2010 Strategic and Action Plans for the Ada County Weed, Pest, and Mosquito Abatement Departments

Brian Wilbur, Director
Jacob Mundt, Administrative Operations Manager
Lyle Larkin, Weed and Pest Control Field Operations Manager
Jack Bennett, Mosquito Abatement Field Operations Manager

Preparation Date – 2/8/2010

Table of Contents

Strategic Plan 3
Ada County Core Components 3
Weed, Pest, and Mosquito Abatement Department Core Components 4
Administration Division Level Missions, Outcomes, Goals, and Measures. 5
Weed Control Division Level Missions, Objectives and Goals. 6
Pest Control Division Level Missions, Objectives and Goals. 9
Mosquito Abatement Division Level Missions, Outcomes, Goals, and Measures. 11
Action Plan – Administrative Division 12
Introduction 12
Administration Management 12
Reception 12
Accounting 13
Geographic Information Systems 13
Facilities, Safety, and Inventory 15
Action Plan – Weed Control Field Operations Division 17
Introduction 17
Noxious Weed Action Plan 17
Justification 17
Early Detection/Rapid Response (EDRR) Policy 19
State Wide Control Policy 20
State Wide Containment Policy 21
Action Plan – Pest Control Field Operations Division 22
Introduction 22
Statement of Purpose 22
Pest Overview: Pocket Gopher 22
Pest Overview: Rock Chuck 22
Personnel 23
Work Order Management 23
Control Methods for Pocket Gophers 23
Control Methods for Rock Chucks 24
Action Plan – Mosquito Abatement Field Operations 25
Introduction 25
Statement of Purpose 26
Life Stage Management Strategies 26
Trapping and Surveillance 28
Mapping and Monitoring 29
Acknowledgements 29
Appendices 30
Appendix 1: Sample Field Application Report 30
Appendix 2: Sample Office Application Report 31
Appendix 3: Sample Mosquito Site History Summary 32

Strategic Plan

Ada County Core Components

Philosophy

- Built on a foundation of our values -- humanity, excellence, integrity, trust and stewardship -- we serve as leaders in our community.

Values

- Humanity, Excellence, Integrity, Trust, Stewardship

Vision

- To be a premier governmental entity, demonstrating fiscal responsibility and professional excellence, and to be recognized for providing innovative and proactive solutions for our communities through open and accessible government.

Mission

- To provide effective and efficient services and programs that enhance our community's quality of life.

Strategic Priorities

- Provide for an effective and efficient judicial system.
- Provide public safety, security, and health services.
- Ensure government efficiency and financial stability.
- Provide excellent public services.
- Provide for growth and resource management.
- Ensure regional collaboration and cooperation.
- Support a healthy economy.

Weed, Pest, and Mosquito Abatement Department Core Components

Philosophy

The Ada County Weed, Pest and Mosquito Abatement Program:

- Is primarily tax funded, with limited revenues obtained from application fees
- Provides Ada County residents with education, information and services
- Exists with checks and balances in place to reduce tax impact as much as possible
- Supports the Ada County quality of life
- Uses "best practices," state of the art techniques, and innovation whenever possible
- Stresses education (for staff and the public)
- Emphasizes dependability, maintenance of the public trust, transparency (clear view of the department by the public), commitment, conviction, and credibility with the BOCC and public

Values

- Customer Service, Fair and Equitable
- Efficiency
- Frugality
- Honesty
- Integrity
- Teamwork

Vision

- To provide cost-effective and efficient weed, pest and mosquito abatement management services to enhance the quality of life for the citizens of Ada County.

Mission

- To utilize cost efficient methods and streamlined work flow processes to maintain the health of our natural environment and protect the health of the residents of Ada County.

Administration Division Level Missions, Outcomes, Goals, and Measures.

Mission

The mission of the Ada County Weed Pest and Mosquito Administrative Division is: To foster a unified administrative approach to coordinate weed, pest and mosquito abatement activities.

Outcomes Goals, and Measures

- Outcome 1 – Integrate data collection, analysis, and reporting functionality to support WPM Services
    - Goal 1: Utilize GIS and GPS to record data where chemicals are applied and inspections are performed.
        - Measure: Create reports that summarize the areas / lengths of applications.
        - Measure: Create reports that summarize applications where GPS was not used.
    - Goal 2: Utilize GIS to generate formal and informal application reports.
        - Measure: Meets ISDA requirements and passes audit.
    - Goal 3: Monitor and Manage product inventory.
        - Measure: Create reports that contrast chemical check out vs chemical usage.
        - Measure: Create reports that itemize product needs based on recommendations.
    - Goal 4: Utilize Time and Attendance to comprehensively account for staff time.
        - Measure: Summarize employee activity by Type over periods of time
        - Measure: Analyze time usage and make duty change recommendations.
    - Goal 5: Utilize call management interface to model client needs.
        - Measure: Develop reports summarizing client needs / call frequency.
        - Measure: Define target groups for education / service information.
- Outcome 2 - Coordinate Weed, Pest and Mosquito Abatement resources to support WPM missions.
    - Goal 1: Coordinate resources and staff to ensure timely service.
        - Measure: Quantify response time to work orders.
        - Measure: Survey clients to assess their impression of response time.
    - Goal 2: Coordinate critical business areas such as budgeting and policy.
        - Measure: Quantify budgetary requests vs encumbrances.
        - Measure: Quantify and document safety policy infractions.
    - Goal 3: Coordinate internal training and education efforts and facilitate cross-training where feasible.
        - Measure: Quantify how many people have had what kind of training.
- Outcome 3 - Conduct an annual review of WPM cost-effective measures.
    - Goal 1: Conduct a financial review and a financial audit on an annual basis
        - Measure: Summarize outstanding balances, write offs, and encumbered funds.
        - Measure: Tabulate the average time balances remain outstanding.
        - Measure: Evaluate optimal start and end dates for seasonal staff.
    - Goal 2: Conduct an operational analysis to confirm cost-effective and efficient missions and objectives
        - Measure: Estimate drive time efficiency for applicators
        - Measure: Cross check inventory check out vs chemical applied by applicator
- Outcome 4 - Provide public education to Ada County residents on weed, pest and mosquito abatement issues
    - Goal 1: Continue ongoing public education programs and research new potential programs
        - Measure: Tabulate how many people reference the Pest of The Month Website.
        - Measure: Tabulate how many people call the office for weed information.
        - Measure: Tabulate how many tri-folds or informational flyers are distributed each year.
    - Goal 2: Continue to develop the website as an on-line resource for services and public education
        - Measure: Tabulate internet traffic
    - Goal 3: Establish a group e-mail or Newsletter that will be delivered to neighborhoods, homeowner associations, and other key groups
        - Measure: Tabulate how many recipients are on the list
        - Measure: Tabulate how many newsletters are sent through the year
- Outcome 5 - Conduct ongoing customer satisfaction checks in weed, pest and mosquito abatement service areas
    - Goal 1: Follow up on all complaints or suggestions from citizens (customers) and provide reports of all follow ups to the appropriate manager
        - Measure: Tabulate the number and type of customer complaints
    - Goal 2: Send surveys to clients and prospective clients to determine if activities are adequate or need programmatic adjustment
        - Measure: Tabulate survey responses

Weed Control Division Level Missions, Objectives and Goals.

Mission

The mission of Ada County Weed Control is to manage and control noxious weeds throughout Ada County, pursuant to Idaho Code Title 22, Chapter 24. The Strategic Priorities are: To provide public safety, security and health services and to provide excellent public services

Objectives And Goals

- Outcome 1 - Comply with all applicable federal, state and local laws.
    - Goal 1: Ensure employees are familiar with the content and impact of federal, state and local laws, especially those regarding noxious weeds and weed control measures.
        - Measure: Review herbicide Labels and MSMS before each spray season.
    - Goal 2; Annually meet with the Ada County Prosecuting Attorney's Office to review changes in federal, state and local laws, if possible prior to the weed control season.
        - Measure: Review the SRV system for legal requests.
- Outcome 2 - Locate and identify noxious weeds in Ada County.
    - Goal 1: Utilize the survey program (in use by all employees) to map identified noxious weeds
        - Measure: Record mapping of weeds in GIS data.
    - Goal 2: Use GIS Mapping tools to database the identified noxious weeds, and then provide those maps to all employees for eradication and updating.
        - Measure: Record return trips to reported weed infestation locations.
    - Goal 3: Cross-train Mosquito Abatement and Pest employees in noxious weed identification and then gather their input for Weed research.
        - Measure: Record seminars on weed control attended.
    - Goal 4: For "Control" only noxious weed patches, use surveying tools to ensure control and update as necessary.
        - Measure: Enter data in the GIS system.
    - Goal 5: Work with the public to continue identification and mapping of weeds as reported (telephone calls, pest response calls, mosquito abatement treatments and e-mails, for example).
        - Measure: Record the requests for weed identification from the public.
- Outcome 3 - Upon request or as a result of an enforcement action, control noxious weeds using Integrated Pest Management
    - Goal 1: Conduct enforcement actions against public and private landowners, as required, enforcing applicable Idaho state statutes
        - Measure: Record the number of Enforcement Letters mailed.
    - Goal 2: Issue violations and compliance letters to public and private landowners, as appropriate, with the assistance of the Ada County Prosecuting Attorney's Office
        - Measure: Record the number of Compliance Files opened for the period.
    - Goal 3: Assist with noxious weed control for private landowners to the point that they are capable to continue control on their own
        - Measure: Record spray tickets generated for the period.
    - Goal 4: Recommend the most cost-effective product for continuation of the landowner's controlling noxious weeds
        - Measure: Record the requests for chemical recommendations.
    - Goal 5: Assist other governmental agencies with noxious weed control in order to avoid duplication of effort.
        - Measure: Record the work orders generated with other government agencies.
    - Goal 6: Use a cost-plus systems for setting billing rates, adjusted as needed based on the changing economy and set before each control season.
        - Measure: Review cost plus billing system after each chemical bid process.
    - Goal 7: Collect fees, as appropriate, from public and private landowners receiving noxious weed control assistance.
        - Measure: Monitor accounts receivable activity.
- Outcome 4 - Proactively research and strive to stay current with trends and future challenges
    - Goal 1: Use existing re-certification and other professional training to make all employees aware of trends and challenges.
        - Measure: Record recertification classes attended during period.

- Goal 2: Work with chemical representatives to conduct new product research and obtain results of other organization research.
    - Measure: Record application of test plots.
- Goal 3: Use the Ada County Weed Control Action Plan for the Prevention, Eradication and Management of Noxious and Other Undesirable Weeds (Comprehensive Plan) as a research and training tool for Weed employees.
    - Measure: Ensure all employees are familiar with the Action Plan.
- Goal 4: Use public education programs to solicit the assistance of Ada County residents in providing information on weed trends and new arrivals
    - Measure: Record names of residents who attend public education classes.
- Goal 5: Use Internet, university, Extension Service and both state and federal resources to expand research tools.
    - Measure: Record sites visited for research.

- Outcome 5 - Educate landowners to utilize Integrated Pest Management practices to control weeds
    - Goal 1: Assist landowners in controlling noxious weeds.
        - Measure: Record number of site visits for consultations.
    - Goal 2: Empower WPM workers in other areas (pest, mosquito abatement and administration) to gather referrals and distribute information on noxious weeds, including employees providing a distinct service to taxpayers.
        - Measure: Record work orders originated by other department members.
    - Goal 3: Using State of Idaho and Ada County resources provide television, radio and print information for public service announcements on noxious weeds and their control.
        - Measure: Record the number of announcements released to the public.
    - Goal 4: Utilize the Ada County and WPM websites to disseminate noxious weed information
        - Measure: Count the number of hits on the web site
    - Goal 5: Provide public presentations on Ada County noxious weeds to local private, public and non-profit organizations.
        - Measure: Record the number of speaking engagements.
    - Goal 6: Establish a voicemail information system at WPM to provide control and identification information to callers.
        - Measure: Record the number of contacts to the voice mail identification system.
    - Goal 7: Distribute information to persons and organizations outside the County (other Idaho counties, other states and federal offices).
        - Measure: Tabulate the number of times information is distributed to other organizations.
    - Goal 8: Establish a customer service support function in areas such as re-calibration of sprayers for non-Ada County entities
        - Measure: Tabulate how many requests for assistance are received each year.
    - Goal 9: Offer pesticide container collection and disposal services at the WPM offices to interested private Ada County citizens.
        - Measure: Tabulate the number of people and containers that use the service per year.
- Outcome 6 - Using Integrated Pest Management (IPM), assist private and public landowners with their controlling of noxious weeds
    - Goal 1: In addition to information provided through the education mission, meet one-on-one with interested landowners in a consulting capacity.
        - Measure: Tabulate the number of visits to consult on site.
    - Goal 2: Provide techniques, ideas and lessons learned to landowners requesting assistance with noxious weeds.
        - Measure: Tabulate the number of visits to consult on site.
    - Goal 3: Use continual IPM practices to end weed recurrence.
        - Measure: Tabulate applications where no herbicides are used.
- Outcome 7 - Facilitate professional staff development
    - Goal 1: Recertify employees on new and existing chemical products, equipment, and safety matters as required
        - Measure: Ensure all employees have 15 recertification credits every two years through various product and safety seminars.
    - Goal 2: Ensure a licensed and certified operator accompanies each control team into the field.
        - Measure: Ensure all personnel are licensed in each departments areas of influence.

- Goal 3: Use discussion and small group instruction to ensure all team members have knowledge of proper and safe operations.
    - Measure: Record in-house and attended training seminars.
- Goal 4: Cross-train all WPM employees so that they are capable of supporting noxious weed control efforts if needed.
    - Measure: Record weed control seminars that are attended by Pest and Mosquito personnel.
- Goal 5: Train employees on handheld communication/GPS devices, other communication tools, computer hardware, the crop data management system (CDMS) and other computer programs required to support noxious weed control.
    - Measure: Record in-house training presented by GIS/GPS personnel.
- Goal 6: Train employees on vehicle and equipment maintenance on an annual basis, prior to beginning noxious weed control operations.
    - Measure: Record maintenance performed by personnel in vehicle ledger.
- Goal 7: Track technological changes and improvements in the field and introduce those that best support organizational improvement.
- Measure: Continue to incorporate technological improvements as they become functional to the plan.

Pest Control Division Level Missions, Objectives and Goals.

Mission

The mission of Ada County Pest Control is to assist landowners in controlling pocket gophers and yellow-bellied marmots (rock chucks) within the Pest Control District. The Strategic Priorities are: To provide public safety, security and health services and to provide excellent public services.

Objectives And Goals

- Outcome 1 - Comply with all applicable federal, state and local laws.
    - Goal 1: Ensure employees are familiar with the content and impact of federal, state and local laws, especially those regarding pests.
        - Measure: Review all labels and MSDS sheets for products being used for Federal Regulations.
    - Goal 2: Annually meet with the Ada County Prosecuting Attorney's Office to review changes in federal, state and local laws, if possible prior to the pest control season.
        - Measure: Review Legal request in the SRV system.
- Outcome 2 - Respond to requests from Pest District residents regarding control of pocket gophers and rock chucks
    - Goals 1: Collect fees from public or religious organization landowners for pest control services, as they are not in the Pest District
        - Measure: Review billing system to insure compliance with non-district entities requesting the service.
    - Goal 2: Train crew leaders in legal, operational, safety, and related areas, to include traps, vehicles, equipment, chemicals, canal district rules and regulations, and customer service.
        - Measure: Record in-house training at the start of each season.
    - Goal 3: Empower crew leaders to train their temporary, part-time employees prior to beginning pest control operations.
        - Measure: Record the train the trainer class attendance for crew leaders.
    - Goal 4: Provide a public education service to Pest District residents, including actions to take and recognition of both rock chucks and pocket gophers, using the Ada County and WPM websites, public seminars and presentations, pamphlets, and public service announcements Establish a group e-mail process so neighborhoods, homeowner associations, and other key groups can be contacted in a timely manner (work with Ada County PIO on this goal)
        - Measure: Track data for Pest Control customers and analyze usage to see if this mission should be continued or if other entities (municipalities, homeowner associations) should be brought under coverage
    - Analyze expansion of pest control coverage, specifically voles and badgers. Mail paper surveys to customers selected at random requesting feedback.
        - Measure: Review surveys to determine a need for the service.
- Outcome 3 - Facilitate professional staff development.
    - Goals: Ensure a licensed and certified operator accompanies each pest control team into the field
        - Measure: License at least 2 personnel on each pest crew.
    - Goal 2: Recertify employees on, new and existing chemical products, equipment, and safety matters as required.
        - Measure: Have in-house training on all products, applications and safety.
    - Goal 3.Use discussion and small group instruction to ensure all team members have knowledge of proper and safe operations.
        - Measure: Conduct in-house training
        - Measure: Cross-train all WPM employees so that they are capable of supporting pest control efforts if needed
        - Measure: Train employees on handheld communication/GPS devices, other communication tools, computer hardware, and other computer programs required to support pest control
        - Measure: Train employees on vehicle and equipment maintenance on an annual basis, prior to beginning pest control operations
    - Track technological changes and improvements in the field and introduce those that best support organizational improvement.

- Measure: Continue to incorporate technological improvements as they become functional to the plan.

Mosquito Abatement Division Level Missions, Outcomes, Goals, and Measures.

Mission

The Mission of the Ada County Mosquito Abatement Field Operations Division is: To control mosquitoes that are both a nuisance and a potential health threat to Ada County residents.

Outcomes, Goals, and Measures

- Outcome 1: Monitor mosquito populations in Ada County for WNv and other health concerns.
    - Goal 1: Quantify Historic data
        - Measure: Update data weekly to maintain an ongoing review of the program's progress in the present period.
        - Measure: Monitor ongoing climatic conditions and compare to historic data to project possible outbreaks of health problems.
    - Goal 2: Field validate sites
        - Measure: Compare collection results to customer calls and field tech reports on mosquito numbers observed to validate trap location and validity.
    - Goal 3: Conduct surveillance program
        - Measure: Tabulate data from trapping activities to optimize the abatement program.
        - Measure: Utilize collection data to establish areas for ULV applications to control mosquitoes.
- Outcome 2: To use ecologically friendly methods to control mosquito populations at the larval stage
    - Goal 1: Increase the number of known breeding sites
        - Measure: Increase the number of known sites throughout the district by 25 to 50% by walking thru all areas previously not surveyed.
- Outcome 3: Use ULV applications of pesticide to control mosquito populations at the adult stage
    - Goal 1:Control adult mosquito populations
        - Measure: Complete all adulticide work orders on a timely basis.
        - Measure: Repeat surveillance trapping after ULV applications to evaluate effectiveness.
- Outcome 4: To reduce the habitat that fosters mosquito larva growth and development.
    - Goal 1: Eliminate all possible breeding sites thru physical methods
        - Measure: Reduce, by 10 to 15%, the number of breeding sites with improve drainage and through public education to eliminate overwatering in landscaped and roadside areas.
    - Goal 2: Establish procedures to control mosquito larva in flood irrigated pastures and other large areas to better control mosquitoes produced in those habitats.
        - Measure: Monitor data collected from surveillance in these areas to gage efficiency of these treatments.

Action Plan – Administrative Division

Introduction

The Administrative Division of the Ada County Weed, Pest, and Mosquito (WPM) Abatement Department serves to coordinate resources, information, and accounting between all three independently funded districts. This plan documents the existing structure of the Administrative Division and provides a focused vision for implementation of new programs and adaptation to the growth of existing programs.

Administration Management

Current Status

Since initialization in 2008, the Administrative Operations Manager has been focusing on getting to know the details of how different people in the administrative realm function and what duties they perform. After an orientation period, a proposal to restructure the administration area and shift duties was received, accepted, and put into place in 2009. This shift dramatically changed the structure and responsibilities of the administrative group in the areas of finance and reception, and will serve to streamline process in the coming years.

Once the administrative structure plan was created, the role of the Administrative Manager shifted to program quantification, qualification, and reporting. Focus areas were isolated where technological or tangible resources were not meeting the needs of the user base. New reports, software functionality, and streamlined business practices were put into place in the form of tangible products, Policy and Procedure, and request for new functionality (SRV requests to IT).

Future Plan

With many of these changes now in place, the role of the Administrative Manager will shift once again, and focus more strongly on projecting to the future along with managing daily operations. Revision and Change Management of the Strategic Plan, Budget, and Action Plans will be coordinated and fused together at the administrative level. Program expansion and modification will be projected, including changes in equipment and staffing needs.

- Implement Document, and Validate Fuel Station inventory and billing processes.
    - Timeline to production: Spring, 2010.
- Request funding for a full time (A Budget) Secretary I/II for FY-2010/2011.
    - Timeline to production: Spring, 2010.
- Request funding for a part time (B Budget) Receptionist for FY 2010/2011
    - Timeline to production: Spring, 2010.
- Evaluate Time and Attendance records to determine potential shifts in duties that may increase efficiency in the Department
    - Timeline to production: Spring, 2010.
- Upgrade Server for increased storage, network performance, and processing capacity in the context of GIS Data Transfers
    - Timeline to production: Fall, 2010.
- Initiate or Participate in educational and outreach events as possible.
    - Timeline to production: Not Defined.

Reception

Current Status

The Secretary position is responsible for fielding most of the phone calls, mail, and walk in traffic at Ada County WPM. Additionally, this position manages the department work order database, and handles phone calls from field crews with questions about their jobs. In the summer months, this can be a very busy position as our call volume becomes very high (A full time Receptionist will be hired in the summer to help handle the burden). In the winter, the duties of the position lessen, but this time of reduced client interaction is capitalized on by other administrative tasks that support the planning activities of field and administrative personnel.

In 2009, we implemented a call management system that ties work orders back to the phone call that generated them. This system also quantifies formally how many phone calls we receive and allows for very useful tracking of client statistics. While the job duties vary greatly with the seasons, the Secretary position is very busy year round. Currently, we do not have a formal A Budget position for a Secretary. In Fiscal Year 2010-11, we will be requesting this position be funded as a full time Ada County Employee.

Future Plan

In 2010, the duties at the reception position will not deviate significantly from historical usage. We have implemented a red flag policy, which is more completely described in the accounting section, and this will affect the way that people answering telephones watch for and capture information about clients.

Accounting

Current Status

The Accounts Clerk II manages incoming payments that totaling more than $600,000 per year, while the Accounts Clerk I manages outgoing payments totaling more than $1.5 Million per year. Currently, client bills are generated automatically by applicators using mobile computers equipped with ArcPad. When applicators return to the office at the end of the day and download their data, client billing information is sent up to a temporary holding space where it will remain until it has been approved for billing. Once the Weed Control Field Operations Manager and the Accounts Clerk II have both approved any pending client bills, it will be transferred into our production database where it will be considered a collectable account.

Every Monday, an automated process prints an invoice for all clients who had service the previous week. This ensures that every client who has a service for cost will receive a bill no more than ten (10) days from the date of application. The first Monday of every month, an automated process prints an invoice for every client with a collectable balance. This ensures that every client receives a reminder of their outstanding balance every 30 days until the account is paid in full.

Future Plan

In late 2009, we implemented a Red Flag policy which identifies specific target areas that we need to watch for that will lessen the possibility of fraudulent use of our client accounts. Our accounting staff has been briefed on this policy and will be the primary eyes and ears for things that may be amiss. Also in 2010 we made some significant upgrades to our internal accounting program. This should free up more time for our accounting staff to keep watch on accounts receivable and implement liens and tax roll payments as necessary. Finally, we will be adding two new programs in 2010, a fuel station and a citation method for noxious weeds. Both of these programs will have an accounting component, and our staff will be working through the summer to implement these in their workflow.

Geographic Information Systems

Current Status – Implementation / Data Collection

Ada County WPM supports the users described in Table 1. Field applications are dominated customized solutions built in ArcPad software, which may or may not integrate real time GPS data. Office applications are dominated by ArcGIS Desktop or ArcGIS Server Web Applications.

Department	Field Use			Office Use		
	2009 (actual)	2010 (expected)	20ll (projected)	2009 (actual)	2010 (expected)	2011 (projected)
Mosquito Abatement	**13**	**14**	**14**	**4**	**4**	**4**
Larvacide	9	10	10	2	2	2
Adulticide	3	3	3	1	1	1
Surveillance	1	1	1	1	1	1
Weed Control	**5**	**8**	**9**	**2**	**4**	**5**
Pest Control	**5**	**5**	**5**	**1**	**1**	**1**
Administrative	**--**	**--**	**--**	**4**	**4**	**4**
Total	**23**	**27**	**28**	**10**	**12**	**13**

Summary of current and projected users of GIS.

Currently, Geographic Vector Data is being collected for any area in Ada County that is treated with any type of pesticide application that has a work order associated with it. Where chemical application is managed using a chemical rate controller, geographic data is collected coincident with application.

Current Status - Reporting

Using GIS, reports are generated that are capable of providing a complete legal application record. There reports come in several varieties, as described below.

- Field Application Reports: When using a tablet PC or laptop equipped with the customized Ada County WPM project interface, Digital reports may be generated in the field from data collected (See Appendix 1 for an example). These reports are generated using Microsoft Access, saved to removable media, and digitally signed in Adobe Acrobat by the applicator(s). On download, these reports are archived to a pre-determined location on our network drive for indefinite storage. They are also printed, reviewed, and approved by both the Weed Control Field Operations Manager and the Accounts Clerk II before any account is billed.
- Office Application Reports: Using ArcGIS Software, an interface has been designed that will allow our office administration staff to pull up a report of any application that will display all information required by state law, including a map of the application area, if available (see Appendix 2 for an example). There reports are created on-demand, and can be printed to PDF or physical copy as needed.
- Proximity Reports: Using ArcGIS Software a mosquito abatement larvicide site can be queried for any and all application history (see Appendix 3 for an example). This will provide a single page layout of all activity at a given location (for the current calendar year). More details and a legal report for individual applications can be derived using the Office Application Report described above.

Current Status – Data Storage, Dissemination, and Sharing

Historically, primary GIS storage at WPM has migrated from shape files (2005 and before) to personal geodatabases (2006) to file geodatabases (2007-2008) and finally to SDE (2009 – Current). SDE is the preferred environment in an ideal world, but at WPM we have experienced some limiting factors that have complicated the use of SDE. WPM presumes that most of these issues are temporary in nature and will be resolved by working directly with IT staff and hardware / software upgrades.

- Network bandwidth is prohibitive for the transmission of large (> 1MB) files
- ArcGIS License / SDE connections have been at times instable
- Remote connections to Servers (Hummingbird / GISV) have been difficult to establish when needed
- Authority issues (read/write permissions) have been recurring.
- Software product update schedules are generally not know or not announced
- Long term plan for Ada County GIS Department is not known.

Currently, the only data that is being shared to the public (outside of clients) is the Mosquito Surveillance data. This data is being shared in the context of an ArcGIS Web Server Application. Currently, the only client that has requested geographic data form WPM is ACHD. They have requested that we send them geographic features that represent application areas pertaining to their contract. In the past, this data has been delivered to ACHD in the form of shape files.

Current Status – Interfaces

Ada Count WPM has three different GIS User Interfaces, as described below.

- ArcPad: Used by field crews, a custom ArcPad solution allows for the seamless collection of geographic and tabular data. Data is transferred between field devices (Windows Mobile or laptops) via SD Memory. Users are required to log into the ArcPad interface using a self-managed password. Once they log in, dates, times, user and device identification information and many other attributes are recorded automatically (outside of user control) to document the field activities. Where possible, GPS data is collected co-incident with pesticide chemical application. On return to the office (daily), Applicators are required turn in their cards for download / updates, to ensure that the most current information is held by all staff.
- ArcGIS Desktop: A custom toolbar has been compiled and automatically distributed to client PCs. The toolbar contains an update sniffer, so all PC's will run the most current version of the toolbar at all times. This solution is used by office staff from management to reception. Receptionists use the solution to answer client inquiries about activities in a particular region or at a particular address. Team leads use the solution to plan or review applications. Managers use the solution to summarize work or get status updates. This solution also manages data installs and downloads to mobile cards.
- ArcGIS Server: A basic ArcGIS Server application has been constructed and put into use that begins to replace the functionality of the ArcGIS Desktop solution for certain applications. This in-house solution will allow the display and query of geographic features, and the printing of maps, and is actively being used by Team Leads

and Reception staff. A separate public application has been constructed that allows for the display of West Nile Virus Surveillance Activities.

Future Plan for GIS Integration

GIS is used daily by many users at WPM (See Table 1). As such, a great deal of the duties are standard data maintenance, new project integration, and processing of special requests. The following areas are of particular interest, or plan, to explore or integrate into the GIS business flow at WPM in the time period defined.

- Weed Mapping and Inventory: Recently, we have had a great deal of interest in making a more functional and standard method to perform weed inventory and weed site mapping procedures. During the winter of 2009-2010, we will be reviewing this functionality and the underlying data. We will be making some fundamental changes to the way that we collect and store weed data that should both simplify the product and also improve the quality of the data that is being collected.
    - Timeline to production: Spring, 2010.
- Scheduled Task Automation: Using visual studio with integrated references to ArcObjects, Standalone executable files are being developed that should have the potential to replace some of our manual scheduled update processes. This will relieve the need to perform certain refresh operations every day, and should speed the install speed and accuracy of mobile project cards.
    - Timeline to production: Spring, 2010.
- Mobile Inspections: Certain types of work orders at WPM have common themes and needs, even though they cross departmental lines. Using ArcPad technology, a new inspection project will be created that will allow for the simplification of inspections as work orders, and expand the functionality of the existing program.
    - Timeline to production: Spring, 2010.
- Wireless Data Transfers: Using LEAP and WPA2 authentication, we are exploring the ability to connect directly to intranet server resources using mobile computers (Toughbooks or Handhelds). If successful, this could potentially replace the need to use removable media (such as SD cards) or cables to synchronize data on devices.
    - Timeline to production: Not Defined.
- ArcGIS Mobile: Historic versions of ArcGIS mobile have not been feasible implementations for production at WPM. However, at Version 9.3, we are exploring this technology as an alternative to ArcPad in certain situations.
    - Timeline to production: Not Defined.
- ArcGIS Server: Initial applications using ArcGIS Server have demonstrated potential for further integration. Exploration of potential expansion of this technology is under review, and applications will be developed as needed or as time permits.
    - Timeline to production: Not Defined

Facilities, Safety, and Inventory

Current Status

Currently, the Facility and Inventory Specialist is in charge of receiving and distributing all chemical products to applicators as needed. The position also is responsible for facility safety policy development and maintenance. All of these areas are under review for procedure, and should formalize over the course of the next year.

Future Plan

- Develop, implement and document an inventory validation, supply and ordering procedure for the new fueling station
    - Timeline to production: Spring, 2010
- Implement, document, instruct on, and enforce new department safety policy
    - Timeline to production: Spring, 2010
- Integrate new chemical inventory system delivered from IT into daily practice
    - Timeline to production: Spring, 2010
- Develop and integrate a facility needs checklist that is accessible to all staff. Facilities specialist will take a first cut at the list to prioritize tasks and determine which ones need referred to Operations. Operations tasks will be referred to supervisor for SRV Creation as appropriate.
    - Timeline to production: Summer, 2010
- Develop and integrate new reports for product distribution based off of job assignments (with recommendations), completions, and previous chemical allocations.
    - Timeline to production: Summer, 2010

- Develop and integrate techniques to compare actual product usage with ideal product usage
    - Timeline to production: Fall, 2010

Action Plan – Weed Control Field Operations Division

Introduction

All noxious weeds are of "foreign" origin. These weeds were introduced into the County through various means including, but are not limited to, contaminated materials such as seed, feed, construction materials, packing material, agricultural, horticultural seeds and plantings.

All noxious weeds started out as small insignificant or inconspicuous infestations. Lack of awareness, concern, or knowledge of the consequences contributed to the establishment and spread of noxious weeds on both private and public lands. Once noxious weeds are introduced, the majority are able to adapt extremely well to Idaho's environment and, without natural enemies (diseases and/or insects), proliferate and out-compete the native or desirable vegetation. A systematic plan must be implemented to control noxious weeds. All noxious weeds present in the County are established in various degrees of infestation. While some noxious weeds are widespread other noxious weeds may infest relatively small areas. The history of noxious weed control in Ada County has shown, that if left untreated, small infestations may quickly turn into large, hard to manage infestations requiring large sums of money, time and effort. This noxious weed action plan is developed and implemented on the concept that priorities will be assigned to specific noxious weeds. Priorities will be assigned by the categories defined in the Department of Agriculture rules and regulations section 02.06.22 – Noxious Weed Rules, Section 100 Noxious Weeds – Designations. Evaluative criteria will be assigned to each category and then applied to each noxious weed species being considered for placement within the appropriate category. Criteria such as economic and technical feasibility, environmental considerations and time availability will be applied to determine total commitment to controlling each weed species.

Each prioritized weed category will have a policy associated with it. The policy will contain information on the education, inspection guidelines, enforcement procedures, and control measures for the weeds in the category. The complete noxious weed law is contained in Title 22, Chapter 24 Idaho Code. To prevent unnecessary repetition only the applicable sections of this law are referenced in the policies. An official copy of the noxious weed law can be obtained by contacting the Department of Agriculture or (http://www3.state.id.us/idstat/TOC/22024KTOC.html)

Noxious Weed Action Plan

State Wide EDRR

State listed Early Detection /Rapid Response
Emphasis: Plants in this category must be reported to the Idaho State Department of Agriculture (ISDA) within 10 days after being identified at the University of Idaho or by another qualified authority approved by the ISDA director. Eradication must begin in the same season they are found.

Ada County EDRR

County listed Early Detection /Rapid Response
Emphasis: Plants in this category will have eradication programs designed and implemented upon detection.

State Wide Control

Emphasis: Control to halt the spread of the infestation with the ultimate goal being eradication of individual infestations. Integrated methods of control will be incorporated, including, but not limited to, agreements with extensive landowner participation and monitoring. Potential for eradication is high, but due to the large number of infestations, control must be extended over a period of years.

State Wide Containment

Emphasis: Treatment alternatives ranging from no action to several levels of integrated noxious weed management, including eradication. .

Justification

In 2006, with legislative approval, the Idaho Department of Agriculture expanded the Noxious Weed listings from 36 to 57 weeds. They also incorporated the EDRR (Early Detection/Rapid Response) category. Ada County has the ability under State statute to elevate a weed species to a higher control category. Even though priorities are placed on specific species in this program, the majority of time, effort and money will be spent on those weeds listed as State Wide Containment Weeds, as they constitute the most immediate impact and concerns of the general public.

This Action plan gives Ada County Weed Control the ability to assign the degree of control of each noxious weed species in the county based on the extent and area(s) of the infestation(s) and the ability to perform those control measures within financial and manpower constraints.

This coordinated and integrated noxious weed action plan will give direction and continuity to develop and maintain a systematic approach for controlling noxious weeds on all lands under its jurisdiction in accordance with Title 22, Chapter 24, IDAHO CODE Section 22-2405 (1). It is the intent of Ada County to comply with the Idaho Noxious Weed Law and associated rules and regulations concerning noxious weeds within environmental and technical constraints and management objectives.

The implementation of this program will positively impact Ada County through landowner education and strict enforcement. This will lead to the eradication of small infestations of noxious weeds, eventually allowing more resources to be spent on the larger more established infestations.

Early Detection/Rapid Response (EDRR) Policy

Evaluative Criteria and Methodology:

- Record pathways of weed species from other areas where potential introduction may occur.
- Conduct weed tours, and education and awareness programs to alert county staff, land management agencies and the general public to be on the alert for these weeds.
- Identify appropriate quarantine and exclusion procedures.
- Utilize the University of Idaho's plant identification program for verification of suspected newly introduced weed species.
- Once a new noxious weed is confirmed in the county, reclassify it to an appropriate category utilizing the noxious weed action plan.

Control:

- Control will be education, awareness, identification, to prevent introduction pathways, with recognition and monitoring to close introduction pathways into the county. 22-2405 (1) (d) Once a new infestation of an EDRR weed has been verified, the County will report the infestation to the Department of Agriculture and use any or all integrated pest management strategies available to eradicate the weed during the growing season.

Inspection:

- Weed Complaints will be inspected within five working days of the complaint and processed as any other infestation within the respective category. 22-2405 (6) (a) (e); 22-2406 (2) (a)
- This department's employees will conduct on going inspections of the county for the purposes of identifying EDRR weed infestations and EDRR pathways. 22-2405 (6) (a)
- When a new infestation occurs it will be mapped and logged into a data base for future monitoring and eradication. 22-2405 (1) (b); 22-2406 (6) (b)

Education:

- Departmental training will be provided for each EDRR species. By strengthening our ability to identify potential EDRR invaders at an early stage of infestation eradication is more likely to occur. 22-2405 (1) (d)
- A list of EDRR weeds will be published in the paper in the general noxious weed notice between March 1st and April 30th. 22-2405 (2)

Violoation Fee:

- A citation valued at $75.00 may be issued to landowners who are not in compliance with this policy.

List of EDRR Weeds:

Common Name	Scientific Name	Common Name	Scientific Name
Black henbane	*Hyoscyamus niger*	Oxeye daisy	*Chrysanthemum leucanthemum*
Bohemian knotweed	*Polygonum bohemicum*	Perennial sowthistle	*Sonchus arvensis*
Buffalobur	*Solanum rostratum*	Plumeless thistle	*Cardduus acanthoides*
Brazilian elodea	*Egeria densa P*	Policemans helmet	*Impatiens glandulifera*
Common crupina	*Crupina vulgaris*	Silver-leaf nightshade	*Solanum Cav elaeagnifolium*
Dyers woad	*Isatis tinctoria*	Skeletonleaf bursage	*Ambrosia tomentosa Nutt.*
Giant hogweed	*Heracleum mantegazzianum*	Small bugloss	*Anchusa arvenis*
Giant knotweed	*Polygonum sachalinesnse*	Squarrose knapweed	*Centauria squarrosa*
Hydrilla	*Hydrilla verticillata*	Syrian bean caper	*Zygophyllum fabago*
Johnsongrass	*Sorghum halepense*	Tall hawkweed	*Hieracium piloselloides*
Matgrass	*Nardus stricta*	Tansy ragwort	*Senecio jacobaea*
Mediterranean sage	*Salvia aethiopis*	Toothed spurge	*Euphorbia dentate*
Milium	*Milium vernale*	Vipers bugloss	*Echium vulgare*
Musk thistle	*Carduus nutans*	Water hyacinth	*Eichhornia crassipes*
Meadow knapweed	*Centaurea pratensis*	Yellow devil hawkweed	*Hieracium pratense*
Orange hawkweed	*Hieracium aurantiacum*	Yellow hawkweed	*Hieracium caespitosum*

State Wide Control Policy

Evaluative Criteria and Methodology:

- Target species confirmed as infesting Ada County.
- Identify extent of infestation(s) and boundaries through GIS mapping of the location.
- Determine accessibility of infestation(s).
- Determine feasibility of eradication, monitoring and treatment capabilities.
- Identify and determine public and private landowner participation.
- Determine the ramifications, whether the addition of the target species will move an existing noxious weed in category II to category III in terms of economic and physical resource allocations.

Control:

- Weed containment will be with the goal of infestation eradication leading to county-wide eradication. Eradication as used in this policy means the complete elimination of all above-ground plant growth of a target noxious weed species for a period of two (2) years.

Inspection:

- Weed Complaints will be inspected within five working days of the complaint and processed as any other infestation within the respective category. 22-2405 (6) (a) (e); 22-2406 (2) (a)
- The employees from this department will conduct on going inspections of the county for the purposes of identifying new weed infestations in this category. 22-2405 (6) (a)
- When a new infestation occurs it will be mapped and logged into a data base for future reference and inspections. 22-2405 (6) (b)
- Each landowner in our data base, for a weed species in this category, will receive an annual inspection for compliance. 22-2406 (2) (a)
- If the annual inspection reveals an untreated infestation notification will be sent to the landowner requesting a time for personal consultation to outline the procedures for control and set a time for a follow up inspection to confirm control measures were completed. 22-2406 (2) (b)

Education:

- News articles giving facts for Ada County will be published and placed on the website as often as possible. 22-2405 (d)
- Departmental training will be provided for each species in this category, to strengthen this department's ability to identify new invaders at an early degree of infestation. 22-2405 (d)
- Personal contact and consultation will be made for each landowner with an infestation in this category. 22-2405 (6) (d); 22-2406 (2) (b)
- Enforcement Policy:
- If the follow-up inspection shows no control action then civil and/or criminal penalties will be assessed according to Title 22, Chapter 24, Idaho Code Sections 22-2405 (3), (4), (6) (c) (e); 22-2406 (1) (b) (c) (d); and 22-2409 (1), (2)

Violoation Fee:

- A citation valued at $75.00 may be issued to landowners who are not in compliance with this policy.

State Wide Control Weeds

Common Name	Scientific Name	Common Name	Scientific Name
Dalmatian toadflax	*Linaria genistifolia ssp. Dalmatica*	Leafy spurge	*Euphorbia esula*
Diffuse knapweed	*Centaurea diffusa*	Parrotfeather milfoil	*Myriphvlum aquaticum*
Eurasian watermilfoil	*Myriophyllum spicatum*	Russian knapweed	*Acroptilon repens*
Hoary alyssum	*Berteroa incana*	Scotch broom	*Cytisus scoparius*
Houndstongue	*Cynoglossum officinale*	Yellow starthistle	*Centaurea solstitialis L.*
Japanese knotweed	*Polygonum cuspidatum*	Yellow toadflax	*Linaria vulgaris*
Jointed goatgrass	*Argilop scylindrica*		

State Wide Containment Policy

Evaluative Criteria and Methodology:

- Determine that under existing programs the target species cannot be eradicated in two years due to the large number of infestations.
- Determine extent of infestations.
- Determine landowner participation needed to maintain management goals.
- Determine method best suited to monitor known sites and compliance.

Control Policy:

- Control will be county-wide to reduce the vigor and stand of the infestation with the ultimate goal being eradication.
- Integrated methods of control will be incorporated, including, but not limited to, agreements with and extensive landowner participation and monitoring. 22-2406 (i)

Inspection Policy:

- Weed Complaints will be inspected within five working days of the complaint and processed as any other infestation within the respective category. 22-2405 (6) (a) (e); 22-2406 (2) (a)
- Employees from this department will conduct on going inspections of the county for the purposes of identifying new weed infestations in this category. 22-2405 (6) (a)
- Infestations will be mapped and logged into a data base for future reference and inspections. 22-2406 (6) (b)
- Each landowner in our data base, for a weed species in this category, will receive an annual inspection for compliance with Ada County program policies. 22-2406 (2) (a)
- If the annual inspection reveals an untreated infestation, notification will be sent to the landowner outlining the procedures for control. 22-2406 (2) (b)

Education Policy:

- News articles giving facts for Ada County will be published and placed on our web site as often as possible.
- Each landowner in our data base, for a weed species in this category, will be mailed information about the weed species in this category, and phone numbers to this office to call for assistance. 22-2405 (d)
- Enforcement Policy:
- If the follow-up inspection shows no control action then civil and/or criminal penalties will be assessed according to Title 22, Chapter 24, Idaho Code. 22-2405 (3),(4),(6) (c); 22-2406 (1) (b) (c) (d); 22-2409 (1), (2)

Violoation Fee:

- A citation valued at $50.00 may be issued to landowners who are not in compliance with this policy.

State Wide Containment Weeds

Common Name	Scientific Name	Common Name	Scientific Name
Canada thistle	*Cirsium arvense*	Rush skeleton weed	*Condrilla juncea*
Field bindweed	*Convolvulus arvensis*	Saltcedar	*Tamarix*
Perennial pepperweed	*Lepidium latifolium*	Scotch thistle	*Onopordum acanthium*
Poison hemlock	*Conium maculatum*	Spotted knapweed	*Centaurea maculosa*
Puncturevine	*Tribulus terrestrius*	White bryony	*Bryonia alba*
Purple Loosestrife	*Lythrum salicaria*	Hoary cress	*Cardaria draba*

Action Plan – Pest Control Field Operations Division

Introduction

Idaho Code Title 25 Chapter 26 authorizes the formation of an Agricultural Pest Extermination District and requires petitions to be signed by at least fifty (50) land owners in precincts containing over one hundred (100) agriculture landowners. In 1968, a petition declaring pocket gophers (*Thomomys spp.*), and Yellow-bellied Marmots (*Marmota flaviventris*) as agricultural pests requiring control was circulated throughout the district. Sufficient signatures were collected, and a petition hearing was held on December 18, 1968. When no protests to the creation of the district were voiced, the original Ada County Pest Control District was formed December 19, 1968. The original district boundaries included all of Ada County, with the exception of the incorporated municipalities (i.e., Boise, Meridian, Kuna, and Garden City). In 1974, lands inside the city of Eagle were exempted, and the city of Star became exempt upon reincorporating on December 12, 1998. As the cities within Ada County have grown and annexed land, the district's acreage has reduced.

Statement of Purpose

Ada County Pest Control Action Plan was designed to effectively control Pocket Gophers and Yellow-bellied Marmots. These destructive pests create infrastructure problems primarily for irrigation systems. The action plan helps landowners understand the districts goals and objectives and demonstrates how tax funds are managed within the program.

Pest Overview: Pocket Gopher

Description

Photo courtesy of NPS Photo

Pocket gophers (*Thomomys spp.*) are burrowing rodents, 6 to 10 inches long, and have fur-lined external pouches on each side of their jaws, from which they get their name. Pouches are used to carry food and nesting materials. They are equipped with powerful front quarters and claws for tunneling. Gopher's lips close behind their four large incisor teeth, allowing the teeth to be used for digging and gnawing without getting dirt in their mouth.

Gophers have small ears, eyes and short fine fur. With their hearing and sight severely limited, they have developed a high sense of touch. The gopher's whiskers help navigating in the dark and finding food in its burrow.

Gopher activity can be year around. Evidence is indicated by fresh mounds of dirt on the surface. Unlike the mole, which leaves a raised track from its shallow tunnel, gophers tunnel 12 to 18 inches below ground level, surfacing occasionally to deposit loose dirt. Deposits are typically horseshoe shaped with a dirt plug.

Behavior

Gophers live below the ground in burrows, but may be seen pushing dirt up, feeding by the edge of the burrow opening, or moving over the ground to a new area. Burrow systems cover 200 to 2,000 square feet.
Pocket gophers are solitary animals, except during the mating season. They reach sexual maturity at about one year and live a few years. Females produce from one to three litters, of about five (5) pups per year. When pups are old enough, she will expel them from her runway system.

Pocket gophers are herbivorous, feeding on a wide variety of vegetation. They use their sense of smell to locate food. Their food supply consists of roots and fleshy plant parts encountered while digging. When they venture above ground to feed, they stay within a short distance of the tunnel opening. These holes have no plugs and vegetation will be grazed in a circle around the tunnel entrance. Gophers may construct several mounds a day. Mound building is most prolific when the soil is moist, such as in irrigated areas. Spring and fall moisture aids mound building in non-irrigated areas.

Pest Overview: Rock Chuck

Description

By comparison, Yellow-bellied Marmots (*Marmota flaviventris*), also known as rock chucks, are the largest of the ground squirrels. They weigh up to eleven pounds and grow to over two feet long. They are brown to gray with white on their chins and, as the name implies, yellow on their stomachs. Rock chuck's fur is long and coarse, making them look

even larger. The rock chuck burrows in rocky areas to a depth of three feet. They burrow fifteen to twenty feet deep during the hibernation period. Hibernation occurs as early as August.

Yellow-bellied Marmots belong to the Mammalian order *Rodentia*, in the squirrel family, which also includes the woodchuck, prairie dog, and chipmunk species. The generic name "marmot" is derived from the Romansch word "murmont," which means "mountain mouse." The specific name, *flaviventris*, means "yellow belly" in Latin, referring to the yellow hue on the animals' underside.

Behavior

Unlike gophers, rock chucks leave their tunnels open and spend time above ground eating and sunning. They live in elevations up to 13,000 feet throughout the western United States and Canada. They construct burrows in fields near their food sources. Rock chucks eat herbaceous plants, legumes (alfalfa), grains and insects.
Males have harems of two to four females. They are aggressively territorial, and defend their harem. Females raise their young jointly within the harem.

Photo courtesy of PDPhoto.org

Breeding occurs in spring shortly after animals come out of hibernation, usually in April. After a 30-day gestation period, females give birth to a litter of three to seven offspring. The young remain with the harem through the next summer, generally hibernating with their mother. Harem males chase off male offspring shortly after awakening from hibernation, but allow females to remain. Sexual maturity is reached in their second year, with breeding during their third year. Rock chuck's lifespan can extend thirteen to fifteen years. To survive hibernation, animals build up a high body fat during the summer months.

Personnel

Ada County Pest Control employees are seasonal. Each spring workers are contacted to return for the up coming pest season. Annually, all personnel are required to complete department safety and operational training prior to going to the field. The department has developed a training class for product knowledge and safety. This class covers personal protective equipment, label knowledge and application and trapping methods. This training is to protect the applicator, public, and environment.

Work Order Management

Ada County Pest Control employs four crews during the season. Each crew has a licensed Crew Leader, plus additional pesticide applicators when needed. The Crew Leader is responsible for keeping the crew's work orders organized and ensuring making sure clients are served effectively. One individual acts as the Pest Team Leader, with responsibilities for coordinating and supervising Crew Leaders. The Team Leader ensures departmental goals are met and that crews have the necessary resources to be effective. Weekly, the Pest Team Leader works where he is needed. He works with all crews to make sure field work is completed.

Ada County Pest Control District is divided into three large crews. All gopher work order requests, five acres or larger, are assigned to a large crew. Oldest work orders have first priority, but additional work orders in the vicinity are completed concurrently to optimize travel time. A fourth crew of two men handles small jobs where a large crew would not be cost effective. This crew is specifically trained to handle products for rock chuck control. Once a district patron requests services from the Pest Control Department, the Crew Leader assigned to the work order, decides the best method for that particular use.

Control Methods for Pocket Gophers

Baiting

Underground baiting is the primary measure used to control pocket gophers. The District uses strychnine on grain and zinc phosphide pellets as bait. Baiting is the most cost-effective method of control. Strychnine bait is 0.5 percent active ingredient. More than one feeding for gophers to ingest a lethal dose is not uncommon. Bait may be active for thirty to sixty days ,and if a second gopher inhabits the runway system, the bait could still be viable. Zinc phosphide pellets are 2.0 percent active ingredient. Pest Control uses zinc phosphide around sensitive areas. It is short lived and moisture activated. One feeding is sufficient for control. If gophers consume a non-lethal dose of bait, they may become "bait shy" and alternative control methods are employed.

To bait pocket gophers, the product must be placed in the main runway, twelve to eighteen inches below the ground, where animals find and eat it. Metal probes are used to bore into the main runway system near exit mounds. Once the runway is found, applicators pour the recommended amount of bait into the hole. After the pesticide application, probe holes are covered with a rock or sod, and the applicator moves to the next mound. Once the property has been completely worked, the Crew Leader enters the required data on a computerized work order and moves to the next request for service.

Gas Cartridges

If there is sufficient moisture in the soil, gas cartridges are the first alternate choice of control. When the crew opens the tunnel system of a new mound, a gas cartridge is lit and placed in the main runway. The tunnel is resealed, and the smoke fills the tunnel system. This method is more time consuming than baiting.

Trapping

Trapping is the most labor-intensive control method. It can be very effective in small areas and as a final effort following a baiting program to remove the remaining animals. A three-man crew generally requires three hours to set seventy five to one hundred traps.
Crew members open the plug of a fresh mound and insert a trap into the system. Fresh mounds are usually plugged a few inches. Pest Control traps have a small cable attached to anchor them to the ground outside the tunnel with a stake. Small engineering-style flags are placed near the stake to make them visible for recovery. The opening is typically covered with surrounding vegetation. The next day, traps are recovered and the crew records the number of catches.

Photo courtesy of Ada County Pest Control

Control Methods for Rock Chucks

Baiting

The control method used for rock chucks is baiting. Two-man crews are trained in the use zinc phosphide concentrate. First, the rock chucks burrow is located. Carrots coated in vegetable oil are placed in a traveled pathway for pre-baiting. Rock chucks consume the carrots and become accustomed to them. On later visits, applicators coat the carrots with zinc phosphide. Applicators return to the site and restock the bait until it is no longer being consumed. Applicators collect any remaining bait for disposal.

Action Plan – Mosquito Abatement Field Operations

Introduction

Mosquito transmitted diseases have existed in the Americas since long before European settlement. Eastern Equine Encephalitis, Western Equine Encephalitis, and St. Louis Equine Encephalitis viruses are examples of such long-term threats. With the coming of the Europeans to the New World, additional diseases, such as malaria, dengue and yellow fever were added to the mix of vector-born diseases. Most people today are unaware that malaria extended throughout the United States and into southern Canada in the 1800's. Before the widespread use of motor vehicles, Equine Encephalitis viruses caused major epidemics in the horse population that resulted in substantial economic losses.

In recent years, a variety of new and exotic disease problems have been encountered. Vectors, such as mosquitoes, transmit many zoonoses, such as West Nile virus (WNv). WNv spread rapidly after its introduction to the United States, being first confirmed on the east coast in 1999 and distributing across the country to the west coast in only 5 years. Given increasing trends in globalization, travel and commerce, it is likely that other exotic diseases will be transported to and become established in the United States in the future.

The cost of vector-born disease prevention is normally less than the cost of control after an epidemic begins. Not only is emergency vector control expensive, but there is also the added cost to treat disease cases that might otherwise have been prevented. The average cost per patient hospitalized with WNv infection in Louisiana in 2002 was $51,826. Ada County had three cases of WNv paid for through indigent services in 2006, which cost tax payers over $150,000.00. The cost of WNv to the U. S. equine industry may be in the billions of dollars. These numbers fail to address the additional emotional cost to the families of victims of mosquito-transmitted disease, the changed quality of life of the victims and other similar issues. In addition to the impact on human and equine health, these viruses frequently have a major impact on wildlife, including threatened and endangered species. In 2002 alone, it is estimated that more than 2 million birds died from WNv infection in The United States.

The abrupt arrival of West Nile virus in Idaho demonstrates that mosquito control is an important public health function. The challenge that mosquito abatement districts face is to develop and maintain an effective vector control plan.

In Ada County, the original Mosquito Abatement District (MAD) was the Three-Mile Creek District. It was established in 1974 with the mission to control mosquitoes that are both a nuisance and a potential health threat. This first-generation district included 12 square miles between Cloverdale and Cole Roads on the west and east, and Franklin and Columbia Roads on the north and south. Over the next several decades there were numerous district annexations that expanded the boundaries and changed the name. In early 2004, the Ada County Board of County Commissioners agreed to incorporate and operate what was then called the Southwest Ada County Mosquito Abatement District. Today, the Ada County Mosquito Abatement District (ACMAD) includes 406 square miles of Ada County and encapsulates most major residential and urban centers

Worldwide there are approximately 3,000 species and subspecies of mosquitoes. Of these, about 170 are found in North America and 51 in Idaho. These pests affect people's work recreational activities, impact our agricultural economy, and threaten citizens with diseases they may carry. Most of the 51 species of mosquitoes found in Idaho can be classified as *unimportant* in that they may be pests in certain ecological conditions, but are generally uncommon or rare. A few species are classified as *less important* as they may be disease vectors, but are only abundant under certain ecological conditions. Ada County Mosquito Abatement is most interested in species classified as *important,* namely those that are abundant, widely distributed, serious pests or competent disease vectors.

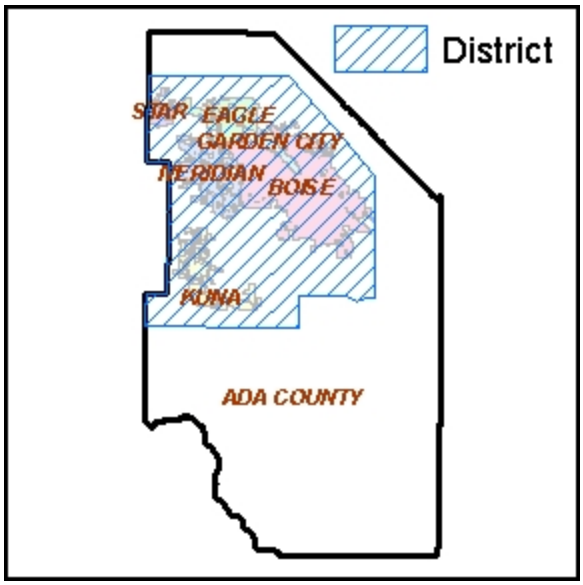


Illustration of the Mosquito Abatement District boundary as of 2010.

The mission of ACMAD is to provide a healthy, mosquito-controlled environment for the citizens of the Mosquito Abatement District. Strategic priorities provide public safety, security and excellent health and public services. To reach this mission and achieve these goals, our agency utilizes an Integrated Pest Management (IPM) approach. IPM is a decision-making process that uses all available pest management strategies (education, cultural l, mechanical, biological, and chemical controls). Utilizing an IPM approach helps determine what combination of control strategies will reduce the mosquito populations to an acceptable level with the least impact to the environment.

- Education is the first and most successful management strategy in IPM. Mosquito control programs need the support

of an informed public. When trained, residents can successfully recognize, treat, or remove potential breeding sites in their neighborhoods. By learning about the different types of mosquitoes, landowners are better prepared to understand the various control strategies and we can work together more effectively. As we complement each other's activities, we maximize the mosquito abatement effort within the district.

- Cultural controls deal with changing a person's habits to reduce or avoid contact with mosquitoes. Examples are wearing long sleeves to avoid being bitten, or taking a walk at a different time when mosquitoes are less active.
- Mechanical controls involve physically changing land or structures to reduce breeding sites. Changing the water in a birdbath, or removing a shallow pond of standing water are examples of mechanical processes that eliminate breeding sites.
- Biological control consists of introductions of natural enemies of mosquitoes that kill the larvae or adults. *Bacillus thuringiensis israelensis*, or *Bti*, is a biological control used to kill mosquito larvae by disrupting their digestive system.
- Chemical controls are generally the last choice for mosquito abatement. Sometimes aerial control is necessary to effectively reduce flying mosquitoes from large geographical areas.

Of the fifty-one mosquito species found in Idaho, thirteen have been identified in Ada County through surveillance activities. These thirteen species are divided into two major types; pond and floodwater mosquitoes. The distinction between these two types of mosquito species is very important because the methods to monitor and control them are different. Likewise, control methods are also different for larval and adult stage mosquitoes.

Mosquito breeding sites are dynamic and in constant change. For example, in wet years more pond sites show up than in dry years. Land use changes can also alter the sites and types of mosquitoes present in an area. An example of this is the development of a subdivision from an agricultural field which may either remove the breeding site or create urban ponds. As such, sites are constantly being re-assessed, and field crews are always on the watch for newly created sites.

Statement of Purpose

The ACMAD Comprehensive Plan provides a framework for the structured implementation of a program to effectively control mosquitoes in Ada County. It also offers the public and other interested agencies and organizations a detailed look at our mosquito abatement strategies. Additionally, elements within this plan will help the department determine goals and objectives, prioritize activities, and isolate program areas that need restructuring. Finally, evaluation of this plan will help assure the appropriate and responsible usage of tax funds to provide an efficient and balanced program.

Activities described in this plan cover routine operating procedures. Idaho Code (Title 39 Chapter 28 Section 39-2808) provides for additional and cumulative remedies above routine procedures to prevent, abate and control the spread of mosquitoes and/or other vectors affecting the health, safety and welfare of Idahoans. Pursuant to Idaho Code (Title 46 Chapter 10), if all efforts by the district have not stopped an event posing a threat to the public, a government agency may initiate cooperative operations with other state or federal agencies by means of an "Emergency Declaration". This declaration gives the district access to additional resources and allows for more extensive efforts to maintain the health, safety, and welfare of our residents.

Life Stage Management Strategies

Larvaciding, or abatement of mosquitoes as larvae in bodies of water, is the first line of defense and is a major emphasis in our program. Larvicides, or the products used to control mosquitoes in the larval stage, may be either biological or chemical in nature, and are intended to either stunt the growth or kill mosquito larvae, thereby preventing their hatching or development into adults. Management of mosquito larvae is handled differently depending on the type of mosquito (pond or floodwater). This is discussed in more detail in the following sections.

Adulticiding, or the abatement of mosquitoes as flying adults, is an important control method in protecting public health, but is used only when conditions are warranted. Adulticiding can be conducted by air but most commonly is a ground based application of insecticide using an Ultra Low Volume (ULV) fogging machine mounted on a small truck. Floodwater Mosquito adults are the major thrust of the adulticiding program. These mosquitoes commonly hatch and mature simultaneously thus producing large numbers of nuisance mosquitoes. Most complaint calls for mosquitoes can be traced to this type of mosquito.

Chemical application occurs near dawn or dusk, when adult mosquitoes are most active and beneficial insects are inactive. Application areas are determined by complaint calls, requests from the larvicide crews during the day, and from surveillance information. In the event of an outbreak of a disease, such as happened in 2006 with West Nile virus, a contingency plan for aerial application of adulticides could be initiated to supplement ground applications.

Management of Larval Stage Pond Mosquitoes

Urban development and construction in Ada County is continuously changing land use removing some of our identified breeding sites and creating new sites. Our staff is regularly watching for new site locations and mapping them. Permanent pond sites are areas that fill and hold water after a rain or irrigation. Generally they permit multiple successive generations. Populations of this type of mosquito increase at a slower rate than the floodwater mosquitoes, resulting in fewer complaints about their biting. Since these sites are permanent to semi-permanent we can routinely monitor, trap, and control species at these sites and determine if WNv is present.

Field crews monitor pond sites in different areas of the county to determine the need for larvicide applications. If dipper samples find larvae present, the site is treated with chemical or biological controls. The applicator that performs the inspection determines what the best treatment practice should be and makes the appropriate applications. All inspection and treatment information is recorded digitally and stored in centralized databases. Each breeding site in the county is issued a 'Next Survey Date', which is determined by the length of time the applied treatment will be effective on the mosquito larvae found in the pond.

Important pond mosquitoes in Ada County are *Anopheles freeborni*, *Coquillettidia perturbans*, *Culiseta inornata*, *Culex pipiens*, and *Culex tarsalis*. Most pond mosquitoes lay raft-like egg masses; the exception is the genus *Anopheles*, which lays eggs singly, directly on the water's surface. Pond mosquitoes typically overwinter as adults in dark sheltered areas such as animal burrows, man-made shelters, basements, etc. When they begin flying in the spring, they lay their eggs and when conditions are ideal eggs can develop into adults in 7-14 days.

Pond mosquito breeding sites are variable. Pond mosquitoes generally lay a single brood, but are more commonly known to be multi-brooded (meaning they can lay several egg raft masses throughout their life cycle). Some species stay very close, within 1 mile, of their breeding site, while others will travel great distances (*Culex tarsalis* have been found to travel up to 15 miles from a breeding source). Pond mosquito populations usually start small and then increase over the mosquito season. They are usually most active between dusk and dawn, at the same time that human populations are more active during the summer months. Some pond mosquito species have the potential to carry diseases, such as malaria and West Nile virus. Due to this, we are particularly concerned with the control of pond mosquitoes and a large program focus is placed on larvaciding and surveillance in these areas.

Due to the large number of these species trapped in 2009 we have decided to increase the number of field personnel next year in order to locate more breeding sites and treat them to reduce the numbers of mosquitoes hatching into adults.

Management of Larval Stage Floodwater Mosquitoes

Floodwater mosquitoes typically hatch as a result of flooding. For example, snowmelt, irrigation of pastures or residential yards. Fields and pastures usually have numerous depressions that can breed floodwater mosquitoes. These areas are not mapped or monitored as they are too difficult to specifically locate. Unlike the pond mosquitoes, floodwater mosquito's reproduce only when a flood event occurs, either naturally or artificially through irrigation.

Mosquito traps can be set in flood mosquito areas, but may not catch any mosquitoes until flooding occurs. Typically, floodwater mosquitoes are not treated with larvacides because of the large number of very small sites over vast areas. Large areas require large amounts of product and are cost prohibitive

Important flood water species found in Ada County are *Aedes vexans*, *Ochlerotatus dorsalis*, *Ochlerotatus nigromaculis*, *Ochlerotatus sticticus*, *Ochlerotatus flavescens*, *Ochlerotatus increpitus*, and *Ochlerotatus sierrensis*. Flood water mosquitoes typically lay eggs singly on damp soil above the water level. These mosquitoes can overwinter as eggs, and when flooding occurs and the temperatures are warm, they can hatch within minutes or days. A floodwater mosquito egg can survive for years, (*Aedes vexans* eggs can survive up to 3 years) until a flood event occurs.

Flood water mosquitoes may deposit eggs once, or multiple times through their life cycle, and have been known to migrate large distances. They are usually active during the day, swarming in the shade, and from dusk into the early evening. These species are known to be vicious biters and swarms of certain species (such as *Ochlerotatus nigromaculis*) can make human activities come to a standstill.

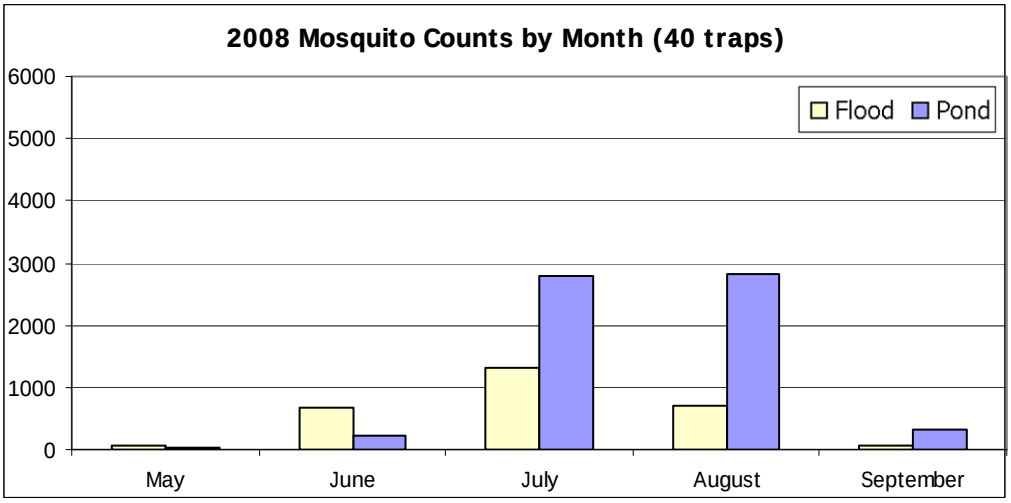
Trapping and Surveillance

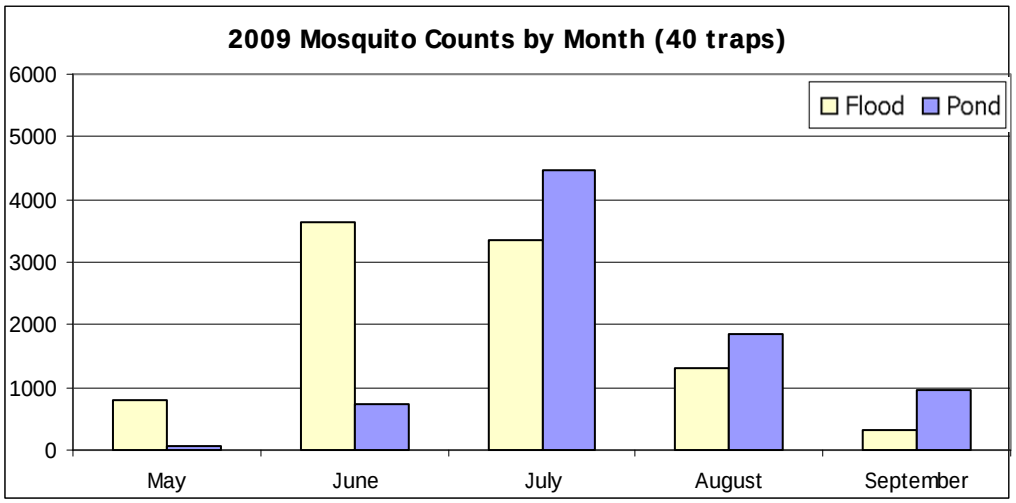
The abrupt introduction of West Nile virus to Idaho in 2006 necessitated an emergency declaration for public health reasons, and demonstrated the importance of having a mosquito surveillance program in place. An effective program will aid in predicting emergency situations, allowing an opportunity for vector management to intercede before a situation becomes critical. The ACMAD routinely uses Center for Disease Control and Prevention (CDC) traps baited with carbon dioxide to monitor mosquito numbers and species. Once per week, a trap is set at each location in the evening (Monday through Thursday) between the hours of 7 and 11 pm. The next morning, all set traps are collected between the hours of 5 and 9 am. The contents of each trap are sorted, and all mosquitoes collected are counted by species (Figure 2). These data are entered into a database and compared with historical records to provide the context of the current mosquito season and to help plan necessary control efforts. The mosquito species that are competent vectors for disease (in the case of WNv this would include *Culex spp.*) are sorted and separated into pools containing 50 mosquitoes or less. These mosquito pools are tested for WNv using Rapid Analyte Measurement Platform (RAMP) equipment at ACMAD. Sample results exceeding state defined thresholds are automatically considered WNv Positive. If a sample returns a value less than the states defined threshold, they are considered 'temporarily positive for WNv' and are sent to the Idaho Bureau of Laboratories for more in depth disease sampling and final confirmation.

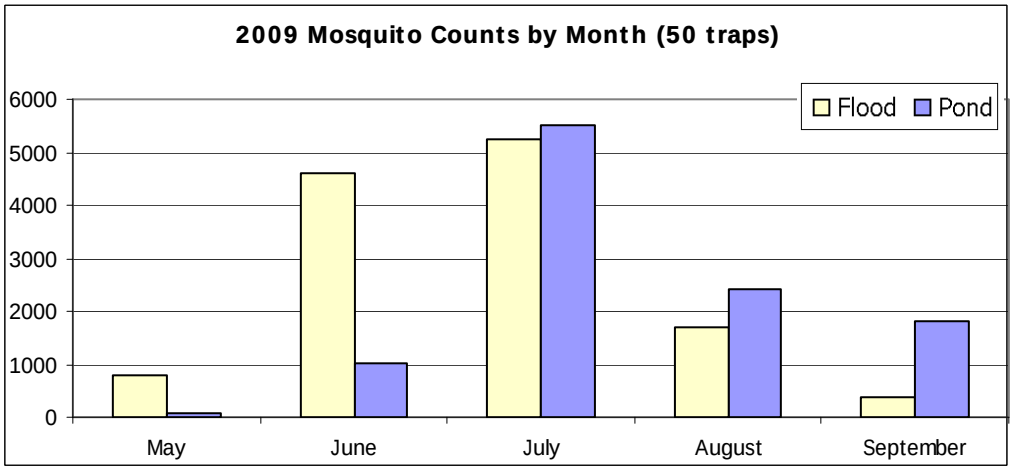
These surveillance practices were designed as proactive measures to locate areas of disease concentration. Additionally, an ecologist was added to the ACMAD staff in 2007 to help facilitate the surveillance process. Historically, up to twenty trapping sites had been utilized across Ada County. In 2007, the number of trap sites was increased to 40, setting and picking up 10 traps per night (Monday – Thursday). These changes increased the amount of information available to help determine and address problems before they reach endemic proportions. Expanded trapping resulted in the discovery of a new mosquito species, *Ochlerotatus sierrensis*; which had not previously been identified in Ada County. The greatest advantage of these changes has resulted in a more effective adulticiding program which enables ACMAD to determine when to apply what product and intensify our control efforts when required. Increased data also provides a clearer understanding of when large scale aerial applications are necessary.

In 2009 we increased our trap numbers to 50 traps per week (10-14 traps per night; Monday evening through Thursday), allowing for analysis Tuesday through Friday. Currently, the traps are located where there are higher populations of *Culex* species. The purpose of the 10 new trap locations was to not only increase *Culex* species observations, but increase the surveillance of developing floodwater mosquito populations in areas where floodwater mosquitoes are known to be prevalent.

The same 50 trap locations will be used in 2010 as our results in the previous year convinced us we had saturated the area, and will continue to give us good data on mosquito populations in the District.







Mapping and Monitoring

ACMAD maintains a Geographic Information System (GIS) that contains a digital inventory of all known pond breeding sites. When sites are found they are mapped using Global Positioning Systems (GPS) technology. Office digital processes automatically manage site inspection requirements (determined by NSD) and applicator area assignments. Maps and reports can be printed on the fly for field crews or team leaders as needed, and field crews have current digital maps on PDAs with them in the field at all times.

Acknowledgements

Information on mosquito species and their biology was compiled from the following text and is used with the permission of Donald R. Brothers, author of "Mosquitoes of Idaho: An Introductory Guide to Understanding Them, Their Importance, and the Control Process." This publication is available in Ada County libraries or on the Internet at www.idahoparks.org/assets/contents/docs/Mosquitoes_of_Idaho.pdf.

Appendices

Appendix 1: Sample Field Application Report

Ada County Weed Control

Field Application Record

Work Order Summary

Work Order ID: 32239 Parcel: R530277003 Status: C ComplaintID: 0 Created By: Rebecca Wood Date: 2009-11-10

Notes RESIDUAL APPLICATION CALL BEFORE 850-2434

Location: 2160 LANARK

Client Summary

Client ID: 1602 Name: GOADE EXCAVATION JOHN GOADE Taxable? Y Phone: 2082884320

Address: 2647 N SILVERLEAF MERIDIAN 836420000 Alt Phone: 2088502434

Product Recommendation Record

Target Weed: Puncturevine Product Recommendation By: Loren Brackett (31952)

Product	EPA #	Application Rate	Price	Cost
Functionality To Come				

Application Summary

Lead Applicator: Craig T. Whitted Application Date: 2009-11-13 Start Time: 09.00.00 Total Time: 0.5 hrs

Start Gallons: 140 End Gallons: 40 Acres: 2 Gal/Acre: 50

Wind Speed: 5 mph Wind Direction: 90 Temperature (F): 35

Application Notes: ; Contacted JOHN on 2009-11-13 9:00<target rate override by WO_APP><target rate override by WO_APP>

Product	EPA #	Application Rate	Quantity	Price	Cost	Accounting Use Only
Labor - Weed Extra Man	N/A	1	0.5 HR	$19.25	$9.62	
Labor - 1Man 1Mach	N/A	1	0.5 HR	$64	$32	
EDT	N/A	1	2 PT	$1.71	$3.42	
Diuron 4L	N/A	10	20 QT	$5.8	$116	
				Sub-Total: $	161.04	Total:

Applicator Signatures

CRAIG T WHITTED Digitally signed by CRAIG T WHITTED DN: cn=CRAIG T WHITTED, o=WEED PEST MOSQUITO, ou=ADA COUNTY, email=cwhitted@adaweb.net, c=US Date: 2009.11.13 09:49:07 -07'00'

Doug Morrow Digitally signed by Doug Morrow DN: cn=Doug Morrow, o=Weed Pest Mosquito, ou=Ada County, email=dmorrow@adaweb.net, c=US Date: 2009.11.13 09:49:50 -07'00'

Craig T. Whitted (41913) - Lead Doug Morrow (50391) - Applicator

By signing this document, the applicator asserts that they have reviewed this record and have confirmed that the information is accurate to the best of their ability.

Office Use Only:

Supervisor Notes:

Supervisor Approved: _____ on ___/___/_____

Accounting Approved: _____ on ___/___/_____ Field UID: I32239091113090200

Invoice #

Ada County Weed Pest and Mosquito Abatement

975 E Pine Ave, Meridian, ID 83642. Ph: 208-577-4646. Fx: 208-577-4631

Document Created On 11/13/2009 at 9:48:05 AM

Appendix 2: Sample Office Application Report

Ada County Weed Control Workorder Report

Ada County WPM; 975 E Pine Ave, Meridian, ID 83642

Work Order Information

Work Order Number: 32177 Created By: Bryan Dallolio Referred To: Doug Morrow Status: Closed

Creation Date: 10/30/2009 Completion Date: 11/2/2009 Target Species: W Target Location: Non Crop

Location: 4750 S. Henry st. B. Treat the North edge of the property, for ST + CT Check elsewhere on prop for ST also.

Notes: Est. $75.00 L + Ch.

Client: HENRY STREET PROPERTIES LLC 4750 S HENRY ST , BOISE , ID 83705

Phone Number: 322700 Call First?: No

Application Information

Invoice ID: 65567 Invoice Date: 11/2/2009 Invoice Status: Paid Application Weather: 35 °F Wind 4 mph at 315 °

Application Notes:

Application Date: 11/2/2009 Time In: 9:00:00 AM Time Out: 9:30:00 AM Total Time: 0.50 hours Acres Treated: 1

Start Gallons: 25.00 End Gallons: 0.00 Gallons/Acre: 25.00

Product Name	EPA Reg #	Quantity	Rate	Price	Cost
TAX CHARGE		0	0 / Acre	$0	$1.48
EDT	n/a	0.5 PT	0.5 PT / Acre	$1.71	$0.86
MILESTONE	62719-519	7 OZ	7 OZ / Acre	$2.85	$19.95
PHASE	n/a	1 PT	1 PT / Acre	$3.85	$3.85
LABOR - 1MAN 1MACH		0.5 HR	0.5 HR / Acre	$64	$32
LABOR - WEED EXTRA MAN		0.5 HR	0.5 HR / Acre	$19.25	$9.62

Total: $ 67.76

Applicators

Person Recommending Application: Bryan Dallolio

Name	Role	License No.
Winton Lambert	Driver	29899
Doug Morrow	Lead	50391

Site Photo

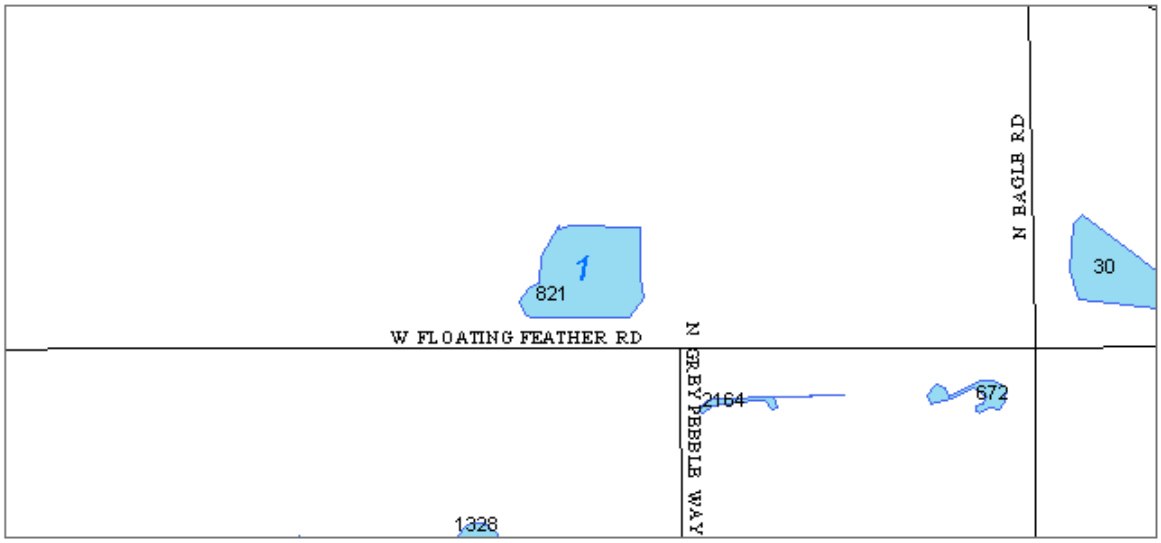
No Photo To Display

Site Map

Created at Ada County WPM by wpdillpj at 1/6/2010 4:18:33 PM

Appendix 3: Sample Mosquito Site History Summary

Ada County Mosquito Site History Reports



Site history for 821

***** Site Inspections *****

Date	Time	UID	Dry	# Dips	Avg Cnt	Max Cnt	Stages Found	Treated	NSD
5/29/2009	9:37:	83	No	3	1-10	1-10	I1, I2, I3,	True	6/22/2009
Treatment: 36 units of AQUABAK200 over 10000 square feet									
4/17/2009	10:39	83	No	3	0	0	None	True	5/11/2009
7/15/2009	9:37	83	False	3	1-10	1-10	I1, I2,	True	8/10/2009
Treatment: 54 units of AQUABAK200 over 15000 square feet									
Treatment: 54 units of ALTSD XRG over 15000 square feet									
6/23/2009	11:48	83	False	3	1-10	1-10	I1, I2, I3,	True	7/6/2009
Treatment: 90 units of AQUABAK200 over 25000 square feet									
8/12/2009	7:37:	83	False	3	1-10	1-10	I1, I2,	True	8/31/2009
Treatment: 36 units of ALTSD XRG over 10000 square feet									
Treatment: 36 units of AQUABAK200 over 10000 square feet									
5/11/2009	1:45:	83	No	3	1-10	1-10	I2, I3,	True	5/25/2009
Treatment: 43.2 units of ALTSD XRG over 12000 square feet									
9/3/2009	10:59	83	False	3	0	0	None	True	9/21/2009
Treatment: 18 units of AQUABAK200 over 5000 square feet									