REHABILITATION WILDLIFE COUNCIL

WILDLIFE JOURNAL

Vol. 1 No. 3 Summer 1978

PESTICIDES & WILDLIFE

Since World War II there has been a rapid increase in the use of chemicals to control plant and animal "pests" until today the world uses about four billion pounds of insect, mite, rat and weed killer a year or about a pound for every person on earth. The efficacy of such a course has been disputed widely. One of the most recent findings by the United Nations Environmental Program is that more than 300 species of insects and mites can resist chemicals that once killed them. Among the diverse chemical agents used, two families of compounds are of most concern.

The organophosphate compounds include parathion, malathion, chlorthion, phosdrin, thimet, TEPP, and others. These poisons are inhibitors of the enzyme cholinesterase, important in the transmission of nerve impulses; in particular they block the normal function of synapses. If directly or indirectly ingested, an animal would display such symptoms as vomiting, staggering, seizures and possibly death. Sensitivity to their effects on nervous functions is shared by arthropod targets and vertebrates.

Organophosphates can cause wide-spread mortality of organisms other than the target species, and they can disturb the process of natural or biological control by killing the predators and parasites of various target species. Organophosphates are relatively unstable both in the environment and in tissues; they do not in general spread widely through the environment or accumulate in the environment or in tissues. The same is true of the carbamates (carbaryl or sevin and others), another group of compounds that act as cholinesterase inhibitors and are now in extensive use.

Of more serious concern are the chlorinated hydrocarbons or organochlorines. Some organochlorines are naturally produced by fungi and are effective antibiotics. Humans, however, are using megaquantities of the compounds in this group (DDT, chlordan, dieldrin, endrin, aldrin, heptachlor, toxaphene, lindane, mirex, and so on). These poisons combine severe toxicity to a wide range of organisms with relative chemical stability. Consequently, they accumulate in the environment and along food chains and, distributed by wind and water, they persist in the foods of higher vertebrates. Their effects on physiological processes are varied. DDT and its metabolites resist chemical breakdown by digestion or other physical processes. They are stored in the fatty tissues of birds and mammals; any excessive physical stress can get them circulating and could provide a lethal dose of the stored poisons. Interaction with polyunsaturated fatty acid metabolism could result in riboflavin deficiency.

While sufficient amounts of these toxins are lethal, sublethal amounts can have indirectly lethal effects. One effect upon reproduction is the reduction of estrogen levels due to induction of liver enzymes. This leads to miscarriage and failure to conceive. Investigations have found that DDT may significantly reduce antibody production by inhibitory action upon antibody producing cells. Antibody formation is the most important inhibitory factor in bacterial infections. The sup-

pression of the immune response may lead to activation of latent viral infections.

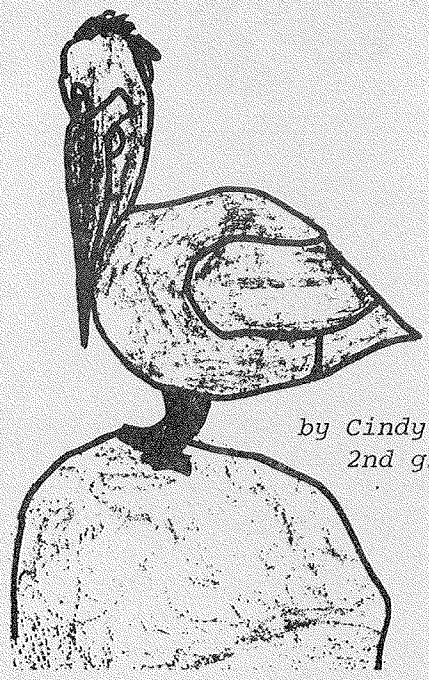
There is also evidence that conditioned responses are inhibited by DDT. Experiments using dieldrin and DDT in the feed of mallards caused the ducks to be depressed and passive or hyperexcited and aggressive respectively. Such impairments have the potential to drastically alter prey-predator relationships to favor either party.

A final major effect--the chemicals of crude oil have the property of blocking taste receptors and mimicking the natural stimuli inherent in behavioral responses of many marine organisms.

The implication that uncontrolled use of pesticides affects wildlife populations is obvious; the consequences grave. Persons involved with wildlife rehabilitation may not be able to control the use of these poisons but can minimize their effects by becoming familiar with the symptoms of pesticide poisoning. Making an accurate diagnosis is difficult and often impossible since no two animals will necessarily have the same symptoms nor will any one animal have all the symptoms common to a particular poison. The following chart should be helpful in making plausible diagnoses and in instituting appropriate and, hopefully, successful treatment.

Bibliography available upon request

by J.A. & M.W.



by Cindy Reinert
2nd grade

Wildlife Rehabilitation in Marin County:

THE MARIN WILDLIFE CENTER

This is the most recent name for what most people still refer to as the Boyd Museum or the Marin Museum of Natural Science. Organized in 1953 as the Junior Museum of Marin, our center is one of the few such organizations to move to an independent non-profit status. (That still doesn't excuse the myriad name changes!)

Since 1972 we have been involved in a fiery struggle to eliminate the "hands on" petting zoo mentality toward wildlife and replace it with an awareness of the problems facing wildlife and an attitude of respect for nature. We have been entirely successful in this venture. The change is reflected in our programming, facility, goals and new name.

The center is located in San Rafael, California. Housed within a 75 year old church, the wildlife clinic consists of four wards and a treatment room; an exhibit area and resource library are adjacent. The outside facility, about an acre of land, includes a 4,000 gallon cement pool for aquatic birds and mammals, ten aviaries of various sizes and eight mammal cages.

Approximately 2,000 animals receive care at the clinic each year. Ten local veterinarians assist in difficult cases and two full time wildlife directors oversee operations. We make every effort to keep wild animals wild so that they will have a better chance for survival when released.

The success of our organization is based upon the fact that over sixty trained volunteers actively work in education, fund raising and wildlife care.

We work cooperatively with local environmental groups and have the backing of the community. By their support they demonstrate their belief that caring for individual wild animals and instilling respect for the natural world through education are companions to the efforts to save wildlife habitat, populations and species.

by Martha Williams, Director of Wildlife, MWC

PESTICIDE SYMPTOM A' TREATMENT CHART

PESTICIDE	SYMPTOM	TREATMENT
Anticoagulants Coumarin	Hemorrhage and sudden death without previous warning. Anemia, weakness, pale mucous membranes, dyspnea (difficulty breathing), bloody feces, scleral and conjunctival hemorrhage, staggering, ataxia, blood-tinged froth from mouth and nose.	Sedation to prevent trauma, well ventilated cage, oral vitamin K, warmth
Arsenic-- Organic & inorganic	Acute: intense abdominal pain, staggering, extreme weakness, trembling, salivation, vomiting, diarrhea, fast feeble pulse, normal to subnormal temperature, collapse, and death. Subacute: anorexia, diarrhea, frequent urination followed by anuria, partial paralysis of hind limbs, stupor, subnormal temperature, and death.	BAL(dimercaprol) I.M. three times a day until recovery. Supportive therapy for additional signs, such as dehydration. May also need antibiotics.
Carbamates	Acetylcholinesterase depression, hypersalivation, diarrhea, vomiting, sweating, dyspnea, cyanosis, muscle twitching, seizures. Death is usually a result of hypoxia due to bronchoconstriction.	Atropine (0.5 mg./kg.) Valium for convulsions (watch respirations). Saline cathartic is recommended, especially for nonruminants.
Organochlorines	Hypersensitivity and spasms of eyelids and front quarters progressing to the hindquarters; these may be continuous or intermittent. Clonic-tonic seizures, loss of coorindation, circling, and abnormal posturing. Animal may become comatose.	Control convulsions with chloral hydrate or long lasting barbiturate. Supportive care.
Organophosphates	Hypersalivation, vomiting, diarrhea, sweating, dyspnea, cyanosis, muscle twitching (in extreme cases, tetany, followed by weakness and paralysis), convulsions. Death usually results from hypoxia due to bronchoconstriction. Extremely slow pulse in some cases.	Atropine (0.5 mg./kg.) Valium for treatment of convulsions (watch respirations). Saline cathartic is recommended, especially for nonruminants.
Metaldehyde-- Snail & slug killer	Muscle weakness, frothing at the mouth, hypersalivation, incoordination, fast pulse, loss of consciousness, cyanosis, and often convulsions. Death usually follows respiratory failure.	Supportive treatment for respiratory failure, glucose for treatment of possible liver damage, It is often necessary to anesthetize the animal to control convulsions.

Excerpted from "Pesticide Poisoning in Domestic Animals," Modern Veterinary Practice, Volume 58, Number 11, November 1977.

PROGRESS IN RABIES TREATMENT AND CONTROL



by Nicole Alley
2nd grade

Two new developments pertaining to the control and treatment of rabies offer hopeful signs for humans and animals alike.

One is a new rabies vaccine called "Interferon". It is derived from a virus grown in human cells and is much more potent than the current duck embryo vaccine. "Interferon" will be administered in five weekly injections in the shoulder of people exposed to rabies, as compared to the present 23 injections normally given in the stomach. It also has the benefit of not causing the adverse reactions some people have shown to the current vaccine.

Dr. William Winkler of the Center for Disease Control in Atlanta believes that a federal license will soon be issued for the new vaccine, thus making it available to the general public later this year.

The Center for Disease Control has also been working on an oral vaccine that may help eradicate rabies in wildlife populations. According to Dr. Winkler, the problem with the vaccine at this stage is that live-virus is the only vaccine that will immunize orally, and in using it, there is always the potential danger of actually causing the disease in other species. This, in fact, has happened in laboratory tests where rats were allowed to eat pieces of bait that were targeted for another species.

In spite of the problems, Dr. George Baer of the Center's Viral Zoonosis Branch says, "We think we are very, very close. Once we have this /new vaccine/ in the field, I feel it is the beginning of the end of terrestrial wildlife rabies." (Defenders of Wildlife, October, 1977)

Doctors Ed Bayer and Denny Constantine, rabies experts from the Veterinary Public Health Unit of the California Department of Health Services, point out that in 1977 there were 428 rabies positive animals in the state--245 skunks, 163 bats, 9 dogs, 3 cats, 3 foxes, 1 raccoon and 1 opossum.

They believe it is essential that all people who regularly handle animals--especially wildlife--should receive the rabies pre-exposure immunizations. It is a series of three to four injections using the duck embryo vaccine with a later blood test to be sure that an antibody response has developed. If it has, only one booster would be necessary after exposure to rabies. When "Interferon" goes on the market, it is probable that only one or two pre-exposure vaccinations will be necessary to build the virus-neutralizing antibodies.

The local offices of the California Department of Health Services offer these vaccinations free of charge, as do most health departments in other states. They have also published a booklet entitled "Guideline for Investigation of Animal Bites", which takes a thorough look at the rabies problem in California and includes sections on wildlife. Copies may be obtained by writing:

CA Department of Health Service
Veterinary Public Health Unit
2151 Berkeley Way
Berkeley, CA 94704

WRC CARESHEET UPDATE

WRC has currently embarked on a project to both update and produce some new wildlife care sheets. We are looking for interested people to serve on a committee to compile them. One may opt to participate in a specialty area or just on a particular paper or jump right in and help with all the papers. The committee will be establishing a format for these papers and all material used will be referenced as to the source.

Anyone interested in contributing information or participating in the compilation should contact Jan White at Wildlife Rehabilitation Service (707) 429-HAWK. Currently, the papers being worked on are deer, raccoon, and golden eagle. Any material you may have on these topics that you would like to see included should be mailed to WRS at 524 Delaware Street, Fairfield, CA 94533.

DID YOU KNOW?

If you think you work hard, consider this. Bussmann (1943) reported the mechanically recorded daily feedings of a nestful of six young European Nuthatches as follows:

days after hatching	feeding trips daily by parent
2	119
4	166
6	255
8	263
11	215
12	287
14	263
16	276
18	353
20	335
22	270
24	(leave nest)

CALIFORNIA LEGISLATIVE UPDATE

Bill	Author	
SB 1581	Holmdahl	Designates the bobcat as a fully protected mammal.
SB 1480	Nejedly	Prohibits the use of denning in predator control.
SB 490	Roberti	Prohibits the showing of any movie in which it has been proven that an animal was killed or injured solely for the purpose of making the film.
AB 2840	Mello	Makes it unlawful to capture, possess or confine any live cat except the house cat.
AB 3146	Boatwright	Licenses fur buyers. Requires them to report to Fish and Game on the numbers and species of pelts bought, including the name, address and trapping license number of the seller.
AB 3165	Mello	Will require animal shelters that release animals for research to advise the citizen surrendering the animal in writing that it may be used for research. Limits the use of pound animals in laboratories to one experiment.
AB 3416	Gualco	Funds Fish and Game's non-game programs through the General Fund.

BROOD PARASITISM IN COWBIRDS

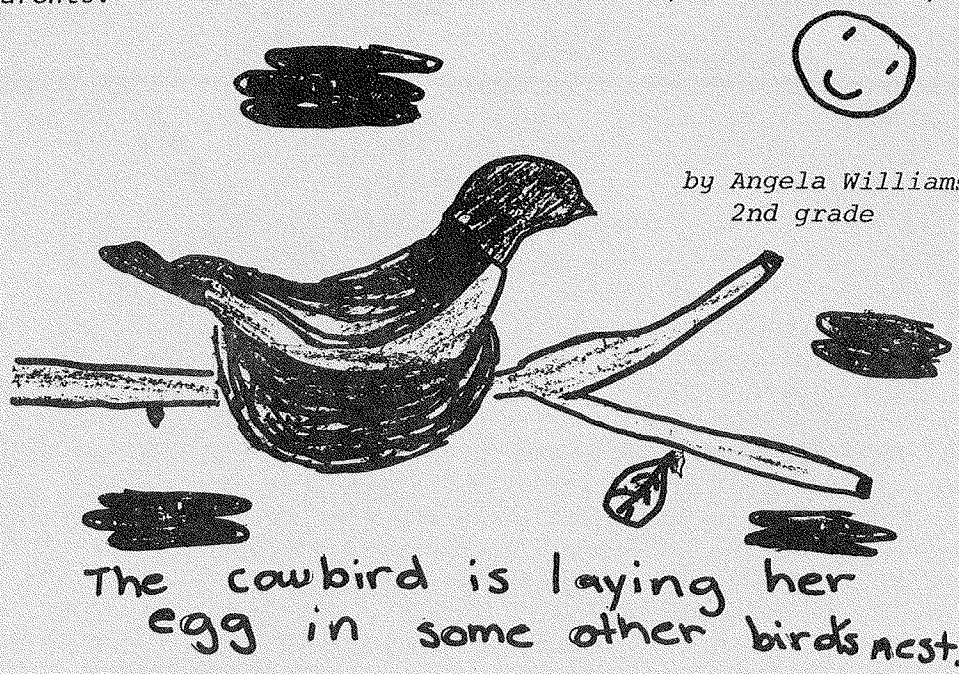
A substitution for the usual pattern of incubation in nesting birds, and one much lazier than that the incubator birds use, is brood parasitism or nest parasitism. This method involves an escape from the chief duties of raising a family--building the nest, incubating the eggs, and rearing the young--through the simple expedient of imposing them on another bird, usually one of another species.

This behavioral trait, a nasty and subversive one by human standards, but perfectly natural and biologically "moral" by avian standards, is practiced by representatives of five families: Anatidae, Cuculidae, Indicatoridae, Icteridae, and Ploceidae. Birds of various genera among these families lay eggs in nests of other species and abandon them to the care of their foster parents.

Cowbird does not evict its nest-mates; although in many cases it is larger and stronger than they are, and may crowd some or all of them from the next, or it may usurp the lion's share of food so that the host's young starve. One egg from the host's nest is removed by the female the day preceding the laying of her own shortly thereafter.

A favored host of the Cowbird is the Song Sparrow. One study showed that of the Cowbird eggs laid in Song Sparrow nests, 32% hatched and fledged, as against 36% of the Song Sparrow's.

There are several hypotheses for the origin of brood parasitism. It is possible that the loss of territorial defense, as seen among Cowbirds, may have led to loss of nest-building instincts and subsequently to brood parasitism. Many brood parasites



by Angela Williams
2nd grade

In North America the Brown-headed Cowbird, Molothrus ater, is a complete brood parasite. This familiar bird lays its eggs in the nest of over 250 other species of birds and abandons them to their host's care.

Although complete, the Cowbird is not particularly specialized for parasitism; i.e. it has not evolved races that specialize in parasitizing certain host species. Its eggs are of normal size and shell thickness and show no mimicry of the host's eggs. Cowbird's eggs, however, hatch with a day or two less incubation than the typical host's eggs. The young

are either polygamous or promiscuous, and such breeding habits tend to weaken the pair bond and territory defense by the male.

These weaknesses in turn create problems easily solved by brood parasitism. Another possiblity is simply a matter of timing. For example, a bird may be ready to lay its eggs before it finishes the nest and therefore lays them in another's nest--a plausible prelude to habitual and eventually instinctive brood parasitism. Whatever the origins, brood parasitism is a wide-spread, successful way of life for several species.

WILDLIFE ECO-SYSTEMS TO BE PRESERVED

How many of us have had the delightful privilege of observing a pristine salt marsh, teeming with a myriad of life forms?

How many more of us genuinely believe that our children's children will have a glimmer of hope for experiencing such a setting?

The Heritage Conservation and Recreation Service (HCRS), a board of combined agencies, has been funded by Congress to seek out, acquire and preserve such places--areas of national, natural heritage significance.

The HCRS has determined that sites to be considered must have:

--national, natural heritage value
--high wildlife value
--an imminent threat to its future
--private ownership
--no other agency management prospects

These sites will be called Wildlife Eco-Systems as directed by a 1977 amendment to the Land and Water Conservation Fund of 1965.

The U.S. Fish and Wildlife Service is concerned with the biological census of the potential areas for purchase. Their representative for California and Nevada is Bob Voeks. He will be meeting with all interested persons and visiting perspective sites until August.

If you or your organization has any sites that you think might qualify for this unique program, contact Mr. Voeks at:

(916) 484-4731 or
U.S. Fish & Wildlife Service
2800 Cottage Way, Room E-2740
Sacramento, CA 95825

CURRENT LITERATURE

The following is a list of current articles that may be helpful for those in various types of rehabilitation work. The periodicals mentioned are available at most universities, and single copies of each article are kept at the Marin Wildlife Center.

"The Barn Owl," Kale, H., The Florida Naturalist, Vol. 51, No. 1, Feb. 1978.

" Is the Harp Seal an Endangered Species?" Gorsline, T., Wildlife, Vol. 20, No. 3, March 1978.

"Accidental Exposure of Veterinary Students to Rabies," Russel, L., Journal of the American Veterinary Medical Association, Vol. 171, No. 11, Dec. 77.

"Mechanisms in the Pathogenesis of Diarrhea," Moon, H., Journal of the American Veterinary Medical Association, Vol. 172, No. 4, Feb. 78.

"The Food of Nestling Olivacious Cormorants," Morrison, M., The Southwestern Naturalist, Vol. 22, No. 3, June 15, 1977.

"Optimal Meal Size in Hummingbirds," DeBenedictis, P., The American Naturalist, Vol. 112, No. 984, Mar/Apr 1978.

WRC JULY MEETING

The next WRC meeting will be held on July 8th at the Alexander Lindsay Museum in Walnut Creek. Call (415) 935-1978 for directions. The Board Meeting will begin at 9:00 and the Regular Meeting at 10:30. Our guest speaker is Ken McCloud, reptile expert for the U.S. Fish and Wildlife Service. His topic: "Identification and Handling of Reptiles."

FREE COPIES OF "S.O.S." AVAILABLE

Single copies of Saving Oiled Seabirds are now available free of charge by writing:

The American Petroleum Institute
District Services
2101 L. Street, N.W.
Washington, D.C. 20037

The artwork used in this issue of the WILDLIFE JOURNAL was done by Barbara Nagata's second grade class at the George Hall School in San Mateo. Barbara is an accomplished wildlife artist herself.

THE FOLLOWING IS A LIST OF THE INFORMATIONAL LITERATURE AVAILABLE FROM WRC:

Copies may be ordered at a cost of 50¢ each, plus 50¢ for mailing the complete packet.

"Care & Feeding of Orphaned Birds"
"Raptor Care"
"Emergency Care of Birds & Squirrels
"Vector Born Disease Potential in Mammals"
"Care of Sick & Injured Birds"
"Gardening to Discourage Deer Damage"
"Care & Feeding of Bushtit Babies"
"Great Horned Owl Case Study"
"Necropsy Precautions & Procedures"
"WRC Wildlife Care Problem & Solution Paper #1"
"Care of Orphaned Raccoons"
"Care & feeding of Jack Rabbits"
"Cliff Swallows"
"Substitute Diet for Orphaned Birds"
"Substitues Diet for Orphaned Mammals"
"Care & Feeding of Orphaned or Abandoned Tree Squirrels."
"Water Turtle Care Sheet"
"Care & Feeding of Baby Doves & Pigeons" ($1.50)
"Avian Drugs & Dosages" by Dr. Galvin ($3.50)
"Raptor Care & Rehabilitation" ($6.00 for WRC members, $10.00 for non members)

WILDLIFE REHABILITATION COUNCIL APPLICATION (please print): Date:_____

Name:_____ Occupation:_____ Phone *(with area code)*:
Hm:_____
Wk:_____

Address:_____ City:_____ State:_____ Zip:_____

Organization:_____ Your Position_____

Membership: Associate ($7.50)___ Professional ($15)___ Organization ($25)___ Renewal____

Mail to: Wildlife Rehabilitation Council, P.O. Box 3007, Walnut Creek, CA 94598

REHABILITATION
WILDLIFE
COUNCIL

P.O. BOX 3007
WALNUT CREEK, CA 94598