

A survey of available technologies for fuels, fiber processing automation, and other applications is also needed.

Funded by the Alaska Science and Technology Foundation, Ed Packee and Kevin Curtis at the University of Alaska Fairbanks have begun studies aimed at improving utilization of Alaska species. These studies include evaluation of the physical properties of spruce and other species and research into appropriate preservative treatment processes for spruce.

1.5 Wood Products Industry

Throughout Alaska there are approximately 200 wood products suppliers, most of whom are in retail and wholesale trade. Among those manufacturing products, the majority are one or two person owner-operator shops making handicraft and custom-built goods.

In 1987, there were estimated to be 200 sawmills in the In[illegible] and Southcentral regions producing 5-6 million board feet (MMBF) per year, about 3% of their average reported capacity (200 MMBF). A 1989 Alaska Department of Commerce directory of all commercial sawmills in the state estimated total capacity to be 525 MMBF. The average capacity utilization, for those which reported production data, was 50%.

The estimated average employment for the timber and wood products industry in 1991 for Alaska was 2,400 persons, plus another 900 in pulp and allied manufacturing.

The only full-time sawmill plant in Anchorage has opened a second mill in the Matanuska-Susitna Borough across Cook Inlet from Anchorage to handle logs and rough sawn lumber for export.

There are nearly three dozen wood products suppliers on the Kenai Peninsula. Roughly a third manufacture wood products, typically rough sawn lumber, handicrafts, and house logs. The balance are primarily wholesalers or retailers.

The largest mill in Southcentral Alaska is the Chugach Forest Products' (CFP) Seward sawmill. This 100 MMBF (two shift) capacity sawmill is currently closed but is expected to resume operation late in 1992, making it the largest Kenai Peninsula consumer.

In addition to the CFP Seward sawmill, a chipping operation to export material from the Kenai Peninsula has recently received financing. However, other than the CFP Seward sawmill, there are no established and operating

companies on the Kenai Peninsula with the design, production, and marketing capacity from which to grow quickly. Thus, without an adequate commercial base, external assistance will be needed to assist local companies in moving up the learning curve and establish a stable sales base. This assistance should include opportunities for financing and development of networking cooperatives.

1.6 Developing an Alaska-based Wood Products Industry

Whatever wood products industry development strategies are employed, much attention should be paid to fostering a locally-owned and operated sector.

One strategy to help define the potential for an integrated wood products industry would be for the EDD, Alaska Department of Commerce and Economic Development, U.S. Economic Development Administration, and other interested agencies to sponsor a Railbelt-wide wood products opportunities workshop which would bring together wood product producers, industry experts, and government and private procurement managers.

The second part of this event would be to hold confidential, private meetings between experts and local entrepreneurs. The purpose of these private sessions would be to provide an initial opportunity for feasibility assessment and to explore specific requirements for development. Information developed through these confidential sessions would be assembled by a private consultant for presentation in a strategic planning document.

Other goals of the workshop could include:

a. Determine the feasibility of a wood products cooperative. Such a cooperative would address buying, marketing, and technical assistance needs for all participating businesses. The cooperative could be organized as a non-profit economic development corporation which could receive public and private funds for the purpose of making grants and loans to members. It may be possible for the cooperative to work toward self-support with public monies used for its seed funding.

b Under strict confidentiality agreements, the EDD would coordinate the next stage of planning and technical/financial assistance for those parties who desire it.

c. Define a state-wide wood product quality assurance and Alaska brand identification program.

A healthy in-state industry requires adequate financing to move from concepts or cottage industry production to the next level of commercial production. Capital for modern equipment and operating expenses is of great importance since small producers lack the cash flow to support necessary marketing and related activities. Local commercial banks generally consider the wood products a high risk business. Also, most small producers will need ongoing help with technical, financial, and marketing assistance. It may be possible to address these needs through a producers' cooperative.

The most likely source for such assistance would be the State of Alaska and outside investors. Prospects for attracting investment have been improved by high stumpage rates in the Pacific Northwest and Canada and dwindling supplies of uncommitted old growth timber resources. Nevertheless, it may be important that the State provide additional support in connection to stumpage prices, reforestation costs, and road construction.

The essence of marketing is the ability of an organization to understand and exploit the relationships between consumers and various industry segments in a strategic framework. Developing an integrated timber industry on the Kenai will require a farsighted marketing approach to be truly successful.

1.7 Wood Products Industrial Park

The concept of co-locating facilities in an industrial park improves margins considerably. This approach is being taken at the CFP Seward sawmill location. A timber manufacturing complex will reduce handling, inventory, and shrinkage costs as well as facilitate communication. The timber complex also insures that each log goes to its highest and best use. Other advantages of the industrial park concept include cooperative marketing and sharing of technical resources.

Such an industrial park would feature a cogeneration facility, central sorting and grading operation, primary mill, and kiln. Small-scale mills and remanufacturers could co-locate with one large primary mill or other processing operation, such as a pulp mill.

It could be advantageous for any mill complex to implement a cogeneration system for kilns and other heating requirements and to produce electricity from its own waste wood. From industry reports, this can increase profit margins by 10% or more, depending on local energy costs. Alternatively, a wood fuel manufacturer may find it attractive to co-locate with a primary mill or industrial park. Possibly, significant quantities of low grade spruce will need to be sold as woodchips to achieve a high utilization of the resource.

1.8 Existing Alaska Business Incentives and Assistance

Freight costs play a critical role in the price competitiveness of Alaska's forest products. The transportation cost of bringing lumber into the Railbelt market from Seattle is about $70 per thousand board feet (MBF). This gives Alaska processors a cushion in local markets but puts them at a disadvantage in West coast markets. Alaska sits about three days closer to Asia than the Pacific Northwest, resulting in a transportation advantage of approximately $7,000 per day for chartered vessels from the Port of Anchorage.

To encourage the formation and expansion of manufacturing in Alaska, the Anchorage Economic Development Corporation established an agreement with Sea-Land for special "backhaul" rates to Alaska producers shipping new products. This incentive could be beneficial to the timber industry. These

rates are 20% to 25% less than Sea-Land standard rate and apply only for goods shipped from Anchorage to Tacoma or Dutch Harbor.

Throughout Alaska, there are regional development organizations, such as the EDD and the Anchorage Economic Development Corporation. There are also a number of other organizations able to provide technical assistance, including the University of Alaska Anchorage/Alaska Center for International Business (ACIB), Community Enterprise Development Corporation (CEDC), University of Alaska Fairbanks Cooperative Extension Service, USDA Soil Conservation Service (SCS), University of Alaska Anchorage/Small Business Development Center (SBDC), and USFS Office of State and Private Forestry in Anchorage. Financial assistance is available from State agencies such as the Alaska Industrial Development and Export Authority (AIDEA).

The Alaska Department of Commerce and Economic Development (DCED) has established a product preference program in connection with state procurement:

Alaska Forest Product Preference Program - 3% to 7% price preference
Alaska bidder's preference - 5% preference
Recycled Alaska Product Preference Program - 5% preference

According to one Anchorage producer of high-quality, competitively-priced office furniture, he finds it difficult to overcome established relationships outside suppliers have with State agencies. Given the extent of State government purchases of wood products, it is suggested that the State of Alaska establish additional incentives and directives for public agency procurement personnel. These could include substitution of wood for steel products and thorough consideration of local suppliers of specialty products over national catalog sales.

1.9 Kenai Peninsula Timber Resources

In 1987, the total timber resource on the Kenai Peninsula was estimated to be approximately 3.67 billion board feet. The total area of the Kenai Peninsula inventory unit was estimated at 5,215 thousand acres. Forest land made up about 1,909 thousand acres, nonforest 3,094 thousand acres, and water the remaining 212 thousand acres. Of the forested acres, 487 thousand were classified as timberland.

An additional 163,800 acres of commercial timberland lie on the West side of Cook Inlet and are on lands which are part of the Kenai Peninsula Borough.

Timberland is defined as forest land producing or capable of producing crops of industrial wood. Areas qualifying as timberland can produce more than 20 cubic feet per acre per year of industrial wood at culmination of mean annual increment. (Mean annual increment is a measure of the volume of wood, in cubic feet, produced on 1 acre during 1 year.) The following table illustrates the potential timber volume and distribution of selected species.

Kenai Peninsula - Net Volume of Timber, 1987
(thousands of board feet)

	White Spruce	Sitka Spruce	Mtn. Hemlock	Quaking Aspen	Paper Birch	Total*
Private Lands:						
Pole Timber	5,183	0	352	1,544	16,678	23,757
% of tot spec	1.0%	.0%	1.6%	100.0%	29.6%	2.0%
Saw Timber	4396,530	609,177	21,019	0	39,758	1,169,624
% of tot spec	98.8%	100.0%	98.4%	.0%	70.4%	97.7%
Total	502,754	609,177	21,371	1,544	56,436	1,197,622
% of total	42.0%	50.9%	1.8%	.1%	4.7%	100.0%
Total All Ownership						
Pole Timber	49,784	0	5,755	19,594	146,223	221,357
% of tot spec	3.1%	.0%	1.7%	100.0%	38.6%	6.0%
Saw Timber	1,534,028	1,266,866	339,720	0	232,112	3,424,032
% of tot spec	96.0%	100.0%	98.3%	.0%	61.4%	93.3%
Total All	1,598,400	1,266,866	345,475	19,594	378,335	3,671,308
% of total	43.5%	34.5%	9.4%	.5%	10.3%	100.0%

*Includes Miscellaneous species
(Note: Row totals may not sum since other species, such as Black Cottonwood and Black Spruce, are not shown. Column totals do not sum to totals since seedlings/saplings and other growth are not included in this table.)
Source: W. van Hees and F. Larson; 1987; percentages calculated from their data.

Excluding peak harvests of nearly 70 MMBF in 1989, and 13 MMBF in 1987, the annual harvest volume from the Chugach National Forest averaged nearly 1 MMBF throughout the 1980's. It should be noted that the Chugach National Forest extends well beyond the political boundaries of the Kenai Peninsula Borough.

Chugach National Forest Timber Harvest
(thousands of board feet)

1980	1,565	1986	563
1981	1,814	1987	13,031
1982	679	1988	1,185
1983	751	1989	69,516
1984	545	1990	1,000
1985	354		

Source: USFS Pacific Northwest Research Station, 1992.

Individual timber sales have been infrequent for a number of reasons including a lack of processing facilities and the inability of the local market for green lumber to accommodate large volumes.