FOSSIL CREEK MONITORING PLANNING MEETING JUNE 1, 2004

Attendees:

Charlie Schlinger, NAU Janie Agaygos, USFS Ken Anderson, USFS Leslie Myers, USBR Grant Loomis, USFS Justin Jimenez, USFS Pam Sponholtz, USFWS Michele James, NAU Rod Parnell, NAU Abe Springer, NAU Bill Auberle, NAU Lorrie Boy, NAU Matt Jedra, NAU Marty Lee, NAU Phil Smithers, APS Jane Marks, NAU Frank Brandt, N. AZ Audubon Society

Handouts

Agenda (see below)
Overview of NAU Fossil Creek Project-Pulliam Trust Initiative (2 pages)
Monitoring Planning Matrix-Fossil Creek Pulliam Trust Initiative, Draft of June 1, 2004 (1 page chart)
Draft Econotes from Fossil Creek: Volume 1, Stream Ecology and Restoration Group, prepared by Jane Marks and others (6 pages).
Fossil Creek Recreation Monitoring Program Meeting-June 1st, 2004, prepared by Marty Lee (1 page)

Agenda

Fossil Creek Monitoring Planning Meeting Northern Arizona University, Flagstaff Bilby Research Center Conference Room 8 AM to Noon, Tuesday June 1st, 2004 Agenda

- ➢ Welcome!
- Introductions
- NAU's Involvement in Fossil Creek Overview of Pulliam Trust Initiative
 On-line repository for completed studies, data, etc. digital data only
 - First outreach meeting of several planned over the next 10 months

- A limited number of invitees to this first meeting
- Future meetings will have a broader audience, incl. public participation
- Monitoring Planning
- objective: a mostly completed planning matrix, which will feed into development of a monitoring plan
 - o Discussion based on a strawman of monitoring plan/matrix
 - What should be monitored, who should be monitoring, funding
 - What must be monitored, who must be monitoring, funding
 - o Ongoing and planned monitoring: who, what, when, where, why
 - What are appropriate measures of success?
 - o Data gaps
- > Input for the *State of the Fossil Creek Watershed Report*
- *• objective: guidance for the watershed report*
 - Were this report to be of value to stakeholders, APS & USFS, what would it contain?
 - Possible sections
 - Volunteers/assignments
 - o Timeline
- Closure Next Steps
- ➤ Where do we go from here?
 - Draft Monitoring Plan Fall 2004
 - Draft Watershed Report Late Fall 2004
 - 2+ additional participatory meetings

There is a large (should be mostly empty) parking lot (P36) on the east side of the Bilby Center that is available for folks attending this meeting.

For those who will join us by conference call: the number to call is 928-523-9119. *If you are the first one who calls, it will just ring and ring; let it ring until someone else joins the call.*

For maps of the NAU campus, please visit: www.nau.edu/web/maps.shtml

OVERVIEW OF PULLIAM TRUST INITIATIVE

"A Comprehensive Monitoring Plan for Fossil Creek Watershed Restoration." Started in March 2004, this is a one year initiative funded by the Nina Mason Pulliam Charitable Trust.

Objectives: inform, monitor, and evaluate the decommissioning and restoration actions; coordinate participation of diverse interest groups; and encourage dissemination of results.

The initiative has six goals:

1) Document the baseline condition of the watershed prior to restoration of full flows;

2) Design and initiate a long-term monitoring and assessment program to measure restoration progress;

3) Provide tangible, science-based recommendations to the USFS, APS, FERC, and other decision makers;

4) Facilitate participatory meetings among agencies, conservation organizations and local stakeholders to identify concerns related to monitoring and restoration and further refine the monitoring plan and restoration process;

5) Develop an adaptive management process; and,

6) Disseminate lessons learned in the popular and scientific press; create an on-line repository for project reports and information for use by agencies, conservation groups and others to guide and inform other dam removal, decommissioning and restoration projects and actions.

Partners include: APS, USFS, FERC, AGFD, BR, FWS, Audubon, TNC, San Carlos Apache and Yavapai Apache Nations, American Rivers.

NAU PIs: Jane Marks, Bill Auberle, Abe Springer, Martha Lee, Charlie Schlinger Project coordinator: Michele James Project accountant: Pat Ponce

Project timeline: March 2004-March/April 2005.

Pulliam is willing to entertain additional proposals for additional years, but no assurances of support at this time.

There are a limited number of invitees at this meeting so that NAU can get organized prior to having broader participation from public and others in future meetings.

MONITORING PLANNING

A Draft Monitoring Planning Matrix was handed out. Charlie indicates that this is a first cut put together recently that indicates various monitoring actions, describes the focus, the driver, the timing and duration, indicates responsible party(ies) and the status of funding. Below is a summary of the discussion related to this matrix:

Rod Parnell: Travertine. This work is an extension of work completed by Malusa at Fossil Creek and it examines the rates of travertine deposition in various reaches to get a handle on the rate at which it forms. This includes the use of natural and artificial substrates. Rod has found that the rates of deposition are fluctuating but that travertine is always forming. Deposition is occurring even when at flood stage. Seven different travertine dam complexes being monitored. The monitoring will be continuing into the time period after flow restoration. This work also ties into algae communities and decomposition rates (Jane Marks' work). The driver for this work is science, although habitat stability is important to look at, particularly for large flood flows and to see how long it takes to reestablish travertine dam environments.

Charlie: *Stehr Lake*. Paul Gremillion (NAU civil & environmental engineering) took core samples from Stehr Lake last week (several 1 meter sediment cores) and will examine the history of carbon deposition and mercury in sediment. Focus is on the watershed. Driver is science. This work started in May 2004 and will continue for 1 year. Some funding has been secured through ADEQ and the Verde Watershed Research & Education Program.

Marty Lee: *Recreation impact monitoring*. Follow-up on initial work started by USFS and includes campsite inventory and monitoring of recreation. This monitoring will be done through the use of permanent plots to look at how the flow restoration will affect recreation. The monitoring is based on the draft management plan for Fossil Creek, which included recommendations to not allow camping by springs, etc. A visitor survey is planned (who, why they come, benefits received, reactions to proposed management plans, etc.). Trail and road counters will be installed. Permanent monitoring plots will be located at high impact areas. USFS will not have resources to do a lot of monitoring or enforcement, so Marty will look at the state of knowledge about what types of enforcement, etc, will be useful for USFS to conduct such as interpretation and education of visitors, rather than on-site enforcement. The visitor surveys and monitoring plots will be part of the long-term monitoring at Fossil Creek.

Abe Springer: Spring characterization and studies, water chemistry. Assumptions for decommissioning are based on spring discharge rates; Abe will look at how discharge may change with drought, how it may vary over time, and short and long term discharge and chemistry. His work will determine the actual physical location of each spring orifice and the amount of discharge from each orifice. Chemistry related to individual spring orifices will also be examined. Researchers at the University of New Mexico have been looking at travertine and trace gasses at Grand Canyon and are interested in applying this technique to Fossil. Steve Flora's Middle Verde springs thesis work is posted on the NAU Department of Geology website. Abe also indicates that the potential for new gauging station at Fossil will be discussed as well. Larry Stevens and Abe will be applying their unified stream classification to Fossil Creek as well.

Jane Marks: *Ecology/fish/macroinvertebrates/crayfish/foodbase*. Jane passed out a draft report ("Stream Ecology and Restoration Group: Econotes from Fossil Creek, Volume 1"). Her team is examining a broad range of issues at Fossil Creek, including: 1) How changes in travertine will affected fish, algae, and macroinvertebrates. To date, they have found more diversity in travertine zones. 2) Two years of fish surveys. They have found that the percentage of exotics increase as you go downstream, and that there are a lot fewer fish in lower reaches although they are bigger. 3) One year of crayfish monitoring—trapping and visual surveys. The have found a population above the large waterfall (recent), but no crayfish above the diversion dam. Bass eat crayfish, so they

have concerns about an increase in crayfish when bass are removed. Jane indicates that it may be beneficial to do lots of trapping for the first couple of years. 4) Using stable isotopes to look at food base and determine trophic positions of fishes and competition. Above the diversion dam, native fish have high trophic positions. The opposite holds true below dam due to competition with non-native fish. Macroinvertebrates above the diversion dam are widespread, below dam they are compressed together and using the same resources. Jane indicates that she has a NSF grant for this macroinvertebrate work and is concentrating on eight sites. They will track the food web in years 2, 5 and 10 at the eight sites. This work will set a precedent on how restorationists determine success. Herp survey information is being worked up as well.

Justin Jimenez: *Leopard frog monitoring*. The focus of this work is on the riparian stream corridor. The drivers are science, regulatory and adaptive management. With FERC issuing the surrender order, the lowland leopard frog (FS sensitive) population above dam will be monitored. The USFS is working with APS to handle this through adaptive management. FERC identified this as concern in the FEA (Final Environmental Assessment) and stated that adaptive management can be conducted through Dec. 31, 2009. USFS and AGFD are working on a monitoring and adaptive management strategy for the lowland leopard frog: 1) monitoring presence/absence/distribution prior to and after removal of dam—done yearly in drainage; 2) monitoring development of replacement riparian habitat—two part survey, basin-wide emphasis, with methodology to document in-stream habitat with focus on establishment of emergent vegetation important to frogs; 3) monitoring persistence of frogs prior to, during and after removal of dam—numbers and monitoring of populations. Justin has a draft adaptive management strategy he can send out to folks later this week.

Ken Anderson: *Archeological resources*. A HPMP (Historic Properties Management Plan) has been completed that details how they will deal with cultural and historic resources related to the deconstruction process. There has been coordination on how they will manage monitoring and retention of historic features. The process was developed through section 106 compliance through SHPO. This plan has been accepted.

Charlie Schlinger: *Sediment and stream hydrology*. This work is part of Laurie Boy's master's project. Will begin work this summer on the riparian corridor and focus on stream morphology of entire reach. Stream classification will examine hydrology and sediment transport with the long-term objective of tracking changes in sediment distribution. This action will provide considerable baseline information. Work will continue for as long as funding permits. Partial removal of dam in 2007, so want to look at effects over this time and longer.

General Discussion:

• Riparian vegetation monitoring being conducted in watershed related to leopard frogs?

Not being done.

• Is anyone looking at enhancement of habitat for southwestern willow flycatcher and yellow-billed cuckoo?

Justin indicates that some monitoring is planned for the flycatcher (with FERC); Janie has been doing research on riparian vegetation.

Janie indicates that she is working with the Tonto NF folks to use monitoring methods to look at vegetation, including woody vegetation. Methods they will use include density, transects, frequency, and cover, and measuring vertical structure. This work will be modeled after the work the Tonto is doing and is a combination of methods to monitor vegetation. Justin has pulled together a small team to deal with monitoring. The USFS wants to do baseline work and are trying to figure out how to do it.

- Jane indicates that Tom Whitham's team may be able to help monitor riparian vegetation.
- Monitoring of flycatcher, cuckoo and common black hawk?

This work has not been addressed by anyone right now. Justin has focused on frog monitoring thus far. Janie indicates that existing methodologies exist for flycatcher and cuckoo. Surveys done for flycatcher in 1995 and 2000 (?) and habitat is currently very limited because the gradient is too high and channel height is too incised for good habitat, however, presence will be monitored. There is a good potential for cuckoos to be present; there are reports of cuckoos at Fossil and Janie suspects breeding is occurring there and very possible in good numbers.

• Any work at headwaters?

Jane has done some work at pools looking at water quality and macroinvertebrates and she has about a year of data for these pools. Abe indicates that the long term Mogollon Rim sediment history (last 14,000 yrs) is being studied by Diana Anderson

• Is anyone looking at groundwater wells and development?

Abe indicates that this is part of his work with spring monitoring. Also USGS, Mogollon Highlands, included this in their studies looking at long-term (2007) regional groundwater flow model from Upper Gila to Grand Canyon. The Pine/Strawberry Water District had a comprehensive report done recently. Leslie Myers is doing geologic mapping and conceptual water monitoring and hopes to have this completed by end of year; it includes Fossil Springs.

• Gauge at Fossil?

Leslie says they are talking about it. Charlie indicates that there is a lot of interest in this. Perhaps a subgroup should be formed—Abe, Charlie, Leslie, others, to move along with getting a gauge. Abe suggesting talking with USGS. The USGS Mogollon Highlands report is available from (Don Bills) and is out for peer review.

• When can a basic stream morphology map be completed?

Jane indicates that AGFD have the Excel files of work completed by Mark Whitney. Charlie indicates that they will apply Montgomery and Buffington scheme to classification. Charlie wants to know where others are establishing transects. He plans on working on the entire reach. He will start this work this summer/fall. Classification involves riffle/pool, bedrock, etc. using GPS (high accuracy) and determining reaches of different classifications. Buffington method is not set in stone. Grant pointed out that the USFS uses Rosgen. Charlie indicates that NAU could possibly use both methods and they will look into that.

• Is aerial photography of the riparian area available?

Janie indicates that the most recent photos the USFS has is 2001 or 2002 and she is not sure that they have these in the office (they do have 1998 in the office now). These are the standard aerial photos—1:24,000 and some 1:12,000. Janie will look into whether they have the more recent photos. Grant indicates that they may be getting an additional flight done next year. Janie indicates that District may not have purchased the most recent ones. Charlie indicates they want photos of entire reach in winter and in summer. Grant asked if the most recent USFS flights are adequate? Charlie indicates that it may be useful for some research, but the overall concern is with the resolution of the photos. Grant indicated that aerial surveys were done by AGFD a few years ago; but Pam says that it is very coarse information and would likely not be that useful. Marty indicates that the more recent the photos the better for her work on recreation on the lower reaches. Phil Smithers indicates that APS did some aerial photos of their project site, but he's not sure they covered all of Fossil. Abe indicates that he'd like to see the riparian corridor flown this year. Charlie would like to see this done as well, with high resolution. Bill Auberle indicates that he thinks routine photography should be done as part of the on-going monitoring process. Charlie will talk with Cooper Aerial to see what they might be willing to do.

Next steps related to monitoring:

Charlie would like annotations on the strawman matrix to him in a week. He would like a few paragraphs of narrative for each action. We would like to develop monitoring plan that follows the matrix—these narratives would be posted on the project website which is being developed this summer. All the monitoring that is being conducted will be described in one place; this will be composed of the matrix and a narrative and a contact person.

Charlie would like monitoring narratives sent to him by mid-July. This should be in the form of an executive summary (a few paragraphs).

Grant would like to get copies of actual monitoring plans and protocols being used so that everyone can minimize overlap and coordinate this field season. It would be most helpful to put this up on the website. Protocols can be included, or at least named in the narrative.

It was decided, for now, that the monitoring plan will contain: 1) narrative; 2) matrix that can stand alone, and; 3) appendix/appendices that contain protocols, study locations, timelines/frequencies for monitoring, and an introduction to other monitoring projects, including how this project fits into larger scale world (context; with similar types of projects that are going on elsewhere).

STATE OF THE FOSSIL CREEK WATERSHED REPORT

This is a deliverable identified in the Pulliam proposal. NAU would like guidance from this group regarding the outline and content of report. What would be of value to stakeholders? How can it be of value for management decisions?

Ken Anderson: USFS's biggest challenge is managing the people once APS has left. What will USFS be doing to maintain and manage resources in 2010? To which components of the watershed and what indicators of condition and trend do we need to pay attention to in order to determine success? The issues for the USFS are native fish, more recreationists, and limited resources. The USFS would like to know: to what they should give attention to in order for them to know if specific action is needed. Monitoring related to every day management concerns/factors should be identified in the Report.

Phil Smithers: APS is required to conduct some monitoring according to FEA. They will be there for 5 years doing deconstruction and would like to have the Report break down what is being done.

Pam: Ability to detect change is most important. "The people will come!" Pam would like to know about changes in fish, macroinverts, riparian vegetation and how these relate to increased visitorship; the goal would be to learn how the USFS can change management goals in future if necessary.

Salient issues/topics?

Ken Anderson's idea:

1) Synopsis of how we got to this point—background/history; setting; how it will change over the next few years. Need to understand possible changes over the short and long term. Summarizes what the monitoring is and why.

2) Now that monitoring is being done, describe what's been learned each year—trends and implications based on monitoring, etc.

3) Based on these implications, what is the best management plan based on this info (FS role)? Ken is envisioning a status update in 2004, 2005, 2006...state of watershed is one chapter in a bigger management plan.

Grant: Would like the Report to look at the condition of watershed as it is today, how stable, vs. what its potential is. This is a way of looking at recreation, roads, and grazing impacts. Look at the watershed condition – uplands, ground cover and potential groundcover (USFS Terrestrial Ecosystem Survey), sediment erosion, peak flows and potential.

Pam: Would like to see the Report integrate all concepts—spring water chemistry and how it relates to invertebrates...put them together. What does it all mean?

Janie: Suggests breaking the Report into chapters similar to how the USFS does NEPA documents:

Physical environment-water, hydrology, chemistry

Soils—uplands, sediment, travertine

Vegetation—upland, riparian

Wildlife—fish, inverts, birds, amphibians

Social environment—recreation, grazing, roads, etc.

Grant told us that a watershed report has been done. Janie indicates that the USFS Fossil Creek Watershed Management planning process was started, but is now on hold. The USFS has a lot of specialist reports completed—she did one, Mark Whitney did one, soils has been done. Janie is not sure NAU has seen these reports. NAU has not.

Abe: Suggests completing a large conceptual ecosystem diagram—expand the simple one Jane has at the beginning of her draft report. This will tie into matrix. Graphic artist can show connection of physical and chemical and human processes and link monitoring to impacts. He is envisioning a large conceptual diagram.

Justin: Believe the critical item is to make sure that the Report documents the results of monitoring and synthesizes these results. Lots of data everywhere and it's in file cabinets. Gathering the bits and pieces of info is most important. Need to know what's been done. NAU should do this.

Charlie would like the results of monitoring to be funneled to him—preferably in digital form. Mail, e-mail it to him.

Janie indicates that all the USFS information (files) will be housed with Kath Farr at the Supervisors Office (developed for the "Draft EIS for Fossil Creek Management

Planning"). Most of it is in hard copy form. Judy Adams was to get everything to Kath (Judy is on detail at the Supervisor's Office in Flagstaff). Janie put together bibliography for FERC—Grant will share this with NAU. Michele will look at what FS has at the SO.

Bill stated that the audience of the Report is both the agencies and public.

Pam said we must figure out how to deal with proprietary information such as threatened, endangered and sensitive species locations, etc.

Charlie committed to pulling together a draft outline for the Report and will get it out to everyone. He would like to have an agreed-upon outline by the end of July. If anyone interested in writing a chapter or parts, please let Charlie know.

CLOSURE: WHERE DO WE GO FROM HERE?

Additional participatory meetings: Bill Auberle says that NAU plans to have stakeholders involved in developing the monitoring plan so that it can be replicated in other projects. He wants to engage all interests. This meeting was the beginning and represents a subset of those directly involved in monitoring. Bill says that the challenge is when to have additional meetings and get others involved. He suggests that this will likely occur in the late summer or early fall—when we have a straw person out there for public response, and annotated matrix. The downside of this is that baseline monitoring needs to be done this summer and that there is a potential disconnect.

Ken Anderson—will just have to move forward and deal with this potential disconnect.

Bill would like to have everyone's input on the public process; he expects to have materials together and hold events in September or thereabouts.

Ken Anderson indicates that the funding was pulled on the USFS Fossil Creek Management planning project, so they will not be working on it this fiscal year. They are in a holding pattern for the rest of the fiscal year. The USFS will participate because it is a benefit to their efforts and they will do their best to help support it, but it will be a challenge. The USFS is actively supporting deconstruction process. He hopes the management plan will be re-started, but he's not sure. USFS now has an emphasis on fuels management and this is drawing funds from other projects. Will try to get the project back on line, but may be procedurally impossible in the foreseeable future.

Phil: APS has not determined a plan for public involvement at this point. Does not anticipate finding extra funds to help with this, but will support it as they can.

Recap of decisions on the monitoring plan (Charlie):

He would like to receive input from everyone on the draft matrix that has been circulated; narrative from each person; appendices—protocols, etc.

Draft monitoring plan completed in late summer, but with earlier draft out before that.

State of Watershed Report—outline for feedback in late July. Draft report out in early winter.

Next public meeting-fall 2004 with broader audiences.

Justin—would like FS monitoring and NAU monitoring to be shared to make sure there is not overlap for this field season. He suggests that this be done ASAP in order to minimize disturbance and not collect the same information. What will be going on this field season—Ken would like to know. Leopard frog—need to coordinate with AGFD and USFS, for instance.

Ken would like all of NAU researchers to coordinate with Janie.

Inventory of baseline monitoring plans—NAU can do this. Send Charlie a bulleted list of monitoring being conducted—baseline first, then long-term. This field season first—who, what, where, protocol, timeframe, etc.

Ken indicates that there is some potential for a full Forest closure, but the next couple of weeks will tell. The USFS has discretion to permit access of selected individuals.

Marty suggested that information be posted for public regarding research, importance of area, etc. NAU could take initiative and use existing kiosk. Ken says a flyer would be good. The flyer would need to adequately address the sensitive issues in the area. Ken would like to see this flyer pulled together—and suggested coordination amongst Connie Birkland, Marty, and Michele. Phil would like to see some of the APS work included on the flyer, specifically their activities. Marty suggested a project "newsletter" as an extension of the outreach. Build a communication plan.

A conclusion is that it is most important to know what is being done this summer to determine baseline conditions—who and when and what will be done? This coordination is very important due to limited resources. Study plans for this summer can be posted on a web site (NAU can help facilitate this).

<u>Monitoring that will be occurring this summer includes</u>: Justin is putting together a report on surveys/monitoring of leopard frogs and birds (cuckoo and black hawk), as agreed upon between USFS and APS. What may need to be done for flycatchers may come out of the FWS consultation process. The native fish restoration project should occur prior to decommissioning to be most effective—additional monitoring associated with that project. BR is working with NAU on some monitoring—draft proposal is out—will be working with FWS on this (Pam and Jane). BR does not require any habitat monitoring. Fish and macroinvertebrates monitoring will be done by NAU/FWS.

SUMMARY OF ACTION ITEMS DISCUSSED AT THE MEETING

Send annotations of the strawman monitoring matrix to Charlie ASAP.

Charlie would like a few paragraphs of narrative for each action outlined in the matrix sent to him by mid-July (these should be in the form of an executive summary). Charlie will use these to develop a monitoring plan that follows the matrix. These narratives will be posted on the project website which is being developed by Michele and others this summer.

Monitoring of southwestern willow flycatcher, yellow-billed cuckoo, and common black hawk needs to be addressed.

Justin Jimenez will send out a draft adaptive management strategy for lowland leopard frogs to those who would like a copy.

A subgroup will be formed composed of Abe, Charlie, Leslie, USGS, and others to begin the work to get a gauge at Fossil Creek.

Complete a basic stream morphology map: Charlie will look into which stream classification is appropriate – Rosgen or Montgomery and Buffington, or a combination of both?

Janie will look in the availability of the most recent USFS aerial photos (2001 or 2002) and if any additional flights have been or will be done this year. Do they cover the entire riparian corridor and at what scale? If these photos are not adequate, Charlie will talk with a company to arrange for photos to be taken.

Grant would like everyone to share copies of the monitoring plans and protocols that everyone is using this summer so that everyone can minimize overlap and coordinate work this field season. This information can be sent out via e-mail to participants and/or placed on the website that Michele is developing. Send your monitoring plan(s)/protocol(s) to Charlie and Michele (Michele.James@nau.edu)

NAU will secure copies of relevant work completed by the USFS Watershed report and relevant specialist's reports for *Fossil Creek for the State of the Watershed Report*.

Abe would like NAU to look into hiring a graphic artist to complete a large conceptual ecosystem diagram for the *State of the Watershed Report*.

Send results of your monitoring to Charlie, preferably in digital form.

Michele will follow-up with Judy Adams to get copies of relevant parts of the USFS "Draft EIS for Fossil Creek Management Planning."

Grant will share with NAU the bibliography that Janie put together for FERC.

The *State of the Watershed Report* must deal appropriately with proprietary information such at threatened, endangered and sensitive species locations, etc.

Charlie will put together a draft outline of the *State of the Watershed Report* to everyone and he would like to have an agreed-upon outline by the end of July. If you are interested in writing a chapter or part(s) of a chapter, contact Charlie. NAU would like to have this report out early this winter.

NAU will plan a participatory public meeting for this fall (about September).

Charlie will complete a draft monitoring plan by late summer and will share drafts of this plan with others between now and then.

NAU researchers should coordinate with Janie.

Send Charlie a bulleted list of the monitoring you are conducting (baseline, long-term); priority is to send a summary of this field season's work (who, what, where, protocol used, timeframes, etc.).

NAU (Marty and Michele) will work with USFS (Connie Birkland) and APS (Phil) to determine appropriate public information to be posted on the existing kiosk and look into the possible creation of a flyer.