

Solutions for the City of Arcata
Regarding
Non-Native Invasive Plants

For ENVS 310

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Introduction

Our problem solving group was assigned the problem of non-native, invasive plant species in the Arcata vicinity. We worked with the City of Arcata to develop a strategy for education about and eradication of non-native invasive plants.

The homogenization of Earth's flora and fauna and the subsequent loss of biological diversity is a problem of global significance threatening not only ecological, but economic change as well.

Biological pollution -the introduction of non-native plants, animals and other organisms- is rivaled only by development. The most aggressive exotic plants are unacceptable because they can exclude native plants, degrade, alter or displace natural plant communities, reduce biological diversity, disrupt ecosystem processes, alter fire frequencies, restrict economic return, reduce recreational values, and threaten endangered species. Invasive non-native plants have the potential to fundamentally alter the unique biological diversity and natural character in California. Non native invasive plants are of specific concern in Arcata because of the threat posed to the sensitive native ecosystems that we value so highly. Forest, dune, marsh, and riparian communities are specific areas of consideration. Furthermore, privately owned lands within the city are a key area of concern and the most difficult to control.

Our main focus was on the problem of non-native invasive plants in the City of Arcata. Specifically we sought to augment the city's existing policy on non-native invasive species. A key goal of the project was to raise the awareness of Arcata residents about what plants were problems as well as the areas hardest hit by non-native invasives. Raising the awareness of city residents about the effects of non-native plants is not a job that can be completed in one semester. The project our group developed had the best chance to begin to effect change in attitudes of city residents. Moreover, the city's policy on non-native plants was close to non-existent. Our reasoning was that with a more complete city policy focusing on not only the fact that non-native plants are a problem but also on a multifaceted

plan that would combine the efforts of the city and other organizations that were already attacking the problem as well as involving Arcata residents. Making residents part of the plan is integral to making any type of community plan work. With out the involvement of the private sector this project would never be successful.

In the course of doing this group members met with Julie Neander of Arcata Environmental services where we were made aware of the city's position, what the areas of concern were, and ways in which we could raise awareness and coordinate the city with existing organizations already dealing with the problem. Julie advised us that costs incurred by the implementation of any solutions should be kept to a minimum. By listening to Julie we realized that the city not only lacked the funds but also the personnel to adequately address the problem, these facts became an integral part of our problem solving process. Because of this lack of funding and people, the city is essentially unable to monitor any progress that might be made with a program addressing the non-native species issue. Furthermore, if the project was ineffective, more valuable funding might be lost due to a slow reaction in changing an ineffective program. It became clear to us that some form of monitoring must be part of our final proposal.

We also attended Native Plant Society meetings to help facilitate the process of coordinating the city with local organizations dealing with the issue. At these meetings we observed how organizations such as NPS raise awareness about the importance of native plants in the state. We were also able to develop a sense of what would work for us and what wouldn't.

Primarily we developed a list identifying the most persistent non native species affecting Arcata. We developed this list through consultation with the Environmental Services Department as well as the NPS. The plants identified in the list are problem species not only in Arcata but along the entire north coast of California. Furthermore, the list reflects plants that profoundly affect the previously mentioned sensitive ecosystems.

Using a problem solving framework we developed measures to mitigate the problem as we saw it. By working through this process it became difficult to separate the symptoms from the problem. The challenge was to develop a problem statement that reflected the city's dilemma regarding non native invasive plants without the problem statement simply restating the symptoms.

The symptoms that the city is currently experiencing due to invasive non-natives led us to a problem statement. Moderate habitat loss in general, as well as a significant impact on rare and endangered species were the main indicators of the problem. Economic loss is also an issue. Pampas grass routinely overtakes clearcuts making seedling establishment difficult. Moreover, the funding needed for eradication isn't readily available. The city is searching for means to eradicate and control non-native invasive plants at an acceptable cost.

Problem Statement

In following the framework established in the course, our first task was to define our problem statement. Defining the problem statement began with the question that we were given at the outset “Non-native plants can sometimes be invasive. This team will develop an education plan that will help reduce problems caused by non-native species.” With this as our starting point, we then began to formulate our problem statement. One difficulty, which we ran into with defining our problem statement, was in differentiating between a “problem” and a symptom. When looking at our issue it quickly became apparent that the true problem, which lies at the root of non-native invasive plants, is that they are here. The fact that they are here, and have been introduced into our area is not an issue that we could address within the timeframe of this course. Therefore we had to take a step back and reassess the problem into an area that we could actually address. The problem statement that we developed is “The City of Arcata is seeing an increasing abundance of non-native invasive plant species. These invasive plants take over habitat for native plant and lead to a lack of biological diversity in Arcata’s plant communities.”

Goals

From this point of defining our problem statement, we then developed a number of goals that we wanted our solution to incorporate. The first was to reduce the demand for non-native invasive plants. This was seen as an especially important goal in that by decreasing demand we would reduce the further introduction of additional numbers of known invasive plants and additional invasive species. The second goal that we developed was to educate the Arcata community about the nature of these plants and non-invasive alternatives to them. By educating the community about the issue we hoped to

promote a proactive approach to dealing with these plants. The third goal was to coordinate involvement between the different organizations that are currently dealing with invasive non-natives. There are already a number of groups independently addressing the issue of invasive plants and we wanted to prevent unnecessary duplication of these measures so that the most progress possible could be obtained. The fourth goal was to find a method of compensation to encourage work within the community regarding these invasive plants. Simply providing individuals with information regarding issues and actions that should be taken is not generally sufficient to actually achieve any action. By providing an incentive of some sort, we felt that action had a higher probability of occurring. The fifth goal that we developed was to minimize the eradication of these species by toxic means. Undoubtedly the easiest way to eradicate any unwanted organism is to use toxic materials, our group, however, understands the repercussions of such methods and wanted such to be as minimal as possible. It does not seem logical to eliminate one problem by exacerbating another. Our sixth goal was to develop solutions that we as a group could implement within the timeframe of this course. The time and effort which has been expended to develop our solutions we did not want to be wasted, since we attempted to develop real world solutions we did not see any reason why they should not actually be implemented.

Objectives

Once these goals had been established, we defined a number of objectives by which our alternative solutions could be evaluated. Our first objective was to “expose 50% of Arcata residents to useful information regarding invasive non-native plant species”. This objective gave us a quantifiable standard by which to judge not only our

alternative solutions but also the effectiveness of those solutions once implemented as well. The second objective, which was adapted as further work progressed, was to “develop a set of guidelines for the Arcata City Council to, ultimately, formulate a city position on invasive non-native plants”. At the outset of this project, we were led to believe that the city did not have such a policy and therefore it would have been appropriate. This objective was adapted to read “develop a set of guidelines for the Arcata City Council to augment section RC-1d regarding non-native invasive plants.” The reasoning for this change will be explained later in this paper. Our third objective was to “coordinate the City of Arcata with other local groups that are directly involved with invasive non-native plants.” These objectives provide a standard by which our solutions can be assessed.

The Group Process:

The Group process for us presented many challenges and benefits to solving the problem of invasive non-native species. In the beginning, time and conflicting class schedules was a problem for us. To solve this problem we managed to work on the problem, during the evening, at least once a week. After a short time, the meetings tended to take place at the same place, day and time. This had advantages. By meeting in the library we had quick access to research material so ideas could be explored on site at the meeting. Having the meetings at one particular day of the week and at the same specified time each week helped maintain focus on the problem.

When we were faced with a decision or problem we used group consensus. This way all members of the group were able to become personally involved with the group so that we could produce viable solutions to problems that faced the group.

As a group we were able to handle the problem of invasive non-native plants but new problems were created when trying to establish connections with the city of Arcata and outside organizations related to the problem. We first met with the city of Arcata soon after the problem statement was formed. From that meeting we concluded that Arcata was asking for a development of guidelines to follow when dealing with the problem of invasive non-native species. This focused our group onto an objective that would include a 'draft plan' that could be incorporated into Arcata's 20/20 plan. To meet this objective we felt that involving outside organizations such as the Native Plant Society would be helpful in reaching a lasting plan. We then went to a NPS meeting to find out what they felt should be involved in a 'draft plan'. Within our group, we assumed that a good draft plan would take time to develop and refine, this left a time gap between meeting with

Arcata and the NPS. The time gap became a problem when we later met with NPS. At the meeting we learned that NPS rewrote the 20/20 plan statement on invasive non-native plants (RC-1b). This may have happened due to the city of Arcata lacking confidence in our group's ability to create a working product. To alleviate this problem we could have remained in better communication with the city of Arcata. This would have been difficult due to the problem solving steps we were taking to reach good solutions and the lack of time the city had to meet with us. This did not prevent us from meeting our objectives. Once we decided that a 'draft plan' would not be a solution, we were able to meet with the city of Arcata and the NPS together with a set agenda that outlined our problem and possible solutions. This worked very well in redirecting our efforts towards viable solutions.

ALTERNATIVE SOLUTIONS

I. Educating and Informing the Community

A. Illustrated posters and pamphlets that can be distributed to the community

1 *Pros*

- a. visual and written
- b. lots of information
- c. simplicity
- d. feasible to time frame

2 *Cons*

- a. no interaction with the public
- b. may not understand the message
- c. moderate cost depending on the quality

B. Advertising, PSA, Feature News Article

1 *Pros*

- a. good circulation
- b. low cost as a PSA or feature news article

2 *Cons*

- a. little interaction with public
- b. hard to measure results
- c. high cost if buying ad space

C. Library Display at HSU

1 *Pros*

- a. fun to create
- b. reaches a large audience
- c. entertaining

2 *Cons*

- a. limited audience
- b. time constraints on how long it will be displayed
- c. may not be possible for this school year

D. Mass Mailing

1 *Pros*

- a. large audience
- b. feedback if questions are asked
- c. measurable results

2 *Cons*

- a. invasive to public
- b. high cost
- c. low return of mailing

E. Electronic Media (TV, Radio)

1 Pros

- a. large audience
- b. entertaining
- c. does not require ability to read
- d. TV can demonstrate ways to remove invasive non-native plants

2 Cons

- a. high cost for production
- b. time constraints for what can be shown on TV
- c. no visual aids for radio
- d. may not reach the right audience

II. Guidance for the City of Arcata

A. Draft Plan

1 Pros

- a. long-term effects
- b. measurable results
- c. flexible and can be modified for new invasions
- d. coordinates outside groups
- e. uses existing resources
- f. low cost for planning
- g. meets time constraints

2 Cons

- a. may not be used
- b. could conflict with other city departments
- c. no immediate reduction in invasive exotic plant populations

B. Development of an Internship Position for the City of Arcata

1 Pros

- a. dedication to the problem
- b. ability to coordinate between outside organizations
- c. can educate the public
- d. direct action towards the problem

2 Cons

- a. possible cost problems

- b. person may not be dedicated to the problem
- c. time constraints on the intern
- d. the city decides if there is an internship

C. Legislation against Invasive Non-Native Plants

1 Pros

- a. very effective
- b. city has to follow guidelines
- c. long term results

2 Cons

- a. invasive to the city and public
- b. high cost
- c. could spark opposition
- d. not feasible with time constraints

III. Coordination Between Arcata and Outside Organizations

Set up a meeting between Arcata city council, Native Plant Society, and Friends of the Dunes.

1 Pros

- a. Could lead to possible coordination
- b. Results will be measurable

2 Cons

- a. Difficult to arrange
- b. Could lead to disagreement between the organizations and the city
- c. No constructive action could result

Rejected Alternatives

Electronic Media (Television and Radio):

One way to reach the objective of “Exposing 50% of Arcata residents to useful information regarding invasive non-native plant species” is to use electronic media such as television and radio. Limited time on television and radio can be had for free due to the Federal Communications Act of 1934 which guarantees free time for Public Service Announcements (PSA)

Television:

Television is the choice medium of one way communication to a large audience. The advantage of television is in the use of sight and sound to convey the message. This makes it a medium through which we could show an invasive plant species and talk about it at the same time. Another positive for the use of television is that the viewer doesn't need the ability to read, which is the case for other forms of media except for radio. Television also has negatives such as free PSA time is limited to 30 – 60 seconds per message. Another problem is one of the quality of the message and its effectiveness with the public, “ While there is an increasing tendency to give local interest causes more attention, some of it is tokenism and “filler” and is treated as such. Many television stations, because of the nature of the federal regulations that govern them, are concerned with little more than quantity of public service time, NOT its quality (Biegel, 60).” The last issue is one of cost. To create a high level of quality that would present an effective message to the public would create high cost such as the cost of the video crew, editing, mixing and graphics. All of these negatives make television an unattainable solution.

Radio:

Radio is a good format for announcing events and programs but, for our problem of Invasive non-native plants, radio, by nature of speech only format, compounded by the limited PSA time, would make it ineffective in giving out useful information on the problem to Arcata.

Newspaper:

Newspapers are an effective way to educate the community. A recent example of this is Abe Walston's feature news article "An Insidious Ecological Crises", featured in Econews, which focused on the problem of invasive non-native plants. This type of information can be done with little cost, unless it is an advertisement, and can reach most of Arcata's population. The negative side to newspapers is the amount of time in circulation and the amount of time a person takes to read a newspaper. Circulation for the Arcata Eye is one week, The Eureka Times Standard is one day and the amount of time someone may take reading a newspaper can vary. "if people don't read your ad (article) the first time they look at the paper, your unlikely to get another shot at them(White, 99)." For our objective we wanted information that would last longer than the life of the newspaper.

Direct mail:

Direct mail is a medium that has the potential to educate with useful information. With direct mail we would know that X amount of the population of Arcata would receive

information on invasive non-native plants. We could also measure the amount of population that thoroughly read the information. "Direct mail produces easily measured results, since you produce X amount and have X amount respond (White; pg. 99)." By having them respond back to us, direct mail contact could also find the most interested members of the community by simply asking a few questions. The drawback of the use of direct mail is waste. The number who do not respond have to be considered waste and if the response rate is low we added to the problem of solid waste without helping our problem of invasive non-native plants. The final negative is cost. Direct mail is expensive to produce given the cost of paper, printing, postage, and return postage; thus putting its use out of our group's reach.

Illustrated posters

To satisfy our first objective of educating and informing the community concerning exotic invasive plant species, we considered designing posters that could be distributed in the community. Benefits of designing posters would be that posters are informative, fairly simple to create, and are both visual and written, so they appeal to different learning senses and involve different parts of the brain. We consulted with a graphic design artist who agreed to create an eye-catching alien invader cartoon that would attract attention. These posters would be distributed to all the local elementary schools, jr. high schools, and high schools in the area. The posters would also be visible all over Arcata, and they would be posted at every designated bulletin boards at H.S.U.

The Campus Printing Center was contacted regarding printing and paper prices. We learned that printing posters was economically feasible, and that the time necessary for the printing process was compatible with our time frame.

Regardless of the numerous benefits associated with educational posters, we decided not to implement this solution, mainly because it did not involve public interaction. Without public interaction, we would have no means to monitor our results or our process.

Lack of support from interested parties was another issue that contributed to our decision not to use educational posters. We did not want to create the poster until after our coordination meeting with the City of Arcata, the Native Plant Society, and the Friends of the Dunes. At the meeting, the involved parties did not show much

enthusiasm about our idea, but they later described what they felt would be a more effective educational tool--brochures, which will be discussed later.

Library Display Case at H.S.U.

Another proposed solution that would fulfill our educational objective was to design a display for the H.S.U. library. This option would perhaps satisfy our objective because it would reach a sizable audience. Every person who would walk by the display case would be exposed to educational information concerning non-native plant species. A display would be pleasurable for us to create, and entertaining for the audience to see. We considered gathering and displaying samples of Baker's Dirty Dozen; that way students could learn exactly what the unwanted plants look like. We would also provide information on eradication methods, and we would present native alternatives to popular exotics.

Although designing a display seems like a favorable solution, it would not have been possible to implement it this semester. After consulting with the Library Administration Office, we were informed that proposals to use the display cases for this semester were due in August of 1998. If somehow we did have access to the display case, our exhibit would only be up for two weeks. Ideally, we would need more time if we were to truly educate a large portion of the student population. Also, using the display case for educational purposes was not the best solution because it would mostly only expose H.S.U students and faculty; our objective was to educate local residents—not just students.

Draft Plan

To satisfy our objective of creating guidance for the City of Arcata concerning invasive exotic plant species, we considered writing a draft plan. The draft plan would state the City's position on the issue, and it would articulate the City's plan to manage invasive exotics now, and in the future. The benefits of writing a draft plan would be that it would produce long-term effects and measurable results would be flexible and could be modified for new invasions. A draft plan could coordinate outside groups, would use existing resources, and would be inexpensive. We were also in favor of writing a draft plan because it would have been a solution that could have met our time constraints.

The cons of articulating a draft plan were that the plan may not be wanted, used or even read; it might have just sat on some busy person's desk with a pile of other papers that are waiting to someday be read. Furthermore, a draft plan that discusses the City's position and future plans would not show an immediate reduction in invasive exotic plant populations.

Legislation Against Invasive Non-Native Plants

Another alternative solution was to write legislation that outlaws use of invasive non- native plants, and encourages use of native alternatives. Such laws might be very effective since the City and local residents would be required by law to follow the guidelines. The fact that the results would be long-term is another benefit of legislation.

Although lobbying would perhaps be one of the most affective solutions, it is not at all realistic considering the amount of time and resources allotted to us. Opposition to the legislation from the City and its residents would also be a problem.

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Final Solutions

After researching our alternatives and discussing them with the Environmental Services coordinator of Arcata Julie Neander we decided on three solutions for implementation. These are:

- 1) A meeting gathering local organizations together
- 2) An internship position through the city of Arcata
- 3) A pamphlet to provide public information to the city of Arcata

The meeting:

During our first meeting with Julie Neander she recommended that we arrange a meeting between several local groups that deal with non-native, invasive plant species. These organizations are the North Coast chapter of the California Native Plant Society (CNPS), the Friends of the Dunes (FOD), the City of Arcata, and the Humboldt Botanical Garden organization. Effective meeting techniques were researched and implemented.

It is important to have a meeting facilitator or leader. It is also effective to have an agenda created and distributed prior to the meeting time so ample time is given to participants to prepare for the meeting (Pace). This agenda should include goals and objectives. Participants should know what information they are expected to provide at the meeting. Structure of the meeting should include a timekeeper who keeps people on track. Also, information should be summarized periodically to formulate logical conclusions from ideas generated. The facilitator should be able to keep the group focused and mediate when needed. The facilitator should summarize information at the conclusion. Follow-up to a meeting is a key component to assure participants that accomplishments were made (Triangle).

For our meeting we invited representatives from the CNPS, FOD, and the City of Arcata. We created an agenda that was distributed 4 days in advance. This agenda is included as appendix A. We scheduled the meeting to be one hour in duration. Because of time constraints a representative from the Friends of the Dunes was not able to attend. We were able to bring Julie Neander from the City of Arcata and Gordon Leppig, president of the local NPS, to the meeting.

During the meeting we discussed the best strategy for implementing solutions to the invasive plant problem. We decided on the pamphlets for citizens and the creation of an internship through the city. We identified the important species to be included in the pamphlet and discussed the roles of the intern.

The pamphlets:

The city includes a statement in their 2020 plan that they will provide information to citizens regarding invasive species. A pamphlet that can be obtained at City Hall was decided on as the most direct way to supply information. The pamphlets can also be mailed upon request. To create an effective pamphlet we did research and found a model as well as the important parts of pamphlets.

Pamphlets are an inexpensive option to disperse information. There are many elements to pamphlets that make them effective learning tools. Two of these are an attention-grabbing cover and sequential and unified inside panels. The cover should be simple yet dramatic with ample blank space to not crowd the theme. The center of interest should be very obvious. The panels inside the pamphlet should contain sequential graphics, color repetition, and bold headlines.

The pamphlets we are designing meet these criteria. There will be twelve local invasive plants focused on. These specific plants were chosen by the NPS and FOD. The pamphlet will be a guide to plant identification, alternatives, and eradication methods. A work in progress of the pamphlets is included as appendix B. The City of Arcata will have these pamphlets available as early as June 1st.

The internship:

Our group has created an invasive plant problem-solving internship that will be available through the city starting in the Fall of 1999. The roles of the internship are described in appendix C. In general, internships provide hands on, real world experience that can be paid positions or offer credit at an educational institution.

Works Cited

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Zehr, Jeffrey et al. 1991. Creating Environmental Publications. UW-SP Foundation Press Incorporated, Stevens Point, WI.

Appendix A

From: Environmental Science, Invasive plant group
To: NPS, FOD, City of Arcata

Invasive Plant Agenda

Problem: The City of Arcata is seeing an increasing abundance of non-native, invasive plant Species. These invasive plants take over habitat for native plants, leading to a lack of Biological diversity in Arcata's plant communities.

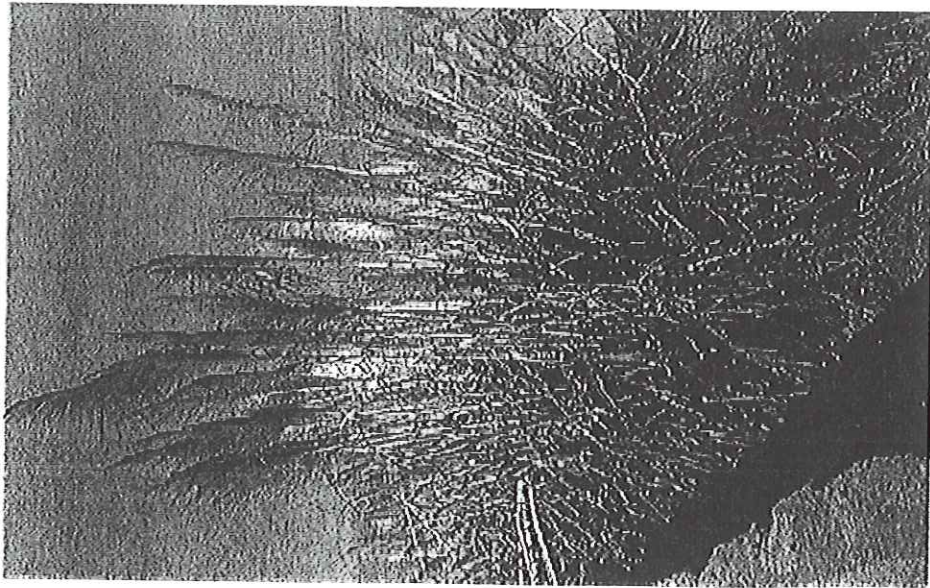
- Objectives:**
1. Expose 50% of Arcata residents to useful information regarding invasive non-Native plant Species.
 2. Develop a set of guidelines for the Arcata City Council to, ultimately, augment Section RC-1b regarding non-native invasive plants.
 3. Coordinate the City of Arcata with other local groups that are directly involved With Invasive non-native plants.

Possible solutions that need to be discussed:

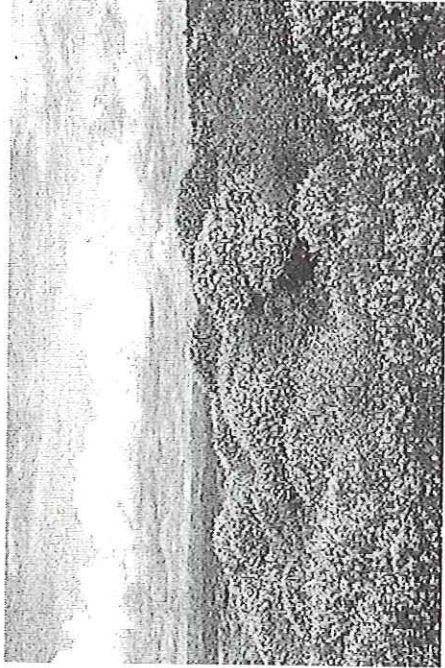
- I. An Internship for the City of Arcata.
 1. How would an internship be helpful to your goals?
 2. What would you see as their role in invasive non-native plant management?
- II. Draft guidelines for the City of Arcata.
 - A. Components of a plan augmenting Section RC-1b
 1. Define problem areas and plants.
 - a. areas of concern
 - b. plants of concern
 2. Methods of eradication
 3. Prevention
 - a. legislation
 - b. education
- III. Coordination
 - A. Coordinate a meeting between NPS, FOD, C of A, Humboldt Botanical Garden.

Invasive Plant Species of the City of Arcata

Invasive plants are a threat to plant biodiversity on the Northcoast and around the world. They can physically displace native plants from their habitat. This can also impact the animals that survive off of these native plants. Invasive plants can alter the chemical balance of ecosystems, decrease soil fertility, and change fire frequency.



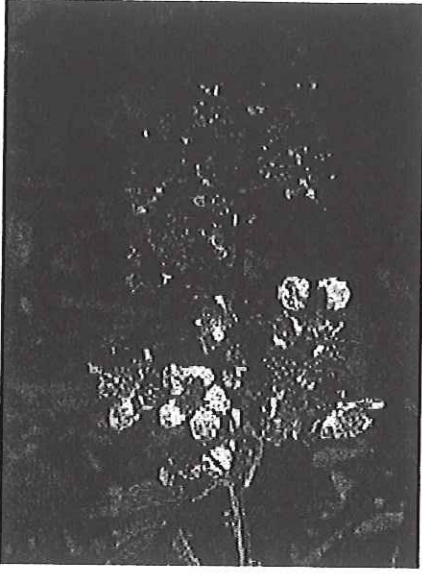
A citizen's guide to the most invasive, non-native plant species in Arcata and the surrounding area.



Yellow Lupine overtaking a beach near Arcata.

This pamphlet serves as an informational guide to the most invasive plants in Arcata and the surrounding community. It will help you identify the plants and learn how to eradicate them.

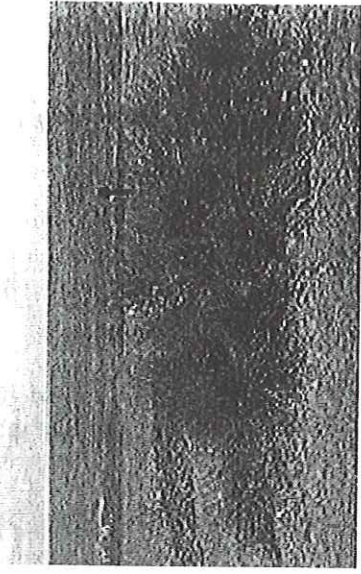
The plants found in this guide are discouraged from being intentionally planted for landscaping or erosion control



Source: Redwood National Park
Himalayan Blackberry (*Rubus Discolor*)

• **Location:** This plant can be found all over the city. It is particularly invasive of the Arcata Marsh. This plant also invades roadsides, coastal grasslands and streams.

• **Eradication:** The canes are dug out to near the ground and the basal burl should be dug out using a shovel or backhoe. Each site is checked monthly for resprouts for at least six months. Sites should then be monitored every two months for about a year. A final check should be made during the spring after eradication to pull up any seedlings that might have arrived.



Source: Redwood National Park
European Beach Grass (*Ammophila arenaria*)

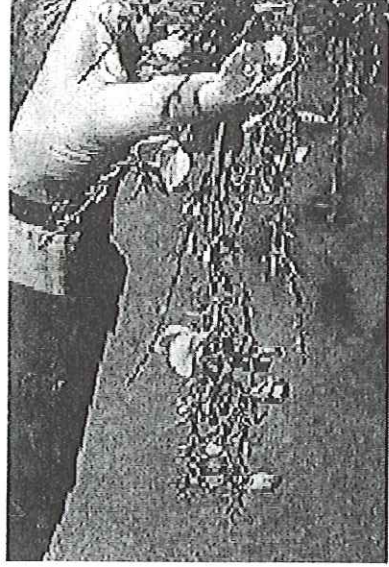
• **Location:** This invasive grass is found on the beach dunes. It can be seen on Mad River Beach and elsewhere along the coast.

• **Eradication:** Above ground shoots should be carefully removed with a shovel. The site should be monitored monthly for one year to remove sprouts. Sites are then monitored every three months for up to three years.



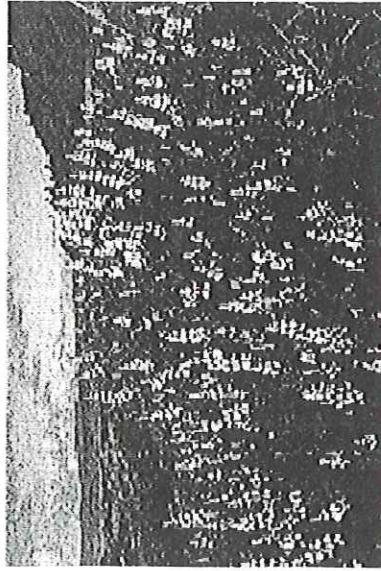
Source: Redwood National Park
Iceplant: (*Carbrotus Edulis*)

- Location:** This plant is found in the dunes at Mad River beach and other local beaches. It sends shoots through the sand that quickly expand its territory.
- Eradication:** This plant should be pulled up slowly, following the roots with a shovel if necessary. Plants should then be burned to guarantee they won't reroot themselves.



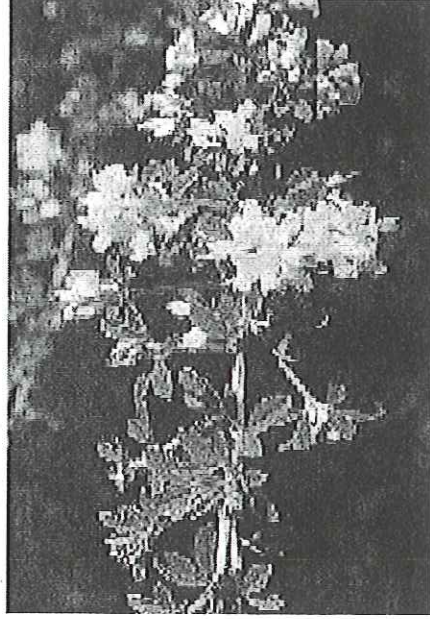
Source: Redwood National Park
Scotch Broom (*Cytisus scoparius*)

- Location:** Scotch Broom invades coastal and foothill habitats. In Arcata it can be seen all over. It is often on the edges of forests and along roadsides.
- Eradication:** When removing broom, pull up the entire plant. Broken stems can re-sprout and will grow another plant. Prairies are sometimes burned to kill small seedlings.



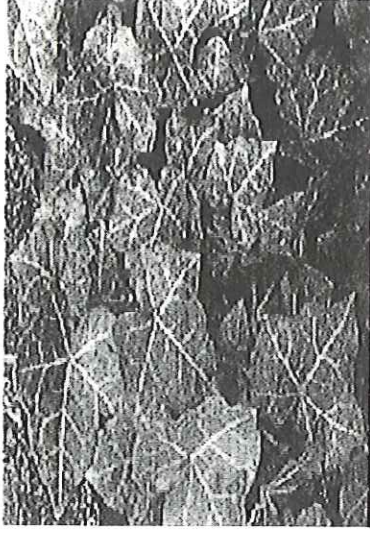
Source: Redwood National Park
Yellow Lupine (*Lupinus arboreus*)

- Location:** This invasive lupine is also found in the sand dunes. It forces native plants out of their habitat.
- Eradication:** Hand pulling and weed wrenching are the best methods of removal. The entire root system must be removed for the plant to die. Plants can be left where pulled, but large quantities are removed and burned to preserve the aesthetic quality of the beach.



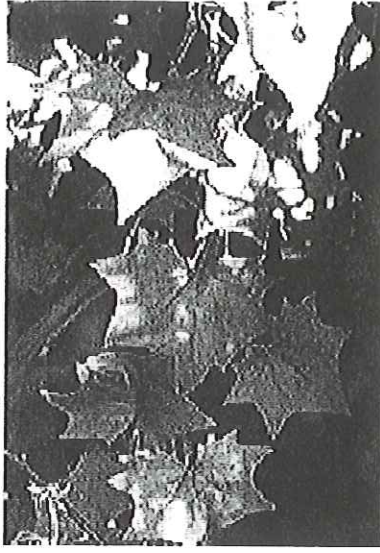
French Broom (*Genista monspessulana*)

- Location:** This broom is located in recently disturbed areas and can also be seen near dunes.
- Eradication:** The method of eradication is similar to that of Scotch Broom. An alternative to tearing it out (because this can sometimes cause soil disturbance) is to shade it out over time. Planting tall shrubs and trees can provide the shade necessary.



English Ivy (*Hedera Helix*)

- Location:** English Ivy can be found all over Arcata. It is most invasive in the community forest. It will climb trees and undermine their ability to survive. It spreads very rapidly.
- Eradication:** The entire plant, including the roots can be manually removed. Care must be taken not to drop any of the fragments because they will resprout. Resprouts should be removed and burned on a monthly basis.



Source: Redwood National Park

Cape Ivy (*Delairia odorata*)

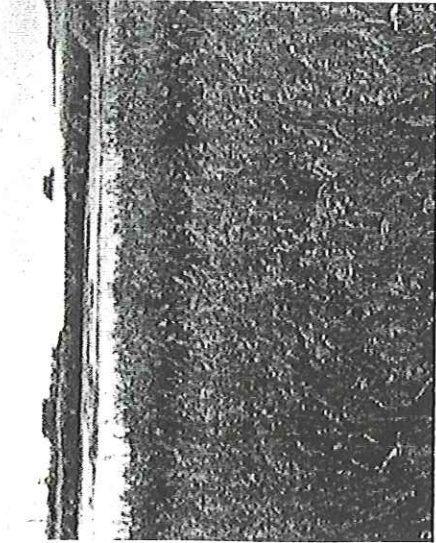
- Location:** This ivy is also found in the community forest. It is found in other riparian communities and on private property around Arcata.
- Eradication:** Eradication methods are essentially the same as the English Ivy. Cape Ivy will not climb up trees, but is just as threatening to soil conditions as English Ivy.



Source: Utah Poison Control Center

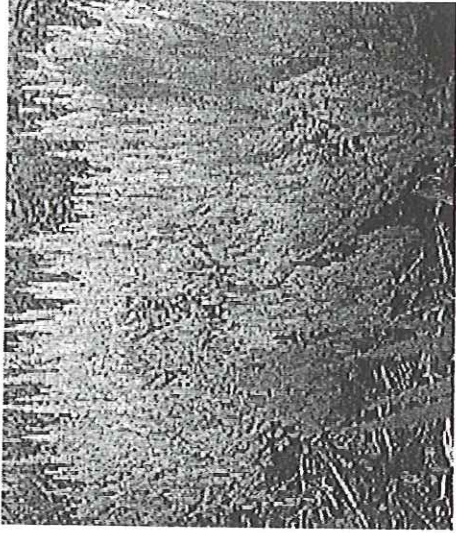
Cotoneaster (*Cotoneaster Franchetii*)

- **Location:** This shrub is found in the community forest and other Redwood and Spruce Forests. It quickly outcompetes native berries and takes over their habitat.
- **Warning!** Cotoneaster is Poisonous! Do not eat berries.
- **Eradication:** Cotoneaster should be cut down to its roots and then dug out with a shovel or backhoe.



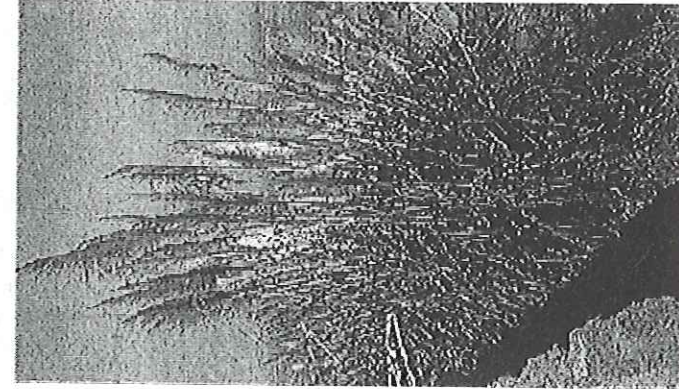
Common Reed (*Phragmites australis*)

- **Location:** Found along marshes and slow-moving streams.
- **Eradication:** Cutting has been found to be effective but must occur at appropriate times; just before the end of July is best. This may eliminate a colony if carried out annually for several years. Care must be taken to remove cut shoots to prevent their sprouting and forming stolons.



Spanish Heath (*Erica lusitanica*)

- **Location:** Spanish Heath is located in disturbed areas and coastal grasslands. It is often found in ecotones, the borders of plant communities.
- **Eradication:** Plants may be hand pulled or grubbed, the best time for this is when soil is moist. It may be slashed in early winter to prevent flowering and subsequent seedset. Burning plants to avoid resprout is recommended.



Pampas Grass (*Cortaderia Jubata*)

- **Location:** This tall-growing invader is found on the beaches, in the forests, and at the marsh.
- **Eradication:** Rapid growth of native trees can shade out Pampas Grass. Digging out plants while they're small is best. Plumes can be cut and bagged to prevent seed dispersal. If plumes are left on bare ground, seeds will sprout.

This pamphlet was designed by Daniel Poter, Michelle Smith, Shiloe Braxton, Andrew Locicero, and Elizabeth Pohlman. Information was taken from the Department of Fish and Wildlife and the National Park Service.
May 1999

Internship

An internship is available to help the City of Arcata eradicate invasive plants.

The position:

- 80 hrs over one semester
- Credit through Humboldt State University

Work involved:

- Educational Outreach
- Develop web site links to other organizations from the City's current page
- Survey of landowners
- Organizing eradication days
- Research Native Stewardship Project
- Grant writing for funding of eradication