CONSERVATION AERONAUTICS

Volume 2, Issue 4 AUGUST 15, 1999

DEDICATED TO PERPETUATING AN ECONOMICAL AND EFFICIENT PROGRAM IN RESOURCE MANAGEMENT AVIATION

ASSOCIATION OBJECTIVES:

A. To promote the recognition of the impor tance of sound aviation practices in re source management, with safety as the paramount factor.

B. To encourage and develop the educational, social, and economic interests of aviation in resource management.

C. To exchange information on operational techniques and procedures.

D. To utilize member experiences to develop and distribute reference materials of aviation interest to the Association.

E. To coordinate, research, and promote new techniques and equipment.

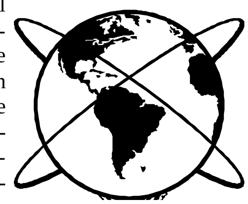
F. To take all action necessary to further the use of aircraft in natural resource management.

In this issue:

INTERNET FORUM

Con-Aero List

John Clem, Treasurer



CON-AERO is an electronic-mail discussion list for members of the International Association Of Natural Resource Pilots (IANRP) and others interested in aviation applications for natural resource conservation. This list will serve to exchange information about IANRP activities, and for discussion of aircraft applications for natural resource monitoring, research, management, and regulation enforcement. There is no charge for a subscription.

Participation in an electronic mail discussion group requires a computer and an electronic mail account. Virtually any type or vintage of computer will suffice, and electronic mail accounts are available free. Many government agencies already have e-mail for their employees. If you need your own account, it can be obtained through most public libraries by connecting your computer to their computer from your home through a telephone. The other free method is to utilize an e-mail company that provides the service at no cost in exchange for reading their advertisements. If you need more specific information about these services please contact the treasurer.

A discussion list is an automatic distributor of electronic mail. The distributor for the Con-Aero list is a computer at the University of North Dakota. When someone sends an e-mail message to Con-Aero, the message is then transmitted to each person subscribed to the list. So, if you have a question relating to natural resource aviation or an idea to share with others in this field, address your message to:
Con-Aero@aero.und.edu

This mailing list and others are maintained by the Majordomo mailing list management system. Majordomo is an automated system which allows users to subscribe and unsubscribe to mailing lists, and to retrieve files from list archives. To subscribe to this service, send the following e-mail message to **Majordomo@aero.und.edu**:

lists
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SURVEY TECHNIQUES

Eel River Basin Project

California Department of Fish and Game.

The follow article is a synopsis of a presentation made at the 1996 Watershed Management Council Conference in Crystal Bay, California:

Resource managers need accurate, timely, and affordable stream and watershed information to support recovery and enhancement efforts. In response, the California Department of Fish and Game (DFG) video graphed the mainstem of the Eel River and mainstems of its major tributaries during the summer of 1993, The goal was to record aerial reconnaissance of fish habitat in main stems and to estimate erosion hazards and other watershed disturbance in minor tributaries. The two overall objectives of this project were first, to obtain and record a first-hand impression of current conditions for anadromous fish spawning and migration in the major sub basins of the Eel system, and second, to develop methods of capturing expert observations in a way that would enable their cataloging, mapping, and dissemination with more efficiency than person-to-person and/or conventional text reports

The project was accomplished with a DFG Patenavia (P68) and a crew consisting of a pilot, two observers, and a camcorder operator. The aircraft was flown at 1,500 to 3,500 feet above ground level. The camcorder recorded near-vertical terrain imagery and the observer's narrative, including stream names and codes, fish habitat descriptions, locations of landslides, etc. Verbal time announcements on the tape were correlated to UTC time and GPS position records to estimate the location of selected imagery and narrative sequences. The project encompassed over 640 miles of stream channel, and over five hours of narrative during the course of four flights. Video image sharpness and color quality were sufficient for identifying large, main channel pools, sand and gravel bars, and other large features within about 600 feet of stream banks. Highways, landslides, and downed trees were visible with good detail.

Partenavia P68

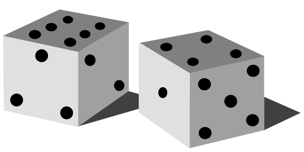
Before each flight the observers briefed the pilot and camcorder operator on the overall mission objective as well as proposed routes and sequences of river segments to be flown. The observers synchronized their wristwatches to GPS time, obtained from a GPS receiver, which recorded the entire flight at a rate of one position per second. Two-way voice communication among all crewmembers was maintained with headsets and microphones. An additional microphone connected only to the camcorder was attached to the headset microphone of the front observer, enabling the recording of reconnaissance narrative in conjunction with the terrain imagery. Incidental information in the front observer's crew conversations was recorded as well.

(Continued on page 2)

BROKEN WING AWARD

If It Weren't For Bad Luck ...

By Dave Younkin, President



On June 10th one of Colorado Division of Wildlife Cessna185s was involved in the following incident: Whitey Wanamacher was conducting a telemetry search for one of Colorado's newly transplanted lynxes. At about mid-day he and an observer landed at Farmington, New Mexico for fuel and lunch. Upon departure at about 1:00 in the afternoon., at an altitude of approximately 700 feet agl, and about three miles from the airport, the engine lost power to the extent that it could only maintain a high idle. Whitey immediately attempted to return to Farmington and realized he could not. So he selected an open Mesa, and effected a successful emergency landing in a very small area.

Mechanics from Farmington were sent to the area by the tower (since he had been in continuous contact with them). They determined that the bolt that holds the throttle arm to the throttle body was missing. It was replaced, and the aircraft checked out normally. This bolt normally is held in place by a castellated nut and secured by a cotter pin.

After a careful inspection of the area a take-off was made. Just at the point of lift-off the left main gear contacted a small berm, and separated it from the aircraft. The flight was continued to the Farmington airport where a successful one-gear, one wing tip, landing was made. Damage to the aircraft will run around $20,000. In order to inspect the separated linkage a person would have to uncowl the aircraft, a chore not expected of the pilot. The conclusion is that either there was a catastrophic failure of the bolt or the retaining key, or last but not least, that the pin was improperly placed.

We extend this caution to the membership: We all fly in hostile areas where such a problem might be catastrophic. Let us not be complacent about flying any lower or slower than necessary to accomplish our mission, even when ferrying to a job site. Let us not become complacent about reminding our maintenance facilities that our well being depends upon their skill and dedication. A lot of the flying we do becomes routine and even boring, but we must not become complacent. We must remember that those people in the air with us are counting on us not to be careless, sloppy, or complacent, but instead to be vigilant. Whitey displayed an excellent job of airmanship, and should be commended for it.

(EEL RIVER BASIN Continued from page 1)

The voice recording was also the medium through which aircraft position, aircraft altitude, and camcorder zoom lens, and shutter speed settings were recorded. To mark an approximate position in the course of a flight recording, the front observer would read aloud the time on his wristwatch, to be recorded on the videotape. During tape playback, any such "spoken time" would be correlated with GPS time included with each GPS position, thus locating (within a few seconds in time and a few hundred meters in space) any particular video imagery and/or observer comments. Flight altitude was read aloud by the front observer directly from the aircraft's altimeter, while camcorder settings and status were relayed by the operator through the aircraft intercom. Additional location references were voiced onto the videotape in the form of place names, numbered waypoints (noted concurrently by the second observer operating a LORAN receiver), and stream name codes.

High terrain in close proximity to the subject streams necessitated the flying of a continuous, meandering flight path to follow stream channels. The camcorder, positioned over a factory-installed camera port, mounted on a simple gimbal, was panned by hand from side to side to keep the stream channel centered in an external monitor. While image blurring and distortion were introduced by this technique, the minor losses of image quality were exchanged for greatly increased rates of coverage. An additional advantage of the camera panning was the ability to track an image fore-to-aft, greatly reducing image forward-motion in effect "freezing" an image for several seconds.

GPS positions were collected at the rate of one position per second and were differentially corrected after the flight with base station files downloaded from the U.S. Forest Service's Remote Sensing Lab in Sacramento. The precision of aircraft positions, estimated at 2 to 5 meters after correction, was more than adequate given the variable camcorder zoom lens settings and pointing direction.

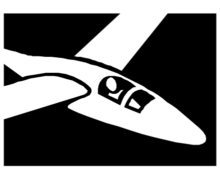
Aerial video data, when integrated with UTC time code, GPS positioning, and expert narrative, can be a valuable supplementary information source for DFG field biologists, OSPR operations, fish habitat restoration managers, special-status species consultants, and other Department cooperators. Video imagery of streams and other natural resources, even at marginal levels of technical quality, can yield significant rates of information delivery in support of management decisions. Videography in general appears to have needed qualities of large capacity, archival storage, available, affordable technology, media integration, and user acceptability that can drive improved expert information cataloging, mapping, and dissemination.

Details of this project have been posted to the IANRP web page in the Operations Forum Chapter.

SAFETY CORNER

Down and Out...

Dennis E. Dura, D.P.E.



In the event of an engine failure a Natural Resource Pilot needs to know how far the aircraft will glide, and in some cases, how long the aircraft can stay aloft. For an airplane or helicopter, the L/D ratio determines glide distance. Gross weight affects the amount of time an aircraft glides, and the maximum-glide-distance airspeed for an airplane and helicopter. Any configuration change that increases drag, such as flaps on an airplane or external stores on a helicopter or airplane, will adversely affect the L/D ratio. The maximum-glide-distance airspeed is usually only published for the maximum gross weight of an aircraft. As an aircraft gets lighter, that airspeed decreases. A rule of thumb is that airspeed decreases 5% for every 10% decrease in gross weight. It is important to maintain that airspeed in order to glide at the minimum glide angle. A pilot can not stretch the gliding distance above or below the optimum glide angle. If a pilot glides at a steeper angle, less distance will be covered. If a pilot raises the nose of an airplane in an attempt to obtain a shallower glide angle to extend the glide, the angle of attack is increased. This increase in angle of attack will increase lift, but induced drag will also increase and the airspeed will decrease, resulting in less gliding distance.

Raising the nose of a helicopter will change the angle of airflow through the main rotor, increasing drag and reducing airspeed. Usually the maximum glide distance for a helicopter is achieved in the lower portion of the rotor rpm operating range. This is due to the decrease in induced drag affecting the main rotor at lower rpm settings. Remember that a head wind will decrease the gliding distance, and a tail wind will increase it. Sometimes a pilot may need to stay aloft as long as possible and would like to obtain the minimum sink rate airspeed. The minimum rate of descent airspeed in autorotation is published for all helicopters.

For an airplane, a little educated guess work is needed. If one looks at a graph of "rate of descent" versus "airspeed" for an airplane in powered off flight, the minimum rate of descent airspeed falls between the power off stall speed and the maximum glide airspeed. It is probably some where between 5 to 10 knots above stall speed. But to be more accurate, you might consider taking your airplane out some day and do a little experimenting to determine what the minimum rate of descent airspeed actually is for your airplane in a glide.

Natural Resource Pilots are involved in many flights over inhospitable terrain, and it would be wise to be aware of all our options if the engine quits.

<u>IANRP WEB PAGE</u>

The IANRP Web Page is now on line. The formal address is:
http://IANRP.org

<u>We need your help!</u>

We need articles about your flying program. We also need articles about specific activities you may undertake, such as the Eel River Basin Project. We also need information about upcoming events. If you have any information you would like to see published, please send it to the newsletter editor. Include photopgraphs and text (about one typed page).

PRODUCT REVIEW

The Found Bush Hawk

Edited by Pete Hobstetter

Found Bush Hawk in Flight

The original FBA-2C was designed and manufactured by Found Brothers Aviation Limited in Toronto, to operate on wheels, skis, and floats in undeveloped regions, such as Canadian bush country. The aircraft was certified to FAA CAR 3 regulations in Canada and the United States, to operate on retractable wheel skis and wheel floats. The prototype flew successfully in 1959 with a tricycle configuration, but the -2C incorporated the optional tail down configuration. Twenty seven were sold and nine are still registered.

In 35 years of operation the FBA-2C has become a legend with its owners. It has earned the reputation of being a durable and reliable aircraft, with excellent take-off and climb capability, along with stable flight characteristics and exceptional handling qualities in high-wind, rough-water conditions.

Cargo Door Access

One FBA-2C is owned by Tudhope Airways Limited in Hudson in Northern Ontario. Operating on skis and floats in the harsh conditions encountered in those remote regions, it has accumulated, safely and economically, over 13,000 hours and over 58,000 flight cycles (take-off / landing) without any sign of airframe deterioration or requirement for a major overhaul. Many more years of operation are planned.

The aircraft is preferred by Tudhope customers, and it continually returns high profits due to the bulky loads it carries in the 42" wide, 120 cubic-foot cabin, and the low operating costs which are approximately 55% of a comparable aircraft. Cabin access through four large doors facilitates loading such items as forty five imperial gallon fuel drums, automatic washers-dryers, ten-foot lumber, or a stretcher with patient.

The “Bush Hawk” is an improved version of the Found FBA-2C, and is being produced in response to compelling requests to place the FBA-2C back into production. The original Type Certificate of the FBA-2C in Canada and the United States has been reinstated. This has saved several million dollars in costs which would have been needed to certify a new aircraft.

The “Bush Hawk” carries approximately 70% of a Beaver load and incorporates several modifications, including: larger rear doors for easier access to the rear cabin, increased gross weight from 3,000 to 3,200 lbs, increased disposable load to 1200 lbs on Edo 2960 floats, increased power with a fuel injected engine, reduced drag, increased ASI and rate of climb, fail-safe design of critical components, and an increased fuel capacity (83 Imp gal/100 US gal).

The “Bush Hawk” is being built by Found Aircraft Canada Inc, near Toronto, Canada. The first production model, which will be available early 1999, will utilize a tail-down undercarriage configuration. A tricycle version will be available on subsequent models. For more information contact: Found Aircraft Canada Inc, 300 Jones Road, Gravenhurst, Ontario, P1P 1A1.
Telephone (705) 687-6167.

Engine	Left Impulse Magneto	260 HP Lycoming IO-540-D4A5		Total Cabin Volume	120 Cubic Feet
Propeller	Hartzell Three Blade	Diameter 84 Inches		Rear Cabin Volume	87 Cubic Feet
Wing Span		36 Feet		Fuel Capacity	83 Imperial/100 US Gallons
Wing Area		180 Square Feet		Main Wheel Size	8.00 X 6
Length		25.5 Feet			

Option	**Description**	**Model #**		**Disposable Load**	**Gross Weight**
Wheels				1450 lbs	3200 lbs
Floats	EDO Straight	#2960		1200 lbs	3200 lbs
	EDO Amphibian	#2790		900 lbs	3100 lbs
Skis	Federal Retractable	C-3200		1335 lbs	3200 lbs

PERFORMANCE		Wheel Version	Float Version
Horsepower		260 HP	260 HP
Gross Weight		3200 lbs	3290 lbs
Sea Level ISA @ Max Continuous Power	Maximum Speed	139 knots	121 knots
	Rate of Climb	931 fpm	750 fpm
5000 IAS @ 75% Power	Cruise	132 knots	112 knots
	Fuel Flow Imperial Gallons/US Gallons	11.9/14.3 gph	11.9/14.3 gph
Specific Range	N.A.M. Per Fuel Pound	1.5 miles	1.4 miles
5000 IAS @ 60% Power	Cruise	119 knots	106 knots
	Fuel Flow Imperial Gallons/US Gallons	9.6 /11.5 gph	9.6/11.5 gph
Specific Range	N.A.M. Per Fuel Pound	1.6 miles	1.5 miles

Bush Hawk Update!

The Found Bush Hawk has achieved full Canadian certification. An application has been made to the Federal Aviation Administration for reinstatement of certification. Flight testing of a 300-horsepower version of the aircraft should be completed this fall. Preliminary indications are that aircraft performance will increase substantially. Speed should increase about 7% and rate-of-climb by 25%!. We will keep you posted on the IANRP Web Page.

Con Aero Newsletter

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2000 IANRP WORKSHOP
Cajun Convention!
Forwarded by Tom Monterestelli, OAS

The IANRP 2000 Workshop will be held in New Orleans, Louisiana at the Le Pavillion Hotel from January 31 through February 4, 2000. A precise agenda is yet to be established, and we are looking for IANRP members who could and would make a contribution in the way of a talk or slide presentation, or movie or comedy act or anything else of passing interest. For those members who have access to the internet, updated information can be found on the **www.oas.gov.ace** symposium.

I herewith petition the Executive Committee of the International Association of Natural Resource Pilots for Membership.

Name ____________________

Department ____________ Title ____________

Address ____________________

City ____________ State/Province ______ Zip ______

Work Phone ( ) ____________ H ome Phone ( ) ____________

Fax ( ) ____________ E -Mail ____________

Signature ____________________

This is a : ☐ Renewal ☐ Original Membership (Check One)
☐ Full Member ☐ Associate member (Check One)

MAIL TO: IANRP Treasurer
9740 Briarwood Drive
Plain City, Ohio 45064

(Please enclose $20 membership fee)

Calendar of Events

08/28/99	Rochester Int'l Air Show Rochester, New York.
09/24/99	White-Tailed Deer Conference Harrisburg, Pennsylvania
09/28/99	FAA International Aviation Training Symposium Oklahoma City, Oklahoma.
10/24/99	Microcomputer Applications in Fish & Wildlife Stateline, Nevada.
11/02/99	FWS GIS National Workshop Phoenix, Arizona.
01/31/00	IANRP Workshop 2000 New Orleans, Louisiana

See *Details on the IANRP Web Page*

CLASSIFIED ADVERTISEMENTS

POSITION WANTED: PILOT/BIOLOGIST
Stephen D. Earsom
Licenses/ratings: Com'l and Instrument AS/MEL, CFI for ASE. Experience: 600+TT, 500+PIC, 200+ as CFI with a majority of experience obtained in mountains and deserts of New Mexico and Colorado. Will be receiving MS in Biology this fall from University of New Mexico. Read/write/speak Spanish. Contact:

Dept. of Biology
167 Castetter Hall
University of New Mexico
Albuquerque, NM 87131
(505)277-5130; Fax 277-0304

(Details available in the IANRP Web Page)

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