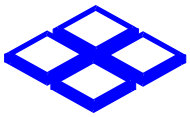

REGIONAL AND ECONOMIC SCIENCES

Applied Policy Studies for the Public and Private Sectors

REPORT ON A MAIL OUT SAMPLE FOR BUTTE ENVIRONMENTAL COUNCIL

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Introduction

This is a descriptive report on a mail out sample taken by the Butte Environmental Council for the Chico USA Education and Outreach Program to estimate the impact of efforts by them to influence public awareness and behavior surrounding issues of runoff pollution from the urban area of Chico. The survey was mailed out to 850 addresses (mostly Chico addresses, and some Forest Ranch and Cohasset). The sample was purchased from Survey Sampling International, and the addresses were matched to the phone number sample that was used for the 2005 initial pre-project telephone survey. A total of 850 matches were made.

As is typical, the response rate for a mail survey is low, and averages at a 10% response rate. Of the 850 surveys mailed, we received only 85 responses.

The three questions posed in the mailer survey will be incorporated into the final follow up telephone survey, to be conducted spring of 2007. This will provide another opportunity to pose these questions to the public to evaluate public knowledge of runoff pollution issues and solutions, and to evaluate the effectiveness of the Chico USA Education and Outreach Program.

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THE QUESTIONNAIRE

The questionnaire had three main questions, with opportunities for multiple answers (for a total of 20 questions) asking the respondent to “check all that apply”. A copy of the questionnaire is located in Appendix A of this report. All responses are “yes” or “no”. The first set of questions, beginning with Q1a through Q1k, consists of sources for the respondent’s information about receiving educational messages regarding polluted water runoff. The questions Q1a through Q1k contain choices for Television through Other as sources for information and education regarding the form of one’s receiving information. The second question asks:

> **Were you aware of the fact that water runoff from your yard, driveway and gutter drains directly into our creeks and streams before hearing or reading this message? The response categories are “yes” and “no”**

This question is used as a primary mode of analysis for this data. It has been converted into a variable called “aware”. This question was recoded to 0 and 1 as are all the other questions. A zero means the person had not heard, did not engage in the activity or was not aware of the issue of spillage into the creeks and streams. A one means the person had heard, had engaged or had been aware of the runoff issue.

Question 3 asks the respondent if they had changed their behavior to “protect” the local creeks and streams from polluted water runoff. The topics included 10 behaviors such as locations where you wash your car, recycle auto oil, littering and the use of reusable shopping bags. All of the choices in the multiple response questions are located in Appendix A.

We use a significance level of $p <= .10$ to make a decision about whether there is a relationship in the measures regarding awareness of the runoff issue and either sources of information or changes in behavior as a result of the media blitz. There is one relationship found in the sources of information section of the questionnaire and there are three in the changed behavior section. However, they all do not show positive relationships in terms of the impact of the media blitz. Two types of statistical tests are used and the remainder of the data processing consists of frequency counts of responses to the multiple choices in the two sets of questions. All data is rounded using the standard rounding rules of the first decimal in which if it is 5 or more, the value is increased to the next digit. If not it is left what it is. Hence a number such as 42.58 % is rounded to 42.6%.

ANALYSIS OF MEDIA CONSUMPTION

Table 1 shows the frequencies from most frequent to least frequent of the responses to question 1 which asks about the source of educational messages regarding sources of pollution. Television became the most frequent source of information on these matters according to the survey respondents. The least source of information is the Chico USA Booth.

TABLE 1
FREQUENCIES OF SOURCES OF INFORMATION
POLLUTED WATER RUNOFF TO CREEKS AND STREAMS

SOURCES OF EDUCATIONAL NEWS ABOUT POLLUTED WATER	Number yes; heard or saw	Number no; did not hear or see
Television	34	53
Radio	22	65
California Water Bill	21	66
Daily Newspaper	16	71
"Other"	15	72
Downtown Chico Murals	11	76
Weekly Newspaper	8	79
Posters	6	81
Chico USA Brochure	5	82
Internet	1	86
Chico USA Booth	0	87

None of the comparison tests of source of news about runoff and topics about runoff showed significant differences except those who read the weekly news papers. All of those who responded that they read the local weekly indicated they had knowledge of pollution going to streams and creeks before the media blitz. Table 2 illustrates that result with a cross tabulated table. The reader might wish to examine the frequencies and percentages in this table. While the relationship is equal to or less than a likelihood of $p = .10$ and it is an indication that the blitz did not have an affect among these respondents. There seems to be a difference in knowledge of this policy matter and types of educational sources for knowledge of this matter. One hundred percent of those who read the weekly newspaper indicated they knew of the issue of runoff while almost 71% of those who did not find their knowledge of this matter through the weekly newspapers had found out about it before. There is a problem in the interpretation of this statistic because it has zero in one of the cells. This is a violation of the assumptions behind chi square. None of the other sources of informational messages showed a relationship with being aware of the runoff issues in the first place.

This suggests that the readers of the weekly newspapers are more involved in this matter than those who are not readers of this form of news.

TABLE 2
CROSSTABULATION OF AWARE OF RUNOFF AND SOURCE OF NEWS ABOUT IT

Key
frequency
row percentage

wnp	water runoff goes to creeks and streams? no	yes	Total
no	23	56	79
	29.11	70.89	100.00
yes	0	8	8
	0.00	100.00	100.00
Total	23	64	87
	26.44	73.56	100.00

Pearson chi2(1) = 3.1661 Pr = 0.075
Cramér's V = 0.1908

ANALYSIS OF CHANGES IN BEHAVIOR

Evidence in Table 3 indicates that there have been some major changes in behavior. This is clear from the frequencies of changed behavior in the categories of “never litter, not over fertilize, and recycle oil”. This data suggests that more than half of the respondents indicated that change. Those changes with responses close to 30 or more indicated a moderate amount of change. While those with less than 30 indicating a change can be seen as low in frequencies.

TABLE 3
CHANGES IN BEHAVIOR ABOUT CREEKS AND STREAMS AFTER MEDIA BLITZ

CHANGES IN BEHAVIOR	Number yes; changed behavior	Number no; did not change behavior
Q3h Never litter	65	22
Q3c Never Over fertilize	50	37
Q3b Recycle oil	45	42
Q3j Use environmentally friendly products	36	51
Q3e Pick up after pet	35	52
Q3g Use reusable shopping bags	33	54
Q3a Wash Car	31	56
Q3d Compost	31	56
Q3f Use Ashtrays	10	77
Q3i Use Clean Water Business Partners	9	78
Q3k “Other”	6	81

There are three variables about changed behavior that indicate some potential influence from the media blitz. They are 3b, 3d, 3g. Table 4 indicates the patterns of the relationship between responses to using reusable shopping bags and awareness of the runoff issue before the media blitz and after. The data suggests that five persons might have been influenced by the blitz. These are the respondents who indicated “yes” on both questions. Apparently, many persons indicated that they had knowledge of this runoff issue before the media blitz. That was almost 74% of the respondents. Of the group that responded “no” to the question of awareness, 67% had not changed their behavior in the use of reusable shopping bags. Overall, there are slightly more than 41% who indicated that they had known of the water runoff issue before the blitz and had not changed their behavior about using reusable shopping bags. Notice that almost 6% of the sample had not known of the water runoff issue and had begun to use the reusable shopping bags.

TABLE 4
RELATIONS BETWEEN USING REUSABLE SHOPPING BAGS AND THE MEDIA BLITZ.

Key
frequency
row percentage
column percentage
cell percentage

use reusable shopping bags	water runoff goes to creeks and streams? no	yes	Total
no	18	36	54
	33.33	66.67	100.00
	78.26	56.25	62.07
	20.69	41.38	62.07
yes	5	28	33
	15.15	84.85	100.00
	21.74	43.75	37.93
	5.75	32.18	37.93
Total	23	64	87
	26.44	73.56	100.00
	100.00	100.00	100.00
	26.44	73.56	100.00

Pearson chi2(1) = 3.4817 Pr = 0.062
Cramér's V = 0.2000

The next changed behavior question asks about the use of compost[ing] green waste. The data suggests that almost 5% of the respondents indicated they had not heard about the issue before the blitz but now use composted green waste. Slightly more than 66% indicated that they had heard about the run off issue before the media blitz but had not changed their behavior regarding the use of compost green waste. Slightly more than 42% of the respondents had heard of the media blitz, but had not changed their behavior. This is the cell with the response of “no” on use of compost green waste and “yes” on having been made aware of the issue of runoff prior to the media campaign.

TABLE 5
RELATIONS BETWEEN USING COMPOST GREEN WASTE AND THE MEDIA BLITZ.

Key
frequency
row percentage
column percentage
cell percentage

compost green waste?	water runoff goes to creeks and streams? no	yes	Total
no	19	37	56
	33.93	66.07	100.00
	82.61	57.81	64.37
	21.84	42.53	64.37
yes	4	27	31
	12.90	87.10	100.00
	17.39	42.19	35.63
	4.60	31.03	35.63
Total	23	64	87
	26.44	73.56	100.00
	100.00	100.00	100.00
	26.44	73.56	100.00

Pearson chi2(1) = 4.5357 Pr = 0.033
Cramér's V = 0.2283

The final point of analysis is related to the use of recycled oil . Table 6 shows the ‘t’ test on this issue. The ‘t’ test indicates whether there is a significant difference between those who were aware and those who were not aware prior to the media blitz and changes in behavior. In this instance we conclude that there is a significant difference in the means of those who indicated they had heard of the issue before the media blitz and those who had not. Those who had heard before changed their behavior more than those who had not. This suggests that the score is in the wrong direction to support the hypothesis that the media blitz had a significant affect on the respondents about the management of recycled oil.

TABLE 6
"t" TEST BETWEEN THOSE AWARE BEFORE THE BLITZ AND CHANGED BEHAVIOR ABOUT THE USE OF RECYCLED OIL

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Two-sample t test with unequal variances
------------------------------------------------------------------------------
   Group |     Obs        Mean    Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
      no |      23    .3913043     .104051    .4990109    .1755159    .6070928
     yes |      64       .5625       .0625          .5    .4376037    .6873963
---------+--------------------------------------------------------------------
combined |      87    .5172414    .0538843    .5025995    .4101229    .6243599
---------+--------------------------------------------------------------------
    diff |           -.1711957     .121379               -.4167143     .074323
------------------------------------------------------------------------------
    diff = mean(no) - mean(yes)                                   t =  -1.4104
Ho: diff = 0                     Satterthwaite's degrees of freedom =  38.9677

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 0.0832         Pr(|T| > |t|) = 0.1663          Pr(T > t) = 0.9168
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CONCLUSIONS

There are problems with this data. It is too small a sample and the response rate is way below standards of appropriate sampling. Using statistical tests the data does not support the view that the media blitz had an affect on changing the behaviors of the respondents with respect to three items in the questionnaire. They are Q3b, Q3d and Q3g. The questions are "…have you changed to protect local creeks and streams from polluted water runoff?" related to these items:

1. recycle used auto oil
2. use compost green waste
3. use reusable shopping bags, rather than plastic bags

The problem in the structure of the questionnaire is that there is a mixture among those who indicate they have been aware of the problems before the media blitz. It is not possible to separate out those who were specifically influenced by the blitz and their subsequent behavior.

If the questionnaire had been altered it might have provided clearer information about the impact of the awareness campaign and changes in behavior. Another

question such as “do you think hearing of the issue through the media you indicated in the first questions about media use, might have changed your behavior on these matters in Question 3? “ If a question of this sort had been in the questionnaire it might have provided a clearer understanding of the changes in behavior and the influence of the media blitz.

APPENDIX A
MAIL OUT QUESTIONNAIRE

Thank you for participating in this very important follow-up Chico Urban Streams Alliance (Chico USA) mail-in survey! We thank you also for your participation in the original telephone survey last September, 2005. **Taking a moment to respond now helps protect our local water quality!**

1. Which of the following educational messages about potential for polluted water runoff from yards, driveways, and gutters draining directly to the creek did you hear, or see, in the last year?
   (Check all that apply)

   a._____Television
   b. _____Radio
   c. _____Daily Newspaper
   d. _____Weekly Newspaper (www.becnet.org)
   e. _____Posters
   f. _____Cal Water Bill Inserts
   g. _____Chico USA Booth at a public event
   h. _____Chico USA Brochure
   i. _____Internet
   j. _____Murals (downtown Chico)
   k. _____Other (Please specify)
   _____

2. Were you aware of the fact that water runoff from your yard, driveway and gutter drains directly into our creeks and streams before hearing or reading this message?

   Yes_____ **No**_____

3. Which of the following behaviors have you changed to protect our local creeks and streams from polluted water runoff? (Check all that apply)

   a. _____Wash your car on the lawn, or at a car wash, instead of in the driveway.
   b. _____Recycle used auto oil.
   c. _____Not over-fertilizing your lawn; Not applying fertilizer and/or pesticides to your lawn before it rains; Not over-watering your lawn.
   d. _____Compost green waste.
   e. _____Pick up after your pet and dispose of the waste in the trash can.
   f. _____Use ashtrays, rather than dropping cigarette butts on the ground.
   g. _____Use reusable shopping bags, rather than plastic bags.

h. _____Never litter.
i. _____Use Clean Water Business Partners to landscape your lawn and/or clean your carpets.
j. _____Use environmentally-friendly cleaning products and/or gardening methods.
k. _____Other (Please list other changes you have made to protect our local waterways.)

Chico USA is a team effort to prevent runoff pollution from entering our waterways through our gutters and storm drainage system. Chico USA partners include: **the City of Chico, the Big Chico Creek Watershed Alliance, the Butte Environmental Council, and Kennedy/Jenks Consultants.**

*The Chico USA Clean Creeks Project is funded by **Proposition 13 and The California Bay-Delta Program (CalFed)**, and managed by the California Regional Water Quality Control Board.*

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